

RESEARCH PERSPECTIVES

Lung Cancer Screening in Asians Who Have Never Smoked: We Still Need to Figure Out Who and How

Weijia Chua^{1*}

Despite major advances in treatment, lung cancer remains the leading cause of cancer-related mortality in the United States and worldwide. Early detection via annual screening with low-dose computed tomography (LDCT) imaging has been shown to improve mortality in certain high-risk populations with a significant smoking history and is currently standard of care in the United States. However, a significant proportion of lung cancer occurs in people who have never smoked and do not meet the screening criteria, especially among women and individuals from countries in East Asia. There have been several observational studies conducted in East Asia that show LDCT screening detects lung cancer in never smokers, though they were not designed to show a mortality benefit and there is concern that the lung cancers detected largely represent overdiagnosis of indolent cancers. How to go about screening these populations requires careful consideration as every screening protocol needs to have its benefits balanced against the risks. More research is needed to determine the best screening strategy for this population.

Key Words: lung cancer ■ screening ■ never smokers ■ Asians ■ overdiagnosis

Lung cancer remains the leading cause of cancer mortality in the United States and worldwide. In 2022, lung cancer was responsible for approximately 2.5 million new cases and over 1.8 million deaths globally.^{1,2} Despite major advances in immunotherapy and targeted therapies for lung cancer during the past decade, early detection remains the most effective strategy to reduce mortality with 5-year survival increasing from 9% for distant-stage disease to 64% for localized-stage disease.¹ Since screening uptake in at-risk populations in the U.S. remains low, most lung cancers are unfortunately diagnosed at an advanced stage as patients often remain asymptomatic until late into the disease.³

LUNG CANCER SCREENING

The goal of lung cancer screening is to detect lung cancer at an early stage when it is more treatable and potentially curable. The largest randomized controlled trial evaluating

low-dose computed tomography imaging (LDCT) screening for lung cancer in the U.S. was the National Lung Screening Trial (NLST) conducted during 2002–2004 under the auspices of the National Cancer Institute at the National Institutes of Health with results published in 2011. The trial showed that annual screening with LDCT in high risk current or former smokers for three years resulted in a 20% decrease in lung cancer mortality compared with chest radiograph at six years of follow up.⁴ Based on the results from this and other trials, the U.S. Preventive Services Task Force issued their first recommendation for annual screening for lung cancer with LDCT in 2013. It was updated in 2021 to expand eligibility criteria to those aged 50–80 years who have a 20 pack-year smoking history and currently smoke or have quit within the past 15 years.^{5,6}

While tobacco smoking is the most well-established risk factor for lung cancer, there is a growing concern for lung cancer in people who have never smoked,

Correspondence to: Weijia Chua, 300 Pasteur Dr, Stanford, CA 94305, USA. Email: wchua@stanford.edu

© 2026 Journal of Asian Health, Inc.

Journal of Asian Health is available at <https://journalofasianhealth.org>

POPULAR SCIENTIFIC SUMMARY

- Lung cancer is the leading cause of cancer-related deaths in the United States and worldwide. Screening tests can catch lung cancer early in its disease course when it is more treatable and potentially even curable. Screening for lung cancer with yearly computed tomography (CT) imaging has been shown to improve survival in specific high-risk groups of people who smoke or previously smoked and is standard of care in the United States. However, there is a significant proportion of people who develop lung cancer who have never smoked and do not meet the screening criteria, especially among certain populations including women and individuals from countries in East Asia. How to go about screening these populations requires careful consideration as every screening protocol needs to have its benefits (such as improved survival from lung cancer) balanced against the risks (such as radiation exposure and unnecessarily invasive testing or treatment). While this balance favors yearly CT screening in people with a heavy smoking history, there is not enough current evidence to show that it also does for screening very broad populations of Asian patients who have never smoked. More research studies are needed to determine the best screening protocol for this population.

especially among certain populations including women and individuals from countries in East Asia. It is estimated that 12–15% of lung cancers in the U.S. occur in never smokers and more than 50% of Asian American women who are diagnosed with lung cancer have never smoked.^{7–10} In certain subpopulations, the proportion is even higher, with more than 80% of lung cancer among Chinese women in both China and the U.S. occurring in those who have never smoked.^{9–11} Data from Taiwan's National Cancer Registry indicated that more than 50% of lung cancer patients had never smoked, and of these patients nearly 60% had stage IV disease at diagnosis.¹² Recent global data suggest that if lung cancer in never-smokers were a separate disease entity it would rank as the eighth leading cause of cancer mortality.¹³ Given the observed mortality reduction from screening among patients with a history of smoking, clinicians have been interested in whether screening can benefit those who have never smoked. While a U.S. based randomized controlled trial has yet to evaluate the benefits and harms of screening specifically in those who have never smoked, several observational studies and randomized screening trials have been conducted in East Asia. These studies primarily included a mixed population of individuals who have smoked and never smoked, and results indicate that LDCT screening

detects lung cancer in never smokers. However, these studies were not designed to show a mortality benefit or evaluate the balance of harms to benefits of screening in never smokers.^{14–17}

