

Primary Prevention of Lung Cancer in Appalachia through State and Local Policy Change

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Lung cancer is the second leading diagnosed cancer in the United States but is the most deadly. In 2009, an estimated 159,390 people in the United States are projected to die from lung cancer.¹ This represents 1 of every 3 cancer deaths and equates to over 400 lung cancer deaths per day in the United States. Despite a recent report showing declines in other types of cancer from 2001 to 2005, lung cancer incidence and mortality rates show dramatic variation by state and region, especially among women.² The average age-adjusted lung cancer incidence rate for the seven Appalachian Community Cancer Network (ACCN) states is nearly 10 percent higher than the national average.³ In 2003, the seven states represented by the ACCN had an age-adjusted lung cancer incidence rate of 76.7, compared with 69.8 nationwide, accounting for nearly 22% of estimated new lung cancer cases in the United States.¹ The variation in incidence and mortality rates by region may be due largely to divergent trends in cigarette smoking, secondhand smoke exposure, and exposure to radon gas, all preventable risk factors for lung cancer. By eliminating first and secondhand smoking and radon exposure, the incidence of lung cancer would decline dramatically.

Cigarette Smoking

Cigarette smoking alone causes nearly 90 percent of lung cancer deaths.⁴ Men and women who smoke are 23 and 13 times, respectively, more likely to develop lung cancer.⁴ The risk of smokers developing lung cancer is directly related to the number of years and cigarettes smoked. From 2000 to 2004, an average of 125,522 Americans (78,680 males and 46,842 females) died of smoking-attributable lung cancer.⁵ With 20.2 percent of adults 18 years or older being active smokers, the average smoking rate for the seven ACCN states is higher than the national average (20.2 percent vs. 18.3 percent).⁶ Of the ACCN states, smoking prevalence ranges from 14.9 percent (Maryland) to 26.5 percent (West Virginia).⁶ One in five women and one in 12 men diagnosed with

lung cancer are nonsmokers.⁷ Environmental risk factors, such as secondhand smoke and radon gas exposure account for a significant number of the lung cancer cases among nonsmokers. Further investigation is warranted into other possible environmental contributors to lung cancer (e.g., arsenic, other metals, and PAHs associated with mining activity). These other environmental risk factors are beyond the scope of this policy brief.

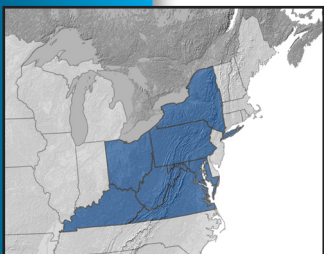
Secondhand Smoking

Secondhand smoke (SHS) is a major source of indoor air pollution and the third leading cause of lung cancer, accounting for 3,000 lung cancer deaths among nonsmokers each year.⁸ Nonsmokers who are exposed to secondhand smoke at home or work increase their risks of developing lung cancer by 20–30%.⁹ Even short-term exposure to secondhand smoke (30 minutes) in relatively low doses places healthy nonsmokers at increased risk for heart attacks, asthma attacks and bronchitis, irritation of the throat, nose, and lungs, and decreased lung functioning.¹⁰ In 2006, the U.S. Surgeon General stated that there is no safe level of secondhand smoke exposure.⁹

Radon

Radon is widely recognized as a human lung carcinogen by the U.S. Department of Health and Human Services, National Research Council, International Agency for Research on Cancer, National Environmental Health Association, U.S. Environmental Protection Agency, and the National Institutes of Health. Radon is the second-leading cause of lung cancer.¹¹ Despite the established relationship between radon and lung cancer, the general public does not tend to view radon as a serious health hazard.^{12,13} Radon is a colorless, tasteless, and odorless radioactive gas found in every region in the nation, and it is derived from the decomposition of uranium in the soil. High concentrations of radon are most commonly found in uranium-rich soil, typically associated with areas of Karst geology. Radon enters a building through cracks in walls,

The Appalachia Community Cancer Network (ACCN) is a National Cancer Institute (NCI)-funded research initiative to reduce cancer health disparities in the Appalachian region through community participation in education, research, and training. The ACCN is one of 25 NCI Community Network Programs across the country funded by the Center to Reduce Cancer Health Disparities at NCI.



