

Analysis of Lung Cancer Disparities in Northwest Indiana

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Background and Hypothesis:

Lung cancer is the first leading cause of cancer death worldwide (~1.8 million deaths pa.). Low-Dose Computed Tomography (LDCT) screening is a preventative measure to diagnose lung cancer at an early stage, which increases the chance of survival. Northwest Indiana is a diverse region (830,000 pop.) that faces unique challenges to equitable health outcomes and access to preventative treatments, particularly within minoritized communities from a low socioeconomic status. We investigated whether the vulnerable populations of Northwest Indiana have a higher incidence of lung cancer, low LDCT screening rates, and a late stage of diagnosis, in order to identify potential gaps in healthcare access and delivery.

Methods:

We used LDCT screening (n = 2,481), lung cancer incidence (n = 268) and staging (n = 257) data from ZIP Codes of six cities/towns in Northwest Indiana, provided by an urban hospital system in Northwest Indiana between 2018 and 2023. The cities/towns were grouped into 'lower' and 'upper' income according to median household income level reported by 2020 U.S. census data. Chi-Squared tests were used to determine significance.

Results:

There is no significant difference in the incidence of lung cancer between upper and lower income cities/towns (p= 0.163). However, there is a significant difference in stage I, II, and IV diagnoses between the two income groups (p = 0.021, 0.007, and 0.013 respectively), which demonstrates an inverse relationship between income level and stage of diagnosis. The lower income group is diagnosed at a younger age (p = 0.02) with advanced stage lung cancer, despite similar rates of lung cancer incidence.

Conclusion and Potential Impact:

Barriers to screening for vulnerable populations in urban areas include patient-provider mistrust, health illiteracy, and lack of healthcare services. Late stage diagnosis necessitates the development of local interventions to increase early screening.