

Conference Abstracts

Structural Determinants of Meeting Healthy People 2030 Lung Cancer Mortality Targets: A County-Level Analysis Across New York State

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Background

Lung cancer is the leading cause of cancer-related mortality in the United States, and achieving the Healthy People 2030 (HP2030) target of ≤ 25.1 deaths per 100,000 remains a significant public health challenge. Geographic and structural inequities limit access to prevention, screening, and specialty care, disproportionately affecting rural communities. This study evaluates county-level characteristics associated with meeting the HP2030 objective across New York State to identify key contributors to lung cancer mortality disparities.

Methods

A cross-sectional analysis of all 62 New York counties was conducted using state cancer registry data, BRFSS indicators, EPA environmental exposure metrics, and specialist workforce statistics. Variables included adult smoking prevalence, e-cigarette use, poverty, radon classification, asbestos-related death rates, and pulmonologist density. Counties were categorized as meeting or not meeting the HP2030 benchmark. Differences between groups were assessed using independent t-tests and chi-square tests. A LASSO regression model was constructed to evaluate the relative contribution

of each variable to lung cancer mortality, with model performance assessed using R^2 and RMSE.

Results

Only 11.3% of counties met the HP2030 mortality target, and all were urban. Rural counties, which comprised 40.3% of the state, failed to meet the benchmark. Counties meeting the target had significantly lower smoking prevalence and substantially higher pulmonologist density, reflecting greater access to screening centers and specialized diagnostic pathways. Counties not meeting the target demonstrated higher environmental carcinogenic exposure, including asbestos-related deaths and radon levels. LASSO regression identified pulmonologist availability as the strongest protective factor (coefficient -3.75), while asbestos-related deaths, e-cigarette prevalence, adult smoking, and poverty were positively associated with increased mortality. The radon coefficient reflected EPA coding, where Zone 1 corresponds to the highest exposure. The model performed robustly ($R^2 = 0.66$; RMSE = 5.14) (Figure 1).

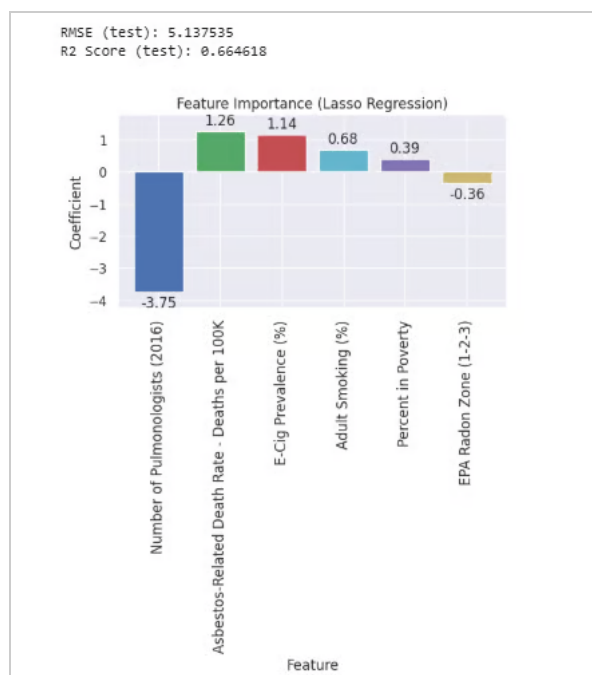


Figure 1. LASSO Regression Feature Importance Identifying Predictors of County-Level Lung Cancer Mortality in New York State

Conclusion

Progress toward the HP2030 lung cancer mortality objective is concentrated exclusively in urban counties with high specialist density and accessible screening infrastructure. Rural counties remain structurally disadvantaged due to limited pulmonology workforce capacity, reduced screening availability, and higher tobacco exposure. Strengthening rural screening networks and expanding specialist access represent the most impactful strategies for advancing equitable lung cancer outcomes across New York State.