In 2024, the Taiwan Lung Cancer Screening in Never-Smoker Trial (TALENT), the largest prospective study to evaluate the use of LDCT screening in a risk enhanced population of primarily never smokers, published its results. During 2015–2019, TALENT enrolled 12,011 participants who had never smoked (93% of participants) or had smoked less than 10 pack-years and quit for more than 15 years and had an additional risk factor for lung cancer, including family history of lung cancer, passive smoking exposure, pulmonary tuberculosis, chronic obstructive pulmonary disease, a cooking index of 110 or higher, or cooking without using ventilation. The primary outcome was lung cancer detection rate, which was 2.6% with the first LDCT scan.¹⁸ Notably this is higher than the detection rate of 1.1% in the NLST, which enrolled high-risk individuals with a heavy smoking history.⁴

Based on this data, Taiwan initiated a nationwide screening recommendation that includes women aged 45–74 and men aged 50–74 with a family history of lung cancer.¹⁹ While screening in these populations has been shown to detect early-stage lung cancer, lung cancer screening experts have raised the concern that a large proportion of the lung cancers detected represent overdiagnosis or indolent cancers that would not have become clinically significant, thus not translating to a lung cancer mortality benefit.²⁰ Of note, the 2.6% lung cancer detection rate in the TALENT study includes nodules that were diagnosed on pathology as minimally invasive adenocarcinoma and adenocarcinoma in situ. In addition, 97% of the diagnosed lung cancers were stage 1 or adenocarcinoma in situ, a stage distribution at diagnosis that is suggestive of overdiagnosis.¹⁸ An ecological cohort study using the Taiwan Cancer Registry noted that after the introduction and popularization of out-of-pocket LDCT screening (which was patient or provider initiated, prior to nationwide screening recommendations), there was a rise in early stage lung cancer diagnoses without a concomitant decrease in late stage diagnoses and no change in lung cancer mortality.²¹ These findings further support the concern that screening in this population is associated with overdiagnosis.

RISKS AND BENEFITS OF SCREENING

Overdiagnosis exposes patients to the harms associated with screening and subsequent treatment does not confer

a mortality benefit (i.e. does not reduce the risk of death despite treatment). In the case of lung cancer screening, the potential harms include complications from biopsy procedures, radiation exposure from repeated imaging, psychological stress from finding a lung nodule, and consequences from unnecessary surgical and radiation treatments. In light of these potential harms, there needs to be careful consideration and evidence to support a benefit when defining a specific population to screen.

While screening very broad populations of Asian patients who have never smoked for lung cancer via traditional imaging screening may not be the answer, certainly the need for screening some subpopulation still exists. So how do we go about determining whom to screen? Randomized controlled trials to demonstrate a mortality benefit in this population are likely not practical due to the sample size and length of follow-up period needed. It is also not clear that clinical trials performed in Asia can be extrapolated to U.S. populations as there appears to be differences in lung cancer risk in never-smokers among different countries.

As outlined in the early detection committee report on screening individuals who have never smoked by the International Association for the Study of Lung Cancer (IASLC), the most promising strategy might be to develop a risk assessment tool that could be used in combination with a biomarker test as part of a precision medicine approach to identify high-risk subpopulations who would then undergo imaging screening.²² This approach could then be validated in different countries and different subpopulations.

However, as screening criteria becomes more complicated so does its implementation. As learned from experience with lung cancer screening in those with a smoking history, uptake and implementation has been a major barrier to screening success. Assessing complicated risk factors and interpreting a biomarker test raises several questions, including which providers have the bandwidth and expertise to perform these assessments and interpret these tests. In addition to risk assessment, also necessary is the need to define more specific guidelines for when to intervene and how to manage subsolid lung nodules, which are more common in Asian patients and those who have not smoked. As we strive to identify who best to screen, we must also plan for the how.

There is an increasing interest in the Asian American community to improve early detection of lung cancer and implement screening practices. The public health need in never smokers and in Asian Americans is a growing concern. However, while the benefits of screening are intuitive for patients to understand, the harms are more challenging to convey. Clinicians, researchers, and policymakers have a responsibility to make careful informed decisions about how to approach this in the best interests of each patient.

ARTICLE INFORMATION

Affiliations

¹Division of Pulmonary, Allergy, and Critical Care Medicine, Department of Medicine, Stanford University School of Medicine, Palo Alto, CA, USA

Conflicts of interest and funding

The authors has not received any funding or benefits from industry or elsewhere to conduct this study.

