

“It takes a village”

Lung Cancer Screening & Disparities

Bradley Icard, DO

Medical Director of the Lung Screening Program & LungBus 
Chest Center of the Carolinas | FirstHealth of the Carolinas
Pinehurst Medical Clinic

Objectives:

Evolving Role of Pulmonology: LDCT & Disparities

- How did we get here... Lung Cancer Crisis
- Practicing beyond the guidelines
- How to make a difference in your community

***No single clinician, specialty, or technology
can solve the lung cancer **crisis** alone...***

Daily US Death From Lung Cancer?



Brief Historical Timeline to Lung Cancer Screening

1992 ELCAP Study begins in New York

1999 ELCAP results published in the *Lancet*

2002 NLST launches

2010 NCI: LDCT reduces cancer deaths

2013 USPSTF gives lung cancer screening a Grade B

2015 ACA provisions requires private insurance plans to cover lung cancer screening

2015 CMS covers lung cancer screening for Medicare

2015 3.9% national screening rate

2019 NELSON Trial

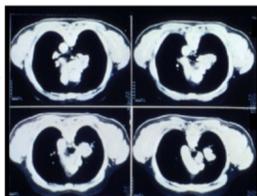
2019 MILD Trial

2021 USPSTF releases new lung cancer recommendations, lowering the initiation age to 50 and pack-history to 20 years. YSQ15 stays the same

2023 ACS releases new lung cancer guidelines 50-80-20, but eliminates Years-Since-Quit for persons who formerly smoked

Lung Cancer Screening with Low Dose Spiral CT, *Lancet* 1999

- In the New York Early Lung Cancer Action Project, low-dose CT was associated with a **5-fold difference** compared with chest X-ray in the detection of early stage, resectable lung cancers.

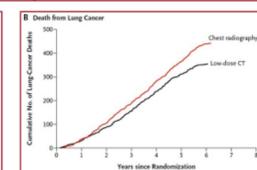


Henschke CI, McCauley DI, Yankelevitz DF, et al. Early Lung Cancer Action Project: overall design and findings from baseline screening. *Lancet*. 1999;354:99-105.

Reduced Lung-Cancer Mortality with Low-Dose Computed Tomographic Screening

The National Lung Screening Trial Research Team*

ABSTRACT
Background: Lung cancer is the leading cause of cancer death in the United States. The National Lung Screening Trial (NLST) was a randomized trial that compared low-dose CT with chest radiography in a population of 55,000 men aged 55 to 74 years who had ever smoked. The trial was designed to evaluate the effect of low-dose CT on lung cancer mortality and overall mortality. The results of the trial are presented here.

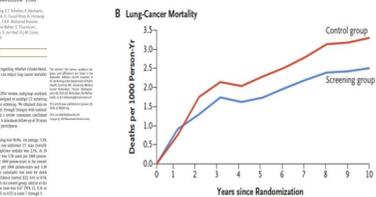


There were **20% fewer lung cancer deaths**, and **6.7% fewer all cause deaths**, in the LDCT arm compared with the CXR arm.

Number needed to screen to prevent 1 lung cancer death = 320

Reduced Lung-Cancer Mortality with Volume CT Screening in a Randomized Trial

H.J. de Koning, C.M. van der Aalst, P.A. de Jong, E.T. Scholten, K. Nackaerts, M.A. Heijmans, J.W.J. Lamers, C. Vermeulen, D. Yousaf-Khan, N. Horeweg, S. van 't Westende, M. Prokop, W.P. Mali, F.A.A. Mohammed Hossain, P.M.A. van Doorn, J.G.J.V. Aerts, M.A. den Bakker, E. Thunnissen, J. Verschuren, E. Vliegenhart, J. Walter, K. van Hest, N.J.M. Green, and M. Oudkerk



The Lung Cancer Crisis

Rising Cost of Care...

- Estimated **~265,650 NEW patients** in 2025
- Estimated **~635,500** Living with Lung Cancer
- **~\$23 Billion** in US Health Cost for Lung Cancer
- ALL Cancers = **\$208 Billion!**

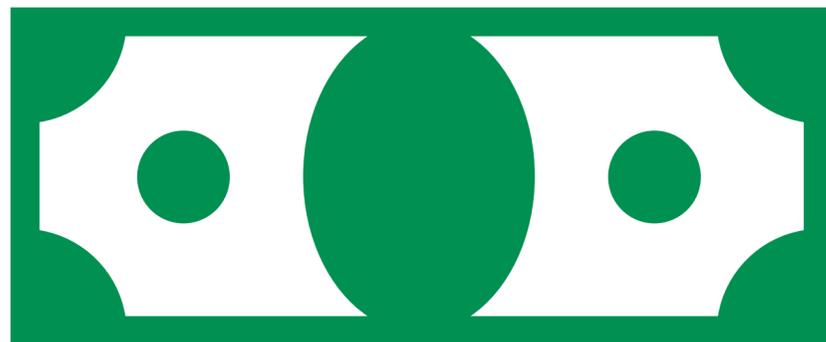
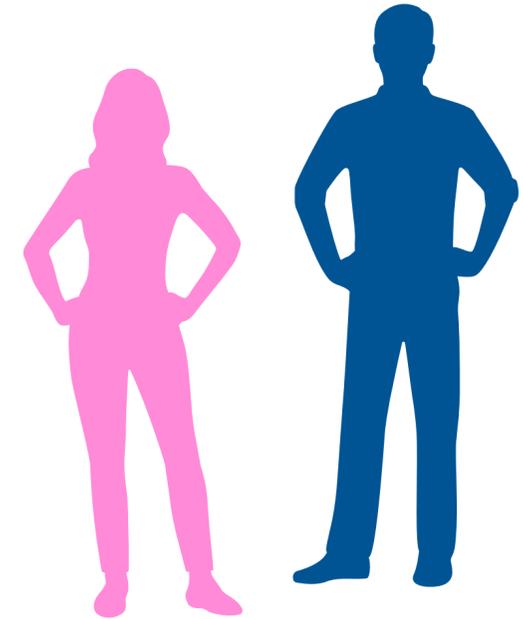
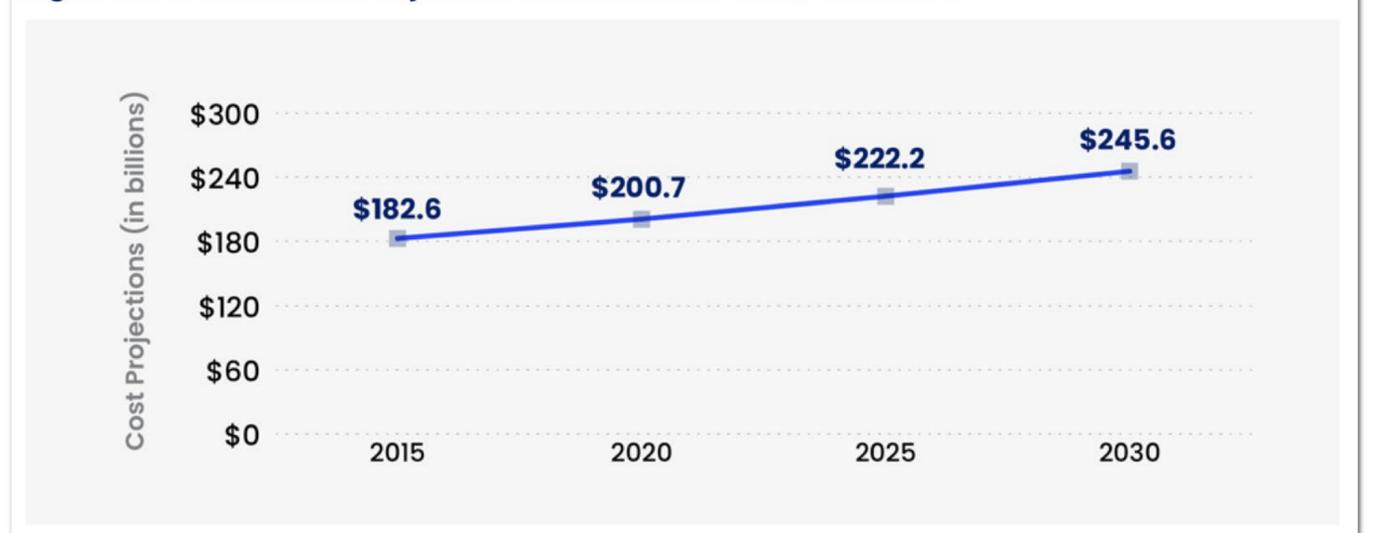


