Identifying and understanding multilevel determinants of racial and ethnic disparities in lung cancer screening utilization

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Lung cancer screening (LCS) with low-dose computed tomography affords a major opportunity to reduce lung cancer mortality and disparities among disadvantaged populations. Yet, LCS has been underutilized to date, with <15% of eligible adults screened nationally. Data also suggest that LCS is not being delivered effectively or equitably. Identifying and understanding factors associated with LCS utilization, particularly ones that contribute to disparities, is therefore essential to optimize delivery of LCS.

Our overall study objective is to identify and understand multilevel determinants of racial and ethnic disparities in LCS utilization. We will specifically determine the influence of factors at the individual, neighborhood, provider, and facility levels on disparities in LCS utilization, starting from the opportunity to be screened, as measured by the completeness of electronic health record (EHR) documentation on smoking history to assess LCS eligibility (Aim 1), followed by LCS referral and initiation (Aim 2), and referral and use of smoking cessation services (Aim 3). To address these aims, we are analyzing electronic health record (EHR), questionnaire, and geospatial data on over 1.4 million adults ages 50 to 80 years from an integrated health care system in Northern California from 2014 to 2023. Our work so far has focused on addressing Aim 1.

Examining six-month intervals from July 2014 to December 2022, the proportion with complete EHR documentation on smoking history to assess LCS eligibility increased by 4.5% (71.7% to 76.2%) overall and by 6.7% (69.0% to 75.7%) for Black, 6.5% (68.4% to 74.9%) for Native American, 5.7% (71.6% to 77.3%) for Hispanic, 5.4% (71.7% to 77.1%) for White, 4.6% (77.0% to 81.6%) for Asian, and 4.7% (77.4% to 82.1%) for multi-race adults ages 50-80 years. Although the absolute change in complete smoking history documentation was highest for Black and Native American adults, the proportion of Black and Native American adults with complete smoking history documentation was consistently lower over time compared to the other groups. In multivariable logistic regression analyses adjusting for demographic factors, clinical characteristics, and prior health services use, the odds of complete smoking history documentation (during the most recent six-month interval) remained lower for Black [odds ratio (95% confidence interval): 0.98 (0.96-0.99)] and Native American [0.93 (0.88-0.99)] adults and higher for Asian [1.38 (1.36-1.39)], Hispanic [1.16 (1.15-1.18)], and multi-race [1.23 (1.19-1.26)] adults, relative to White adults, highlighting disparities in the opportunity to be screened. As our work progresses, we expect to gain greater empirical insight into the key modifiable drivers of racial and ethnic disparities at critical steps in LCS from eligibility assessment to screening initiation.