REFERENCES

1. Siegel RL, Kratzer TB, Giaquinto AN, Sung H, Jemal A. Cancer statistics, 2025. *CA Cancer J Clin.* 2025;75(1):10–45. doi: 10.3322/caac.21871
2. Bray F, Laversanne M, Sung H, et al. Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin.* 2024;74(3):229–63. doi: 10.3322/caac.21834
3. American Lung Cancer Association. State of lung cancer. Lung cancer key findings 2025. Available from: <https://www.lung.org/research/state-of-lung-cancer/key-findings> [cited 9 November 2025]
4. The National Lung Screening Trial Research Team. Reduced lung-cancer mortality with low-dose computed tomographic screening. *N Engl J Med.* 2011;365(5):395–409. doi: 10.1056/NEJMoa1102873
5. deKoning HJ, van der Aalst CM, de Jong PA, et al. Reduced lung-cancer mortality with volume CT screening in a randomized trial. *N Engl J Med.* 2020;382(6):503–13. doi: 10.1056/NEJMoa1911793
6. US Preventive Services Task Force, Krist AH, Davidson KW, et al. Screening for lung cancer: US Preventive Services Task Force recommendation statement. *JAMA.* 2021;325(10):962–70. doi: 10.1001/jama.2021.1117
7. Siegel DA, Fedewa SA, Henley SJ, Pollack LA, Jemal A. Proportion of never smokers among men and women with lung cancer in 7 US states. *JAMA Oncol.* 2021;7(2):302–4. doi: 10.1001/jamaoncol.2020.6362
8. Islami F, Marlow EC, Thomson B, et al. Proportion and number of cancer cases and deaths attributable to potentially modifiable risk factors in the United States, 2019. *CA Cancer J Clin.* 2024;74(5):405–32. doi: 10.3322/caac.21858
9. DeRouen MC, Canchola AJ, Thompson CA, et al. Incidence of lung cancer among never-smoking Asian American, native Hawaiian, and Pacific Islander females. *J Natl Cancer Inst.* 2022;114(1):78–86. doi: 10.1093/jnci/djab143
10. Pinheiro PS, Callahan KE, Medina HN, et al. Lung cancer in never smokers: distinct population-based patterns by age, sex, and race/ethnicity. *Lung Cancer.* 2022;174:50–6. doi: 10.1016/j.lungcan.2022.10.009
11. Wang JB, Jiang Y, Wei WQ, Yang GH, Qiao YL, Boffetta P. Estimation of cancer incidence and mortality attributable to smoking in China. *Cancer Causes Control.* 2010;21(6):959–65. doi: 10.1007/s10552-010-9523-8
12. Tseng CH, Tsuang BJ, Chiang CJ, et al. The relationship between air pollution and lung cancer in nonsmokers in Taiwan. *J Thorac Oncol.* 2019;14(5):784–92. doi: 10.1016/j.jtho.2018.12.033
13. Siegel RL, Miller KD, Wagle NS, Jemal A. Cancer statistics, 2023. *CA Cancer J Clin.* 2023;73(1):17–48. doi: 10.3322/caac.21763
14. Rong F, Shi R, Hu L, et al. Low-dose computed tomography for lung cancer screening in Anhui, China: a randomized controlled trial. *Front Oncol.* 2022;12:1059999. doi: 10.3389/fonc.2022.1059999
15. Zhang Y, Jheon S, Li H, et al. Results of low-dose computed tomography as a regular health examination among Chinese hospital employees. *J Thorac Cardiovasc Surg.* 2020;160(3):824–31.e4. doi: 10.1016/j.jtcvs.2019.10.145
16. Tang W, Liu L, Huang Y, et al. Opportunistic lung cancer screening with low-dose computed tomography in National Cancer Center of China: the first 14 years' experience. *Cancer Med.* 2024;13(3):e6914. doi: 10.1002/cam4.6914
17. Kim Y. 420: implementation of organized lung cancer screening program in Korea. *Ann Oncol.* 2019;30(Suppl 2):ii14–ii19. doi: 10.1093/annonc/mdz070

-
18. Chang GC, Chiu CH, Yu CJ, et al. Low-dose CT screening among never-smokers with or without a family history of lung cancer in Taiwan: a prospective cohort study. *Lancet Respir Med.* 2024;12(2):141–52. doi: 10.1016/S2213-2600(23)00338-7
 19. Yang PC, Chen THH, Huang KP, Lin LJ, Wu CC. 8009: Taiwan national lung cancer early detection program for heavy smokers and non-smokers with family history of lung cancer. *J Clin Oncol.* 2024;42(16_suppl):8009. doi: 10.1200/JCO.2024.42.16_suppl.8009
 20. Silvestri GA, Young RP, Tanner NT, Mazzone P. Screening low-risk individuals for lung cancer: the need may be present, but the evidence of benefit is not. *J Thorac Oncol.* 2024;19(8):1155–63. doi: 10.1016/j.jtho.2024.05.001
 21. Gao W, Wen CP, Wu A, Welch HG. Association of computed tomographic screening promotion with lung cancer overdiagnosis among Asian women. *JAMA Intern Med.* 2022;182(3):283–90. doi: 10.1001/jamainternmed.2021.7769
 22. Kerpel-Fronius A, Tammemägi M, Cavic M, et al. Screening for lung cancer in individuals who never smoked: an International Association for the Study of Lung Cancer Early Detection and Screening committee report. *J Thorac Oncol.* 2022;17(1):56–66. doi: 10.1016/j.jtho.2021.07.031