Figure 51: National Cost Projections for All Cancer Sites, 2015-2030



Comparison of Funding... \$\$\$ over 15 years

Inequity in support

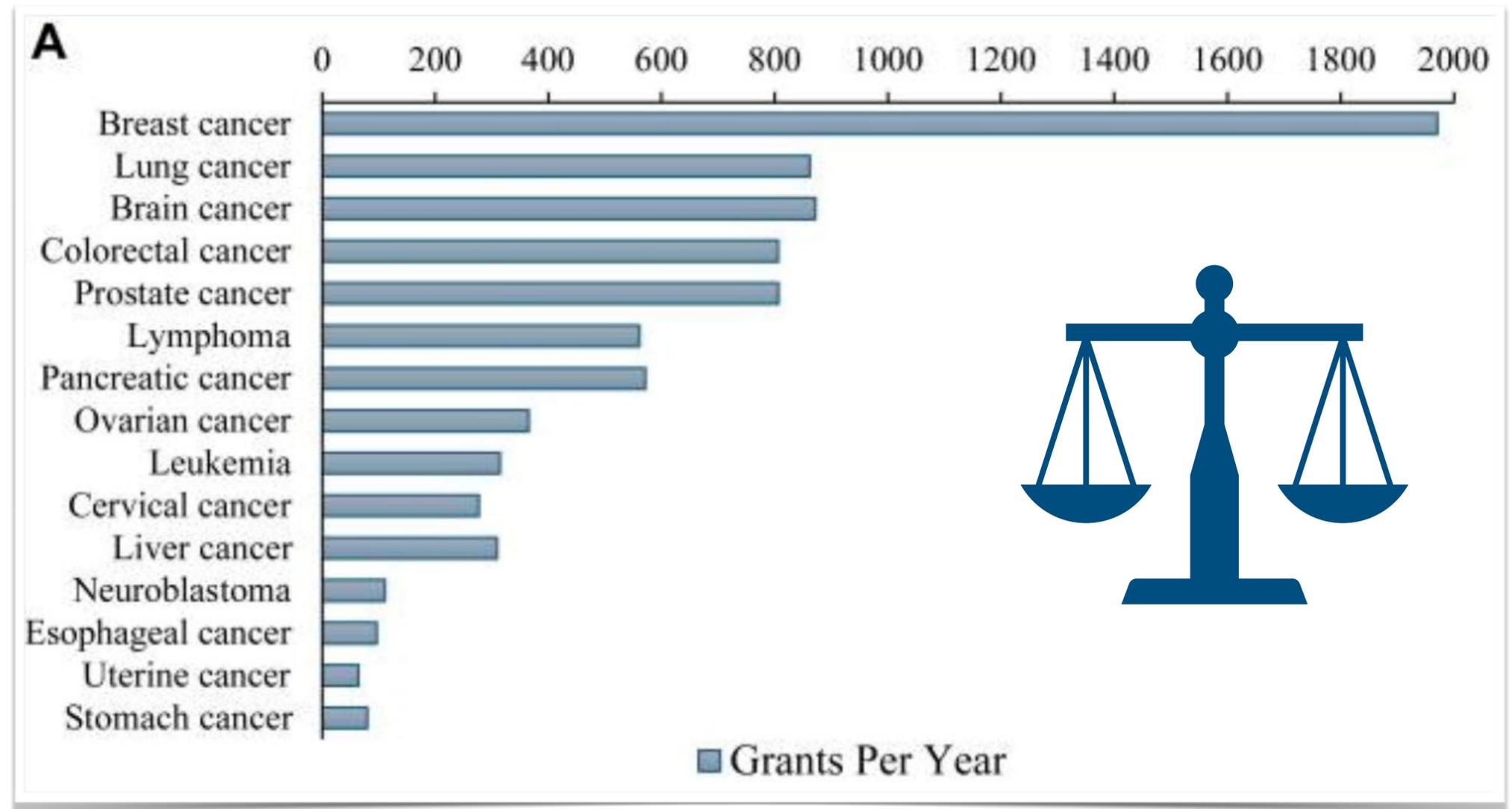
NIH (2008-2023)

- Breast: \$929M
- Colon: \$387M
- Prostate: \$359M

Total: \$1.675B

Lung: \$406M

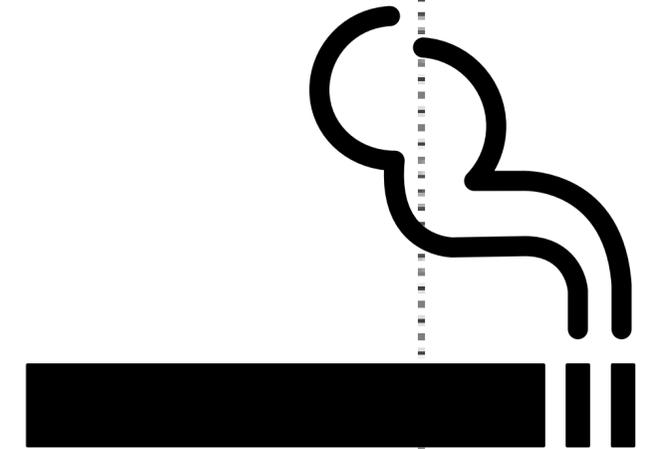
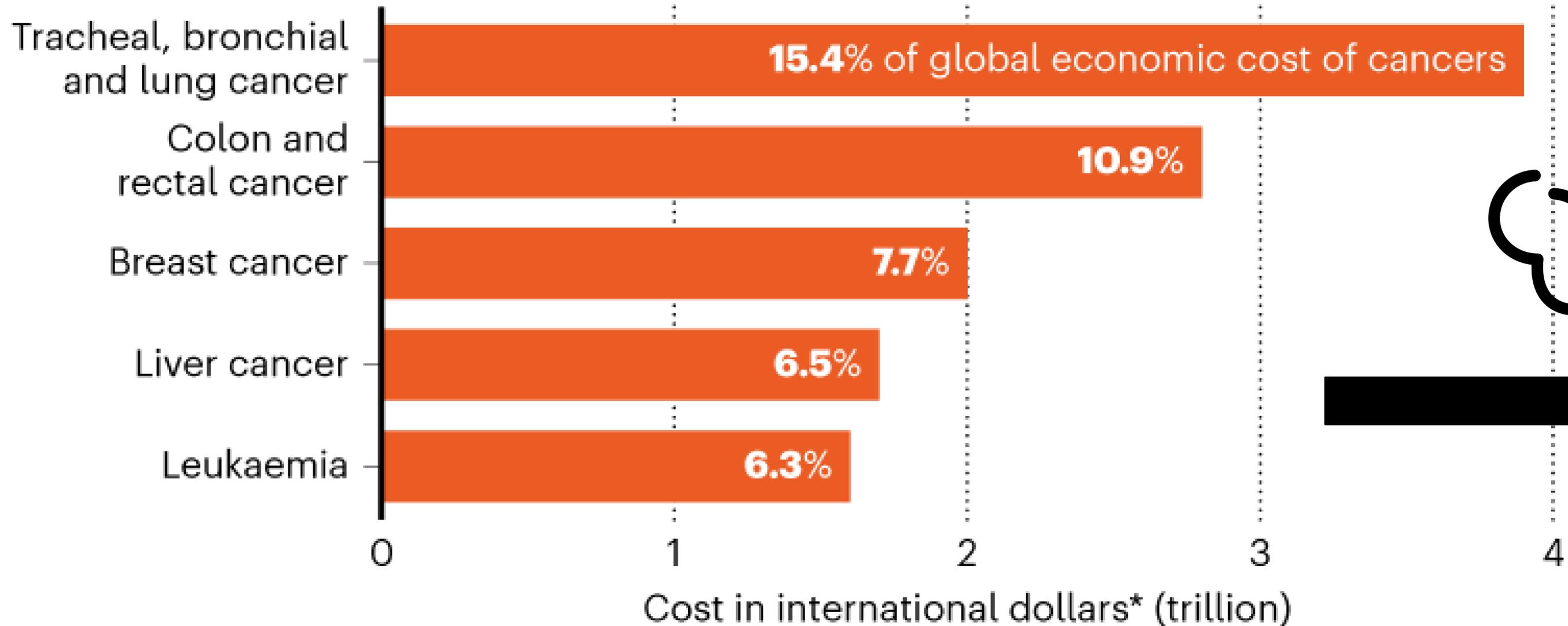
4X Less \$\$\$



Berglas E, Musheyev D, Lavi AB, Berglas RS, Berglas R, Kabarriti AE. Inequity of NIH cancer funding in the United States: an ecological study predicting funding based on disease burden from 2008 through 2023. *Lancet Reg Health Am.* 2025 Apr 2;45:101081. doi: 10.1016/j.lana.2025.101081. PMID: 40235553; PMCID: PMC11999525.

