

Lung Cancer Screening Rates and Predictors of Screening in Rural and Urban Primary Care Facilities in Parts of Kansas and Missouri

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1. Background

High rates of lung cancer mortality could be reduced by improved rates of lung cancer screening (LCS). There is an urgent need to understand the factors associated with low LCS rates in primary care. Unlike other cancers where eligibility depends mostly on age, which is available within the electronic health record (EHR), patient eligibility for LCS includes quantifying lifetime cigarette use by calculating pack years, recording quit dates and years since quit, and documentation of shared decision making (SDM). Despite efforts to increase screening in clinical settings, rates remain low at 4.5 percent in 2022.

2. Goals

- To ascertain the adequacy of Electronic Health Record (EHR) documentation to support guideline-based LCS across a range of primary care practices in the Midwest, including documentation of a) current smoking status; b) date quit (for former smokers); c) pack-years
- To assess practice-level variability in LCS rates

3. Solutions and Methods

Data were collected from EHR and claims from 1/1/2021 to 12/31/2022. Guideline-based eligible patients for LCS were identified. The proportion of eligible patients screened was calculated for 2021 and 2022 and the rate of re-screening in 2022 was calculated. Chi-squared tests were used to compare categorical variables.

4. Outcomes

Smoking status was available for 40 percent of patients; other eligibility criteria were largely missing and in a difficult format, i.e., no discrete variables. Packs per day was missing for 74.4 percent of current and 100 percent of former smokers. Years smoked was missing for 98.6 percent of current and 98.8 percent of former smokers. Pack years was missing for 99.2 percent of current and 100 percent of former smokers. Years quit was missing for 98.1 percent of former smokers. Of 807,288 unique individuals, 6,887 patients had enough information to be identified as eligible for LCS. The individual screening rates were 4.1 percent for 2021 and 4.2 percent for 2022. The re-screen rate for 2022 was 1.7 percent. The facility screening rates varied from 0.0-9.2 percent for 2021 and 0.0-14.9 percent in 2022. Being a former smoker decreased the probability of receiving LCS in 2021 (RR: 0.30, 95% CI: 0.23-0.39) and 2022 (RR: 0.27, 95% CI: 0.21-0.35). Older age increased the probability of receiving LCS in 2021, those aged 55-64 (RR: 2.77, 95% CI: 1.49-5.14), 65-70 (RR: 4.21, 95% CI: 2.27-7.78), and 71+ (RR: 2.51, 95% CI: 1.34-4.70) had increased probability of being screened relative to those 50-54. In 2022, individuals 65-70 (RR: 2.4, 95% CI: 1.46-3.83) had increased probability of being screened relative to those 50-54. Rural codes, RUCA 4-10, decreased the probability of receiving LCS in 2021 (RR: 0.59, 95% CI: 0.44-0.80) and 2022 (RR: 0.71, 95% CI: 0.54-0.93).

5. Lessons Learned and Future Directions

The biggest challenge to LCS uncovered here was EHR data quality for patient identification. Strikingly, 60 percent of patients did not have smoking status recorded and over 97 percent of key variables used

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for LCS eligibility were missing. The rate of missing data, by criterion, does not support proper identification of individuals who are eligible for LCS. Providers do not have the right systems in place to even identify LCS eligible and, as a result, LCS screen and re-screen rates are low.