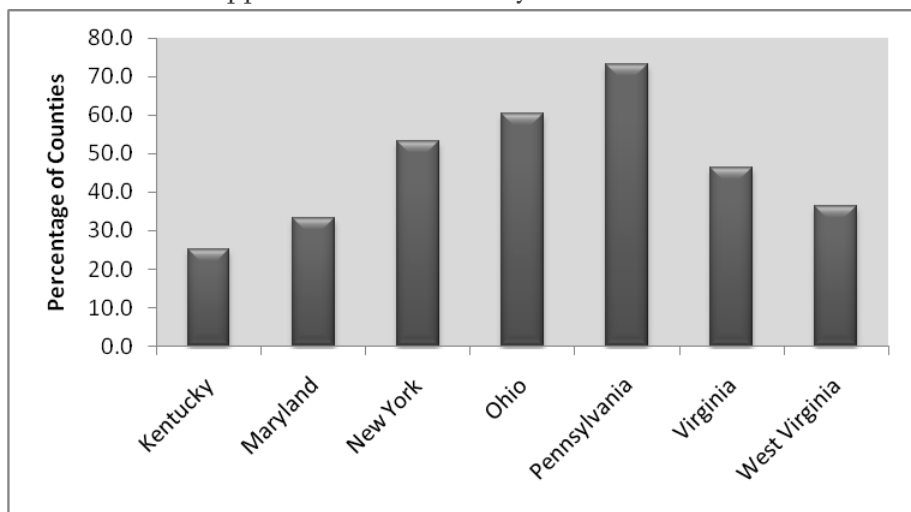
basement floors, foundations, and other openings, and becomes trapped in the dwelling. When radon is inhaled, radioactive decay products readily deposit in the lungs, irradiating cells in the airways and increasing the risk of lung cancer. Exposure to radon, largely due to high concentrations of radon in the home, is associated with an estimated 15,400 to 21,800 cases, or approximately 10% of lung cancer cases in the United States each year.¹¹ In 2005, the U.S. Surgeon General strongly advised that all homes be tested for radon. Radon can be detected with a simple and inexpensive test and easily controlled through well-established venting techniques.¹⁴ Radon levels greater than 4 picocuries per liter (pCi/L) are at the action level designated by the EPA.¹⁴ If high levels of radon are found, properly installed mitigation systems reduce the risk of exposure. At least 50 percent of the counties in three of the seven ACCN states are registered by the Environmental Protection Agency as Zone 1 counties (New York, Pennsylvania, and Ohio), areas with the highest potential for radon exposure (see Figure). Overall, 46.8% of the counties in the ACCN states are located in Zone 1 areas.¹⁵

tory of smoking.^{11,14} If exposed to 4 pCi/L of radon over a lifetime, 7 per 1,000 of those who never smoked would develop lung cancer versus 62 of 1,000 smokers.¹⁴ Among never-smokers, radon exposure may be more harmful for those exposed to SHS, although there is conflicting evidence on the link between radon and lung cancer in non-smokers.^{16,17}

Lung Cancer Related Legislation in the Appalachian States

Policy change at both the state and local level can have a dramatic impact on reducing the three leading environmental risk factors in the development of lung cancer.¹⁸⁻²⁶ Five policy alternatives known to reduce the environmental risk factors for lung cancer are: tobacco excise taxes, adequate and sustained funding for comprehensive tobacco control, smoke-free workplace policies, radon testing and mitigation, and comprehensive coverage for tobacco dependence treatment. Lung cancer rates in California declined dramatically following the implementation of a comprehensive tobacco control strategy including policy change.²⁷

Percentage of Counties in EPA Radon Zone 1* for the Seven Appalachian Community Cancer Network States¹⁵



*Note: Zone 1 counties have the highest potential risk for radon exposure with predicted average indoor radon screening levels > 4 pCi/L.

Combined Effects of Tobacco Smoke and Radon

Exposure to both tobacco smoke and radon gas multiplies one's chances of developing lung cancer. There are more radon-related lung cancers in persons with a his-

Tobacco Excise Taxes

The effectiveness of tobacco tax increases on decreased tobacco use prevalence is well documented. The inverse relationship between tobacco price and prevalence is particularly pronounced among kids and young adults.^{32, 33} Three of the seven ACCN states (Kentucky, Virginia and West Virginia) have tobacco excise taxes well below the national average. Tobacco excises taxes in ACCN states range from \$0.30 (Virginia) to \$2.75 (New York).²⁸

CDC Recommended Funding for Comprehensive Tobacco Control

While state supported funding of tobacco control programs reduces smoking and secondhand smoke exposure, ACCN states fund these efforts at less than 20% of the recommended CDC levels.²⁹ Similarly, 41 states, includ-

ing the District of Columbia, also fund tobacco control programs at these low levels.

nationally certified, Kentucky, for example, does not have the regulations in place to put this law into action.³¹ As a

result, there is no assurance that radon mitigators in Kentucky are consistently installing radon mitigation units. It is unknown whether other ACCN states experience similar impediments to effective policy implementation.