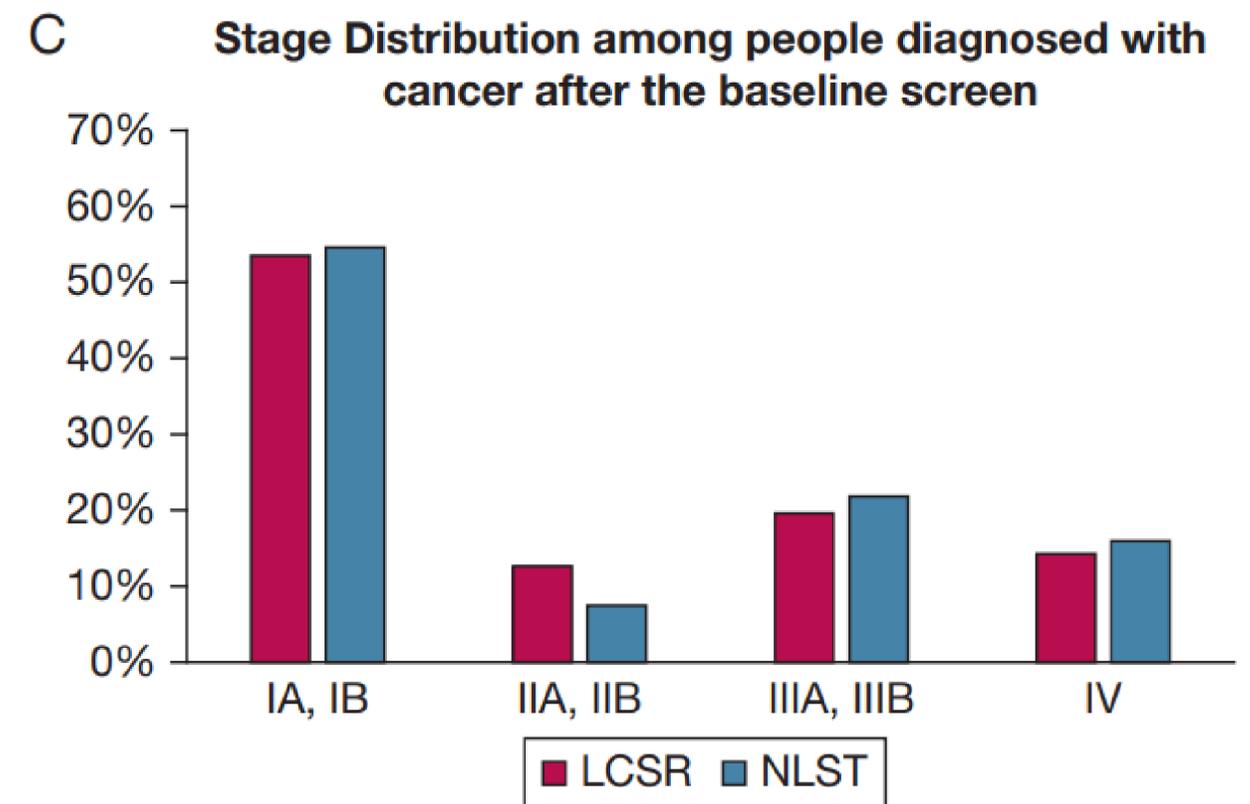
WHICH CANCERS COST THE MOST?

Five cancer types will account for almost half the global cost of cancers between 2020 and 2050. The economic burden of cancer is projected to increase substantially without cheaper treatments and better prevention.



United States: 1 Million Screened

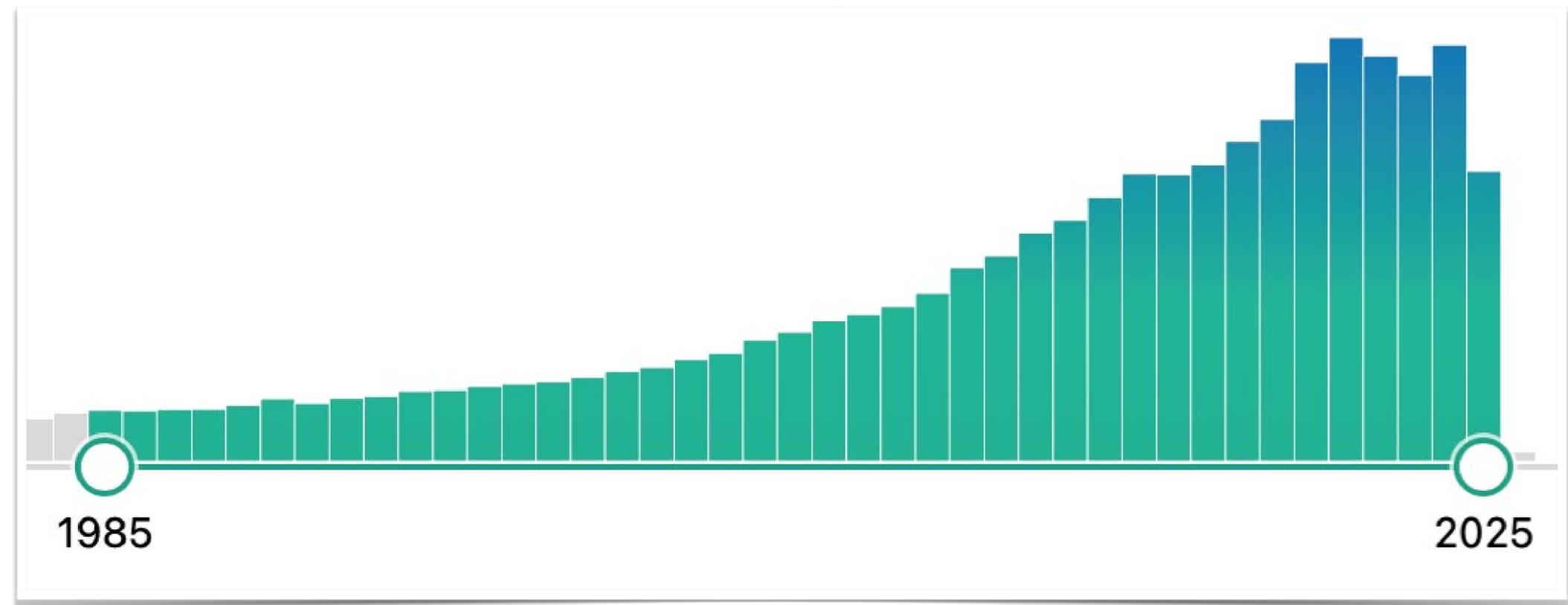
- Study looked at outcomes of 1M+ patients
- 2015-19' from ACR Registry vs NLST
- Lung-RADS Scoring of LDCTs
 - **22% Adherence rate**
 - **17% Positive Screening**
 - **53% of cancer diagnoses - Stage 1**
- Significant **"Stage Shift"**



40 Years of Publications...

PubMed | NIH/NLM

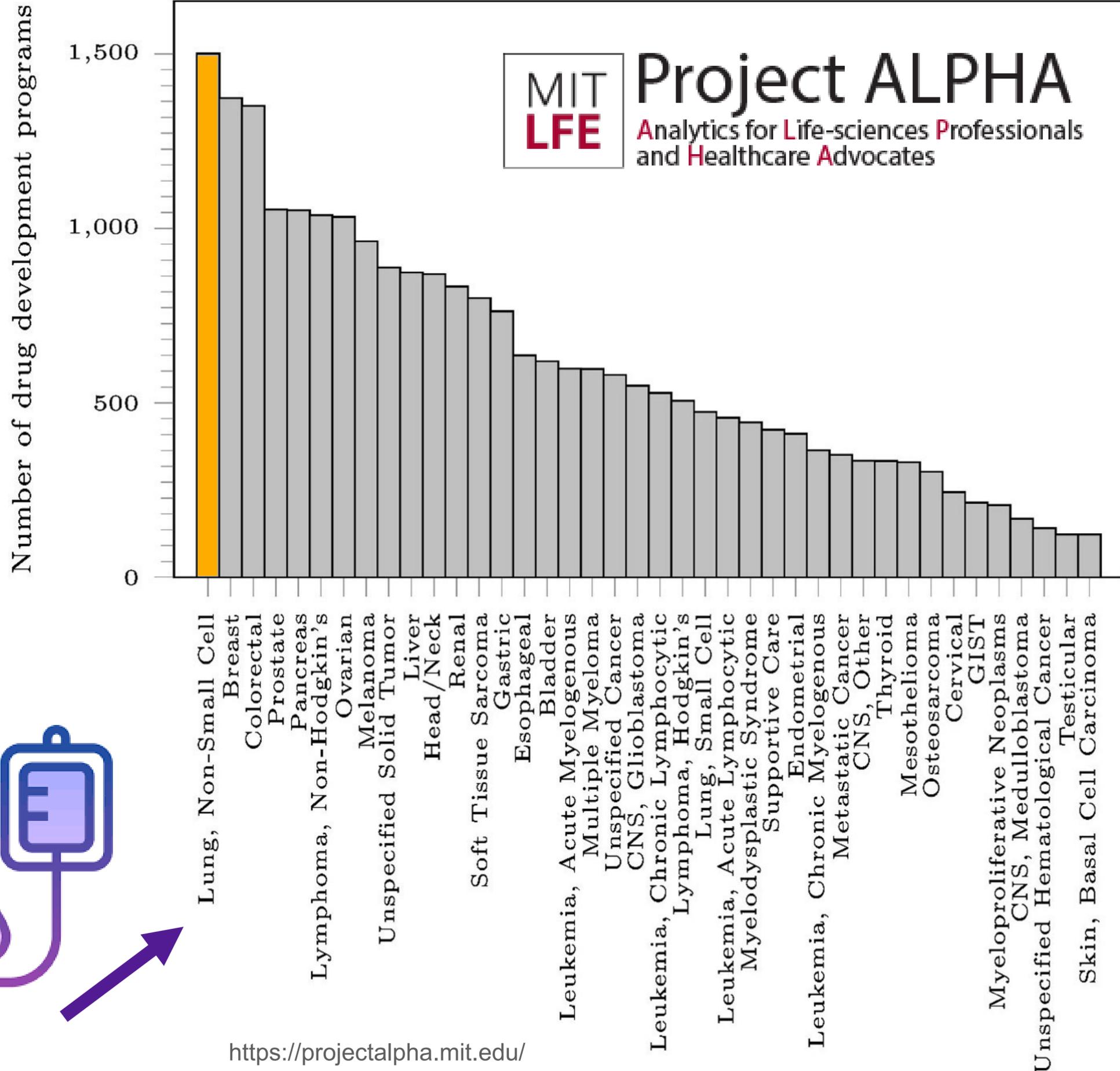
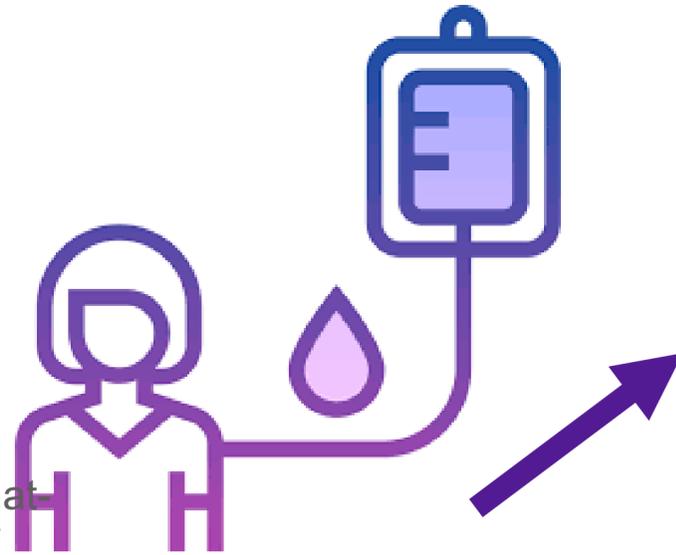
- 2024 - cresting 15,000 publications on Lung Cancer therapies
- And climbing...



What does industry have to say?

Average cost of single drug development...

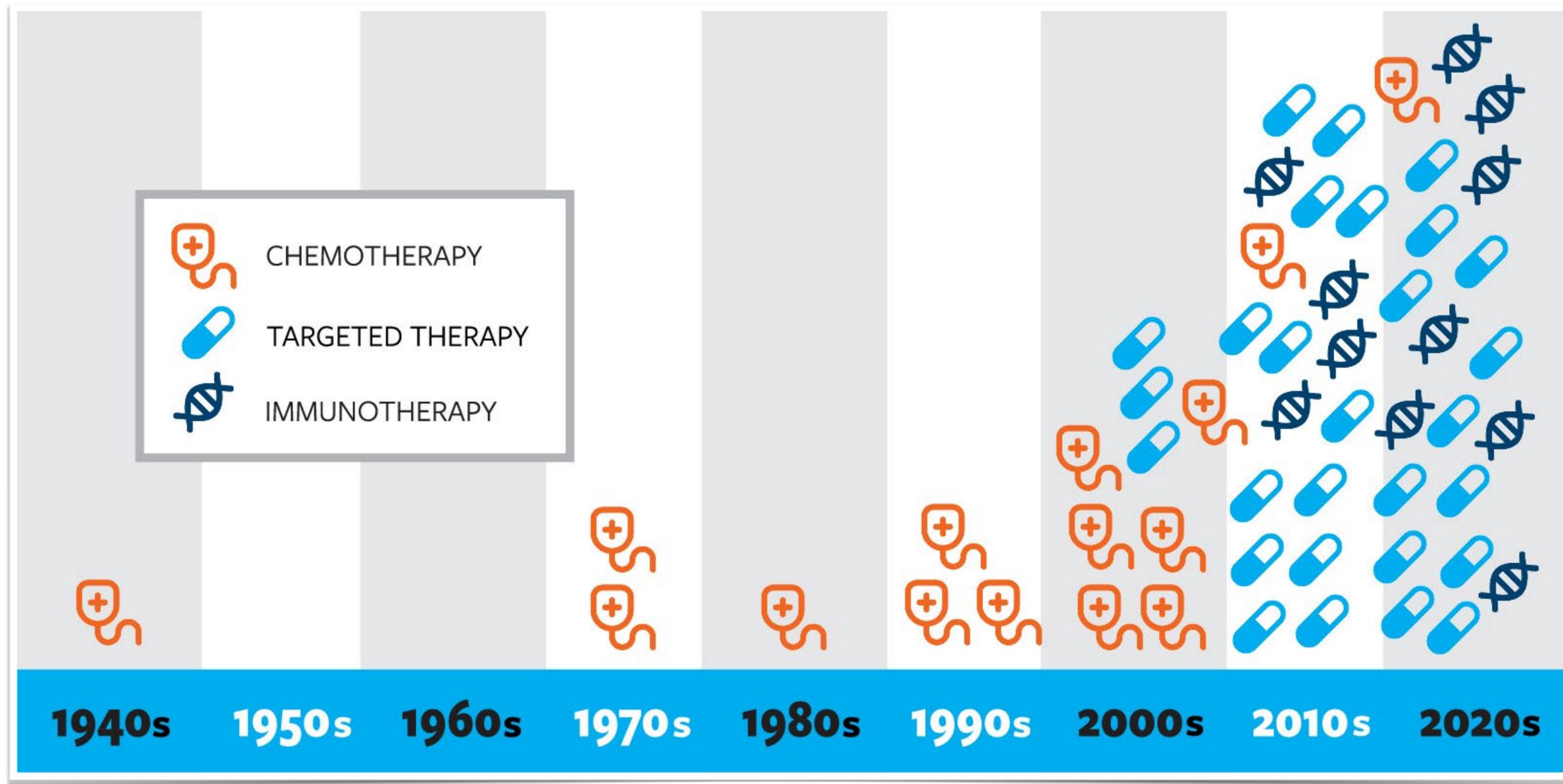
~\$1.4 to 1.8 Billion



<https://globalforum.diaglobal.org/issue/may-2019/what-are-the-chances-of-getting-a-cancer-drug-approved/>

<https://projectalpha.mit.edu/>

Soaring to new heights... or greater debt?

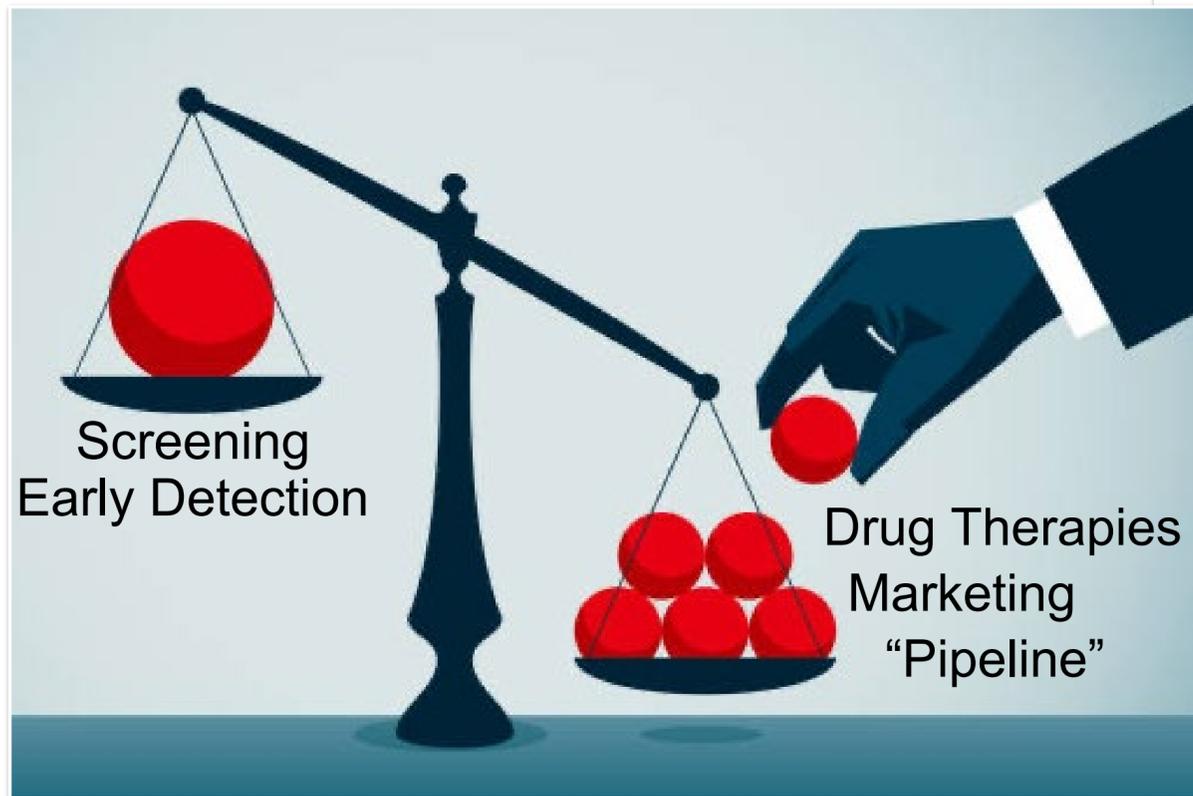


Estimated Global Market for Lung Cancer Drugs

What????

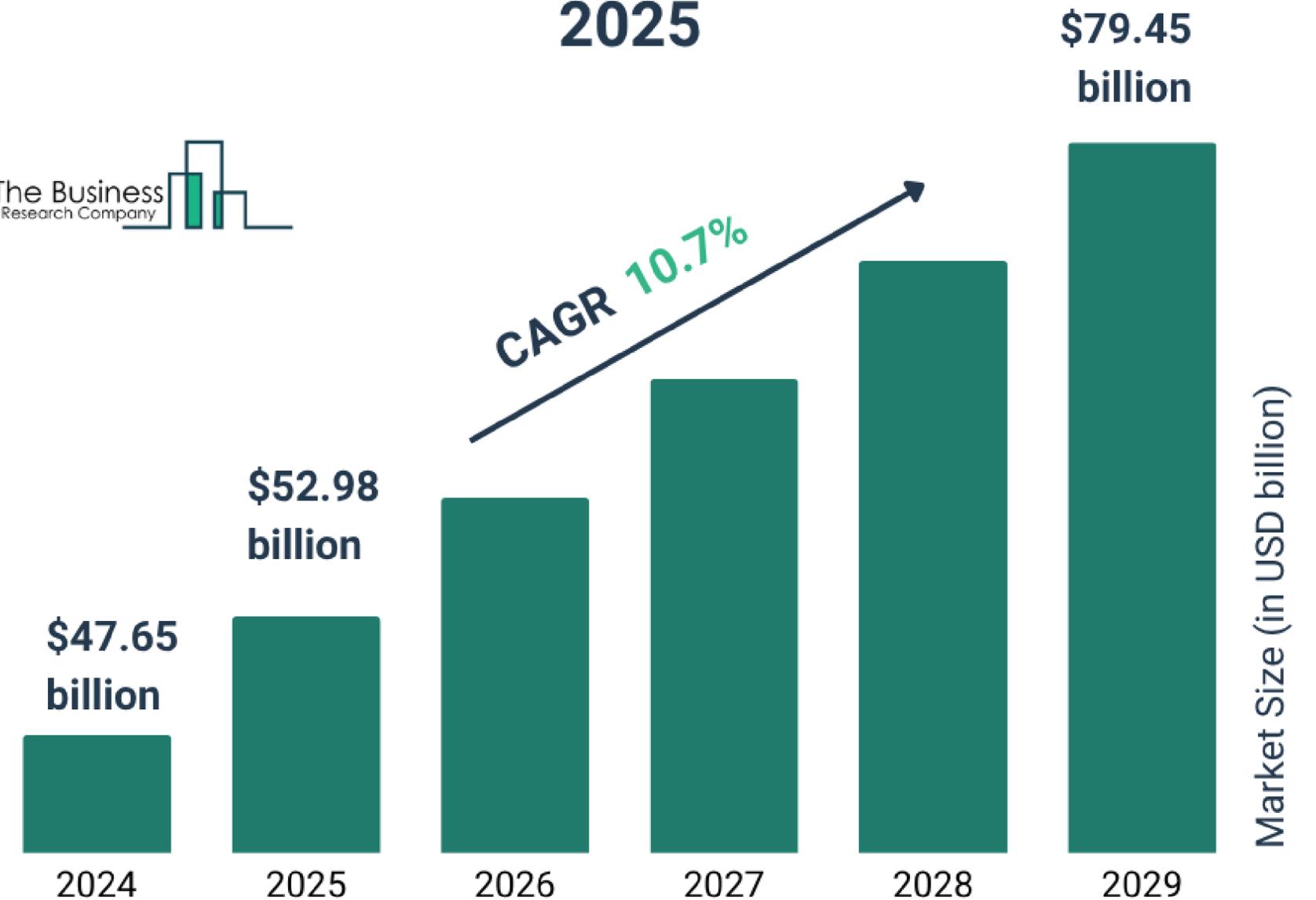
Projected \$80 Billion

“Unbalanced approach”



Lung Cancer Drugs Global Market Report 2025

The Business
Research Company



***What would happen if every person eligible
was screened and every IPN was managed...***



***We
would
need
less
infusion
chairs...***

Aligning Across Disciplines and Society

The Multidisciplinary Model

- Thoracic surgery, pulmonology, oncology (medical, radiation), pathology, radiology, palliative care, nursing, navigation, social work.
- “Coordinated” — *What does that mean?*

Lung Cancer Screening Programs

- Early detection depends on radiology + pulmonology + primary care + outreach.
- Community outreach as the “front door” to multidisciplinary care.

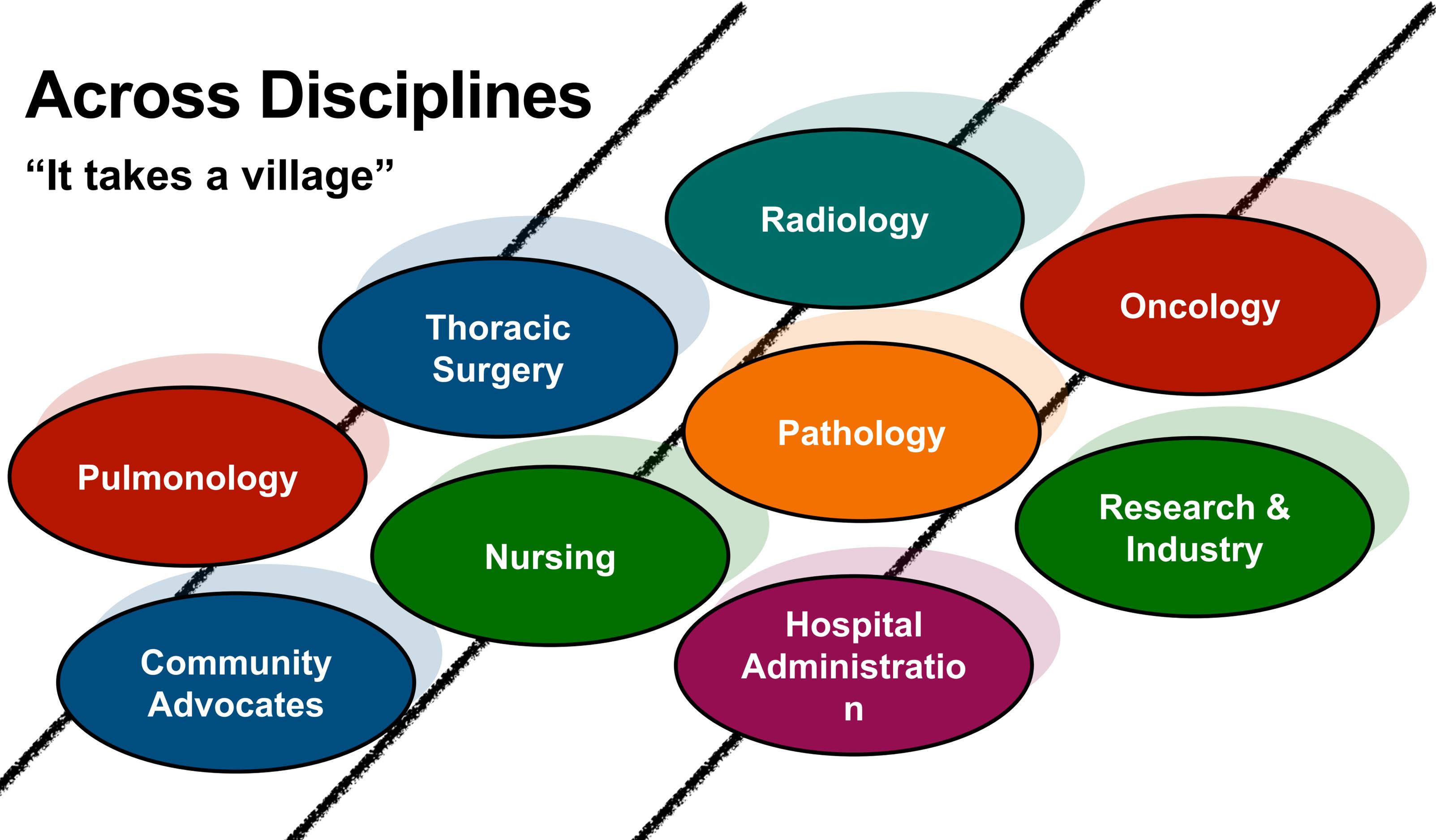
Systems Alignment

- Importance of hospital leadership, payers, and public health engagement.
- Tie in concept of *societal change* → *destigmatizing, prioritizing equity.*



Across Disciplines

“It takes a village”



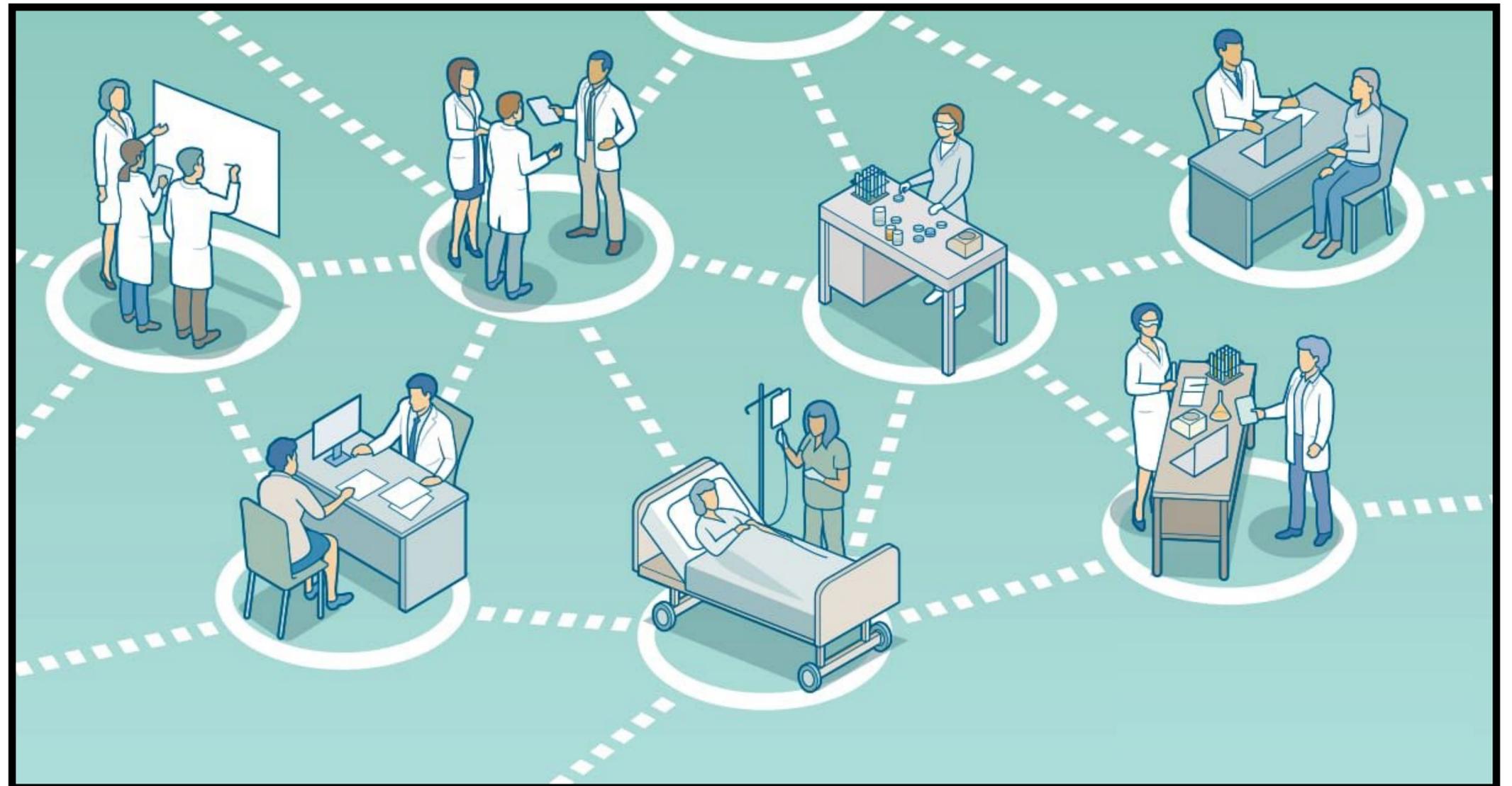
What does multi-disciplinary mean?

What is the most important portion of this image?

The dashes...

Nothing matters unless
there is:

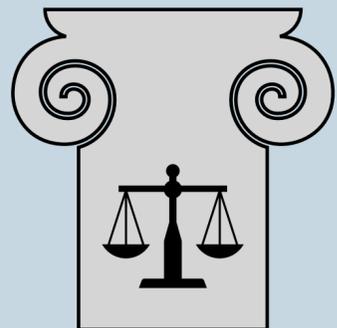
COMMUNICATION



Across Society...

Government

- Insurance(s)
- Coverage
- Payors
- Reimbursement



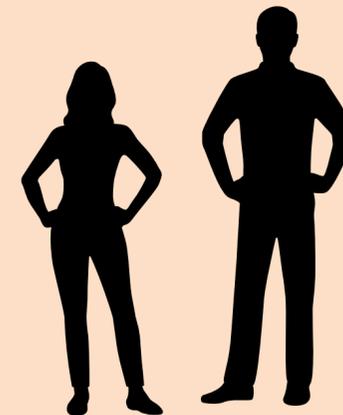
Associations

- Physician organizations
- Societies
- Nursing
- Healthcare Quality



Community

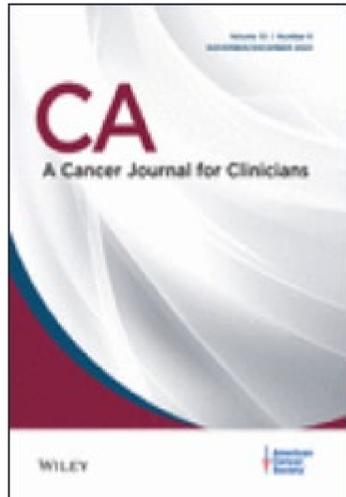
- Non-profits
- Advocacy
- Health Equity





Beyond the guidelines...





REVIEW ARTICLE

Lung cancer diagnosis and mortality beyond 15 years since quit in individuals with a 20+ pack-year history:
A systematic review

Karli K. Kondo PhD^{1,2}  | Basmah Rahman MPH¹  | Chelsea K. Ayers MPH³  |
Rose Relevo MLIS, MSMI¹ | Jessica C. Griffin MS¹  | Michael T. Halpern MD, PhD, MPH⁴

Nov 2, 2023

- The ACS Cancer Related Evidence Synthesis Team (CrEST) conducted a systematic review to better understand lung cancer incidence, risk and mortality among otherwise eligible individuals in the population beyond 15YSQ.
- From 2636 titles, 22 studies in 26 articles were included.
- **The CrEST team observed that the risk of lung cancer not only persists beyond 15 YSQ but that, compared with individuals who never smoked, the risk may remain significantly elevated for 2 or 3 decades.**

Lung cancer risk by years since quitting in 30+ pack year smokers

Paul F Pinsky, Claire S Zhu and Barnett S Kramer

J Med Screen
 2015, Vol. 22(3) 151–157
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 Reprints and permissions:
 sagepub.co.uk/journalsPermissions.nav
 DOI: 10.1177/0969141315579119
 msc.sagepub.com


Hazard ratios for never, current, and former smokers by YSQ

Duration probably matters more...

Table 2. Cox Proportional Hazards Model.

Smoking History Category	Person Years ¹	Lung Cancers	Rate per 10000 Person Years	HR (95% CI) controlling for age, sex
Never Smoker	779504	253	3.2	Referent
Current Smoker	36312	271	74.6	35.9 (29.0–44.5)
Former Smoker				
YSQ ≤ 5	12758	83	65.1	30.8 (23.4–40.5)
YSQ > 5–10	17615	90	51.1	22.1 (16.9–28.9)
YSQ > 10–15	39205	151	38.5	14.8 (11.9–18.2)
YSQ > 15–20	55422	236	42.6	13.5 (11.3–16.2)
YSQ > 20–25	47138	173	36.7	9.9 (8.1–12.0)
YSQ > 25–30	32163	101	31.4	8.1 (6.4–10.2)
YSQ > 30	36986	111	30.0	6.4 (5.1–8.0)
All	241287	945	39.2	–

~ 10-Fold Excess Risk

YSQ = years since quitting. HR = hazard ratio.

Only first 3 study years included for baseline current smokers and for former smokers with YSQ ≤ 5 at baseline.

¹For former smokers, person years at risk, number of lung cancers and rate were computed based on time-varying YSQ.

Lung Cancer Screening Eligibility

Does removing YSQ improve lung cancer screening outcomes?

- **Yes.**
 - *If all eligible individuals followed the guideline:*
 - *21% more lives saved*
 - *19% more life years gained.*

How many more people will be eligible for lung cancer screening under the ACS guidelines?

- *The 2023 ACS guideline increases the number to 14.3 - 19.2 million*
- *(32% - 43% of persons who ever smoked)*

Biased Data from the NSLT: Race Based Adjustments Needed

JAMA Oncology | [Original Investigation](#)

Evaluation of USPSTF Lung Cancer Screening Guidelines Among African American Adult Smokers

Melinda C. Aldrich, PhD; Sarah F. Mercaldo, PhD; Kim L. Sandler, MD; William J. Blot, PhD; Eric L. Grogan, MD; Jeffrey D. Blume, PhD

Using Prediction Models to Reduce Persistent Racial and Ethnic Disparities in the Draft 2020 USPSTF Lung Cancer Screening Guidelines

Rebecca Landy , PhD,^{1,*†} Corey D. Young, MS,^{2,†} Martin Skarzynski, PhD,¹ Li C. Cheung , PhD,¹ Christine D. Berg, MD,¹ M. Patricia Rivera, MD,³ Hilary A. Robbins , PhD,⁴ Anil K. Chaturvedi, PhD,¹ Hormuzd A. Katki, PhD^{1,*}

Persistent race- and sex-based disparities in lung cancer screening eligibility

 Check for updates

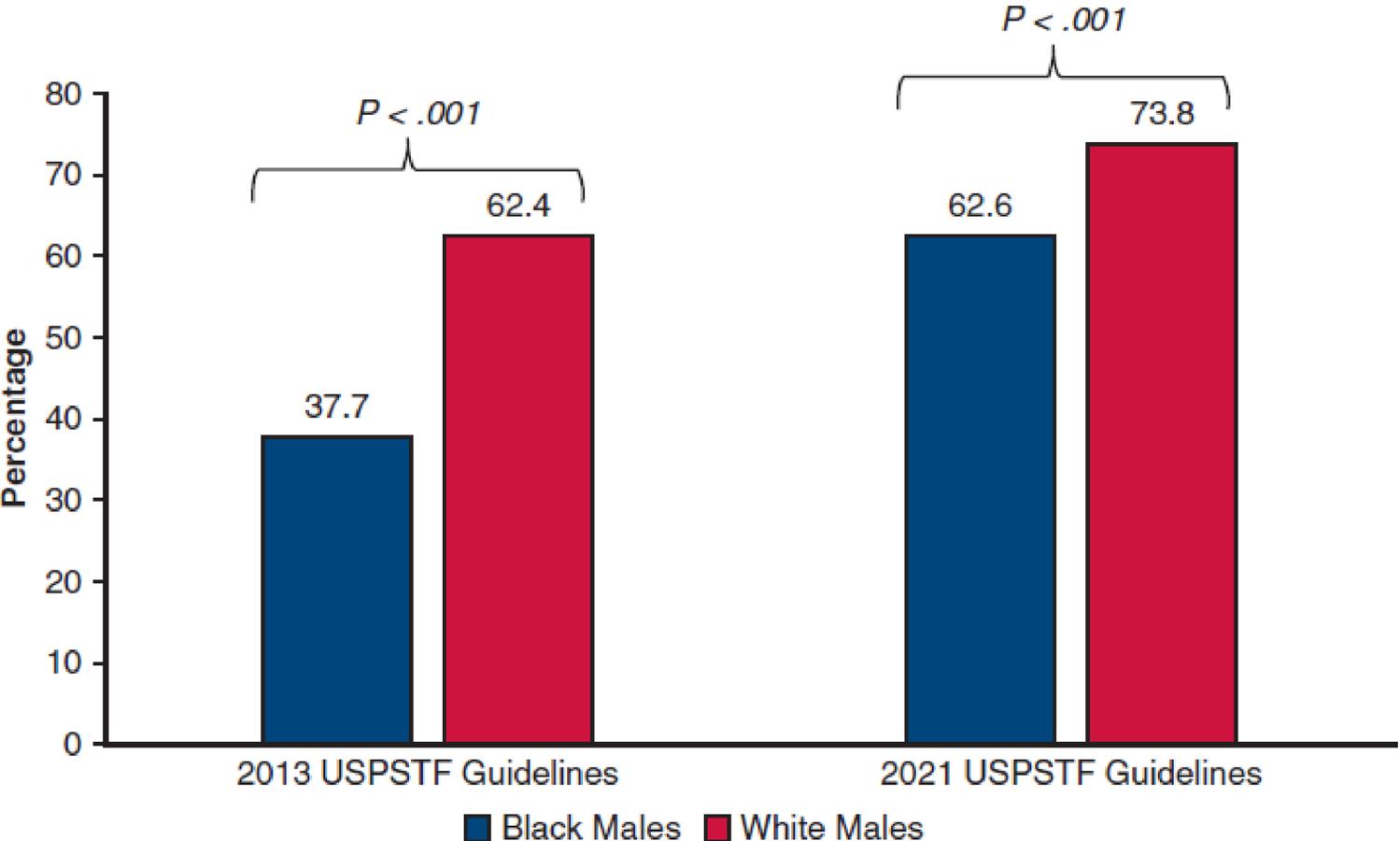
Alexandra L. Potter, BS,^a Priyanka Senthil,^a Deepti Srinivasan, BS,^a Vignesh Raman, MD, MPH,^b Arvind Kumar, BS,^c Chinmay Haridas, MBBS,^a Camille Mathey-Andrews, MD,^a Wei Zheng, MD, PhD,^{d,e} and Chi-Fu Jeffrey Yang, MD^a

Pack-Year Smoking History: An Inadequate and Biased Measure to Determine Lung Cancer Screening Eligibility

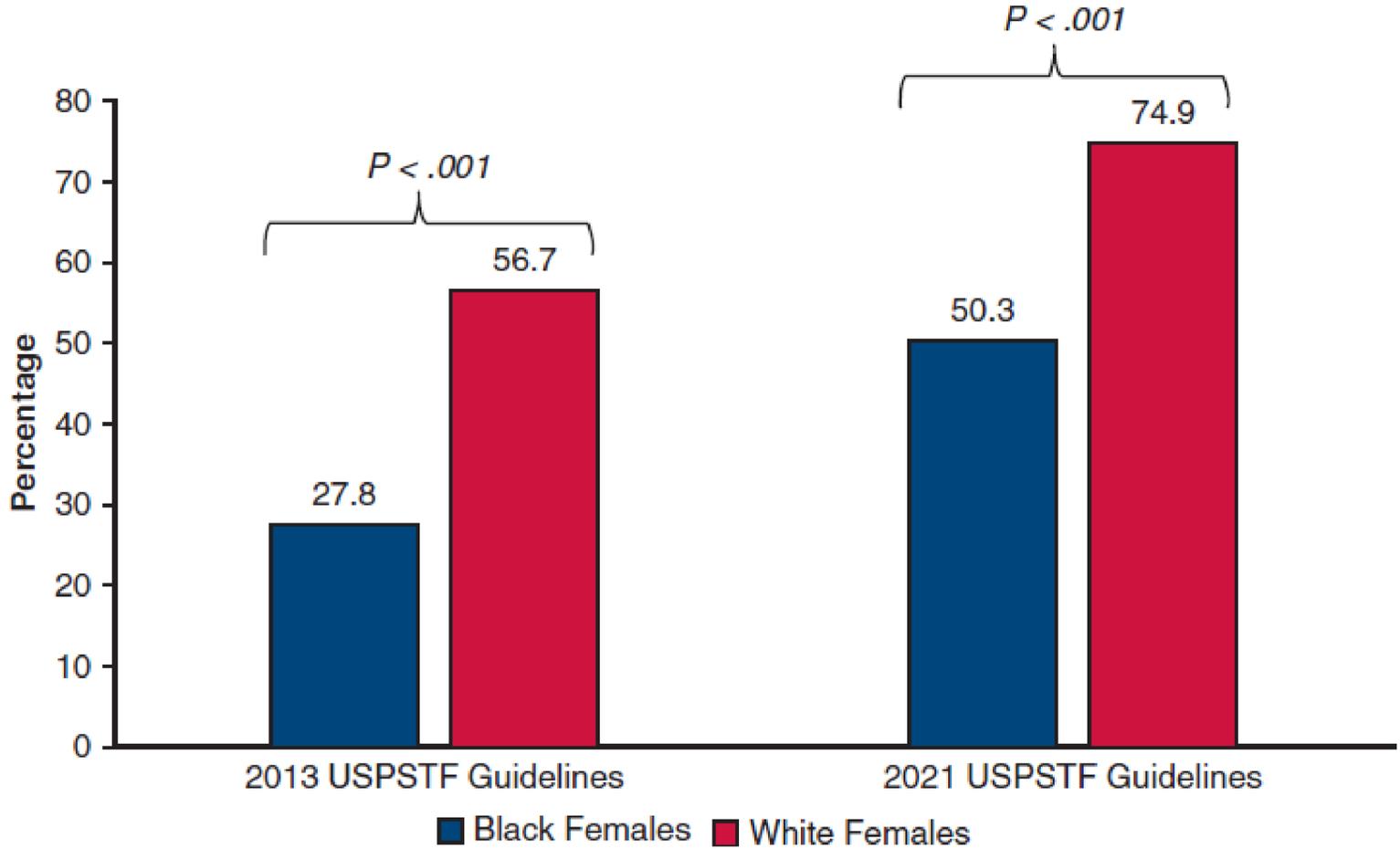
Alexandra L. Potter, BS¹; Nuo N. Xu, MSPH² ; Priyanka Senthil¹ ; Deepti Srinivasan, BS¹; Hang Lee, PhD³; G. Scott Gazelle, MD, MPH, PhD^{4,5}; Lydia Chelala, MD⁶ ; Wei Zheng, MD, MPH, PhD^{7,8} ; Florian J. Fintelmann, MD⁴ ; Lecia V. Sequist, MD, MPH⁹ ; Jessica Donington, MD¹⁰; Julie R. Palmer, ScD² ; and Chi-Fu Jeffrey Yang, MD¹ 

Proportion of Black versus White men and women **diagnosed with lung cancer** in the SCCS *who would have been eligible for lung cancer screening under the 2013 versus 2021 USPSTF lung cancer screening recommendations*

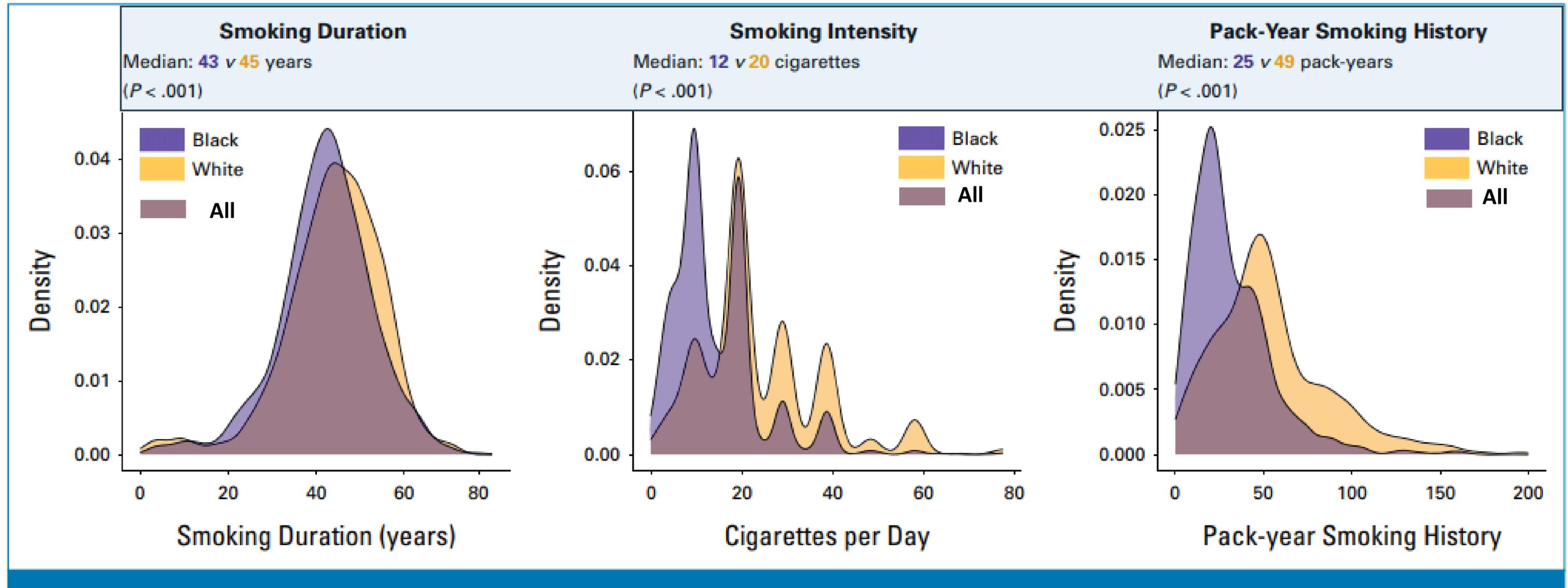
Males



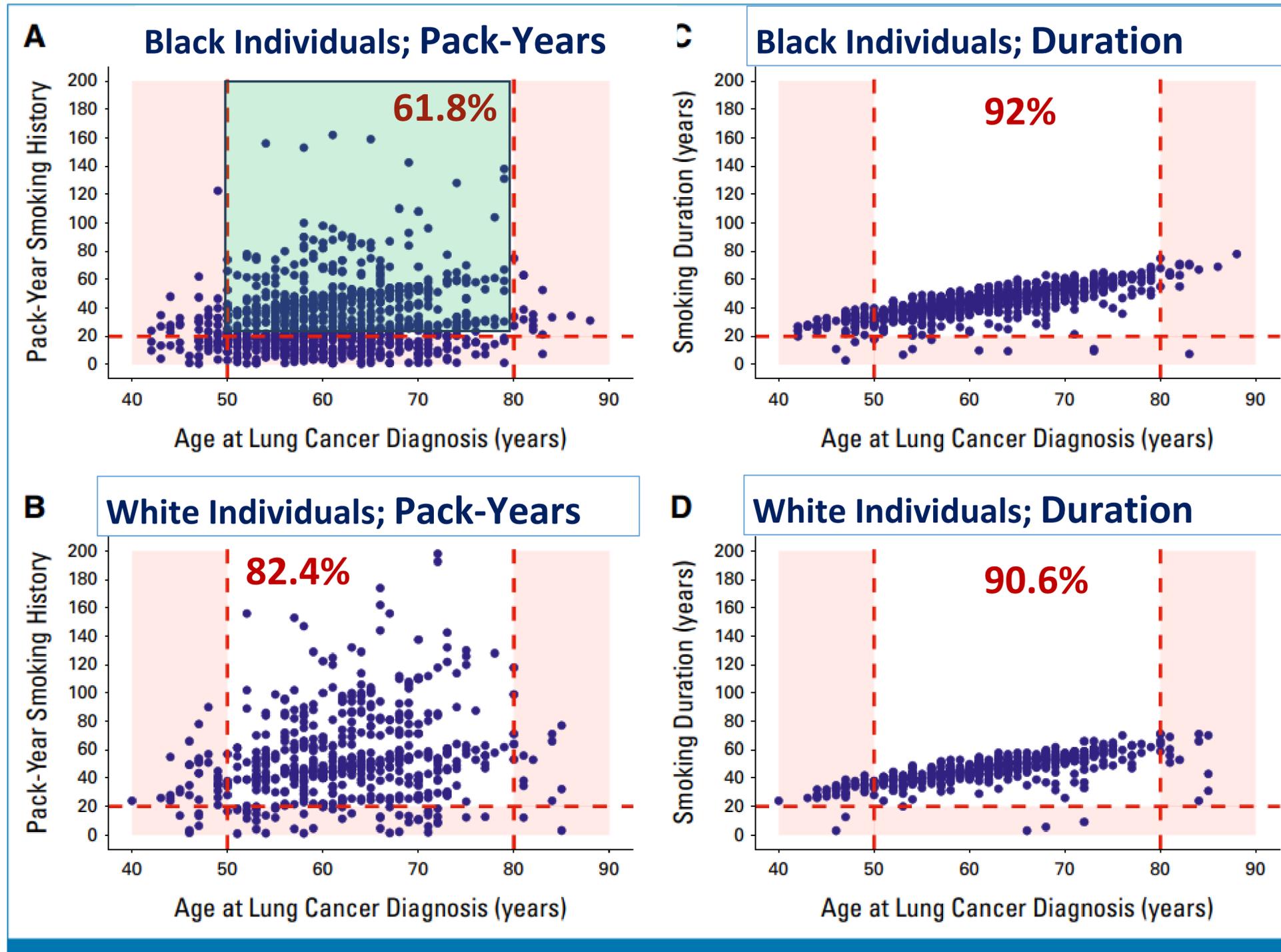
Females



Distribution of smoking duration (**years**), smoking intensity (**cigarettes per day**), and **pack-year smoking history** among Southern Community Cohort Study (SCCS) **participants diagnosed with lung cancer**.