Comprehensive Coverage for Tobacco Dependence Treatment

Despite the availability of updated tobacco treatment guidelines, many states do not provide comprehensive tobacco treatment coverage. Only one state (Maryland) in the ACCN region provides both Medicaid coverage for tobacco treatment and has a mandate for private insurance coverage.

One state (Kentucky) provides no Medicaid coverage, with the exception of individual counseling for pregnant women. According to the American Lung Association, only Pennsylvania receives a “C” related to tobacco treatment coverage, with all other states receiving an “F”.²⁹

Recommendations for Policy Development in the ACCN States

1. Increase Tobacco Excise Taxes

Raising the price of tobacco products decreases the prevalence of tobacco use, particularly among youth and young adults. Further, tobacco tax increases produce “substantial long-term improvements in health.”³⁴

2. Achieve CDC Recommended Funding for Comprehensive Tobacco Control

All states within the ACCN region should increase funding comprehensive tobacco control programs to at least 80% of CDC recommended levels.²⁵ These levels have been established based on careful evaluation of best practices and have been shown to have both public health and economic benefit.

3. Increase the Percent Covered by Comprehensive Smoke-free Workplace Policies

Comprehensive smoke-free workplaces are the only way to protect all workers from the dangers of secondhand smoke. All the ACCN states need to implement and/

Lung Cancer Related Legislation in the ACCN States Compared to the National Average

	ACCN States	United States
State Tobacco Tax, 2009 ²⁸	\$1.26	\$1.20
% of CDC Recommended State Spending Used for Tobacco Control, 2008 ²⁹	19.4	30.1
% of States with Comprehensive Smoke-free Workplace Laws, 2009 ³⁰	52.3	40.3
% States Requiring Radon Testers or Mitigators be Certified, 2009 ^{31**}	100.0	27.3
% of States Offering Comprehensive Tobacco Treatment, 2008 ²⁹	71.4	75.0

* FY2009 funding included.
 **States may enact a law, but not adopt regulations to make the law effective. For example, Kentucky enacted KRS 211.855—856 but has yet to adopt regulations as of July 2009.

Smoke-free Workplace Policies

Comprehensive smoke-free workplace policies reduce secondhand smoke exposure for workers and patrons, reduce smoking prevalence, and promote quitting. As of July 1, 2009, 52.3 percent of workers in the seven ACCN states were covered by comprehensive smoke-free workplace policies, compared to 40.3 percent of workers in the US.³⁰ Two of the seven ACCN states (Pennsylvania and Virginia) have weak state laws with multiple exemptions that do not protect all workers from secondhand smoke. Conversely, Ohio, New York, and Maryland have comprehensive statewide smoke-free policies that cover all workers. Comprehensive local laws in Kentucky and West Virginia protect 29.5% and 36.9 % of workers, respectively.³⁰ Whether through state or local control, the gold standard for smoke-free policy is a law that covers all workplaces and enclosed public places, has no or very few exemptions, and protects all workers from secondhand smoke exposure.

Certification of Radon Testers and Mitigators

Laws mandating that no person may provide radon services unless state or nationally certified is one common policy approach. However, the impact of these policies has not been established. While each of the seven ACCN states requires that radon testers or mitigators be state or

or strengthen existing smoke-free policies to protect all workers. In states with few local policies, emphasis needs to first be placed on building local demand and capacity for comprehensive smoke-free policies before advocating for a statewide law.

4. Ensure Certification of Radon Testers and Mitigators and Enact Policy to Promote Radon Testing
ACCN states need to consider adopting laws and regulations to require: (a) testing and disclosure of radon during real estate transactions; (b) promotion of radon resistant new construction; (c) provisions for radon-related services in rental housing; (d) assuring the qualification of radon testers and mitigators through certification programs; (e) mandating school radon testing, disclosure, and mitigation; and (f) promotion of radon awareness and education programs.

5. Achieve Comprehensive Coverage for Tobacco Dependence Treatment

Poverty and lower socioeconomic levels endemic in the ACCN region are known to be associated with higher

levels of tobacco use prevalence. Clearly, private and public insurance investment in tobacco dependence treatment is cost effective for both individual and public health, based on clinical practice guidelines.²⁶

Summary

The average age-adjusted lung cancer incidence rate for the seven ACCN states is nearly 10% higher than the national average.³ Tobacco exposure and radon are the major contributors to lung cancer in the ACCN region. Policies reducing radon exposure, secondhand smoke and tobacco use would dramatically reduce the incidence of lung cancer in the region. Increasing the tobacco excise tax, increasing funding for comprehensive tobacco control programs, implementing comprehensive smoke-free workplace policies, enacting comprehensive radon testing and mitigation policies, and mandating comprehensive coverage for tobacco treatment are all effective population-based strategies for preventing lung cancer in the ACCN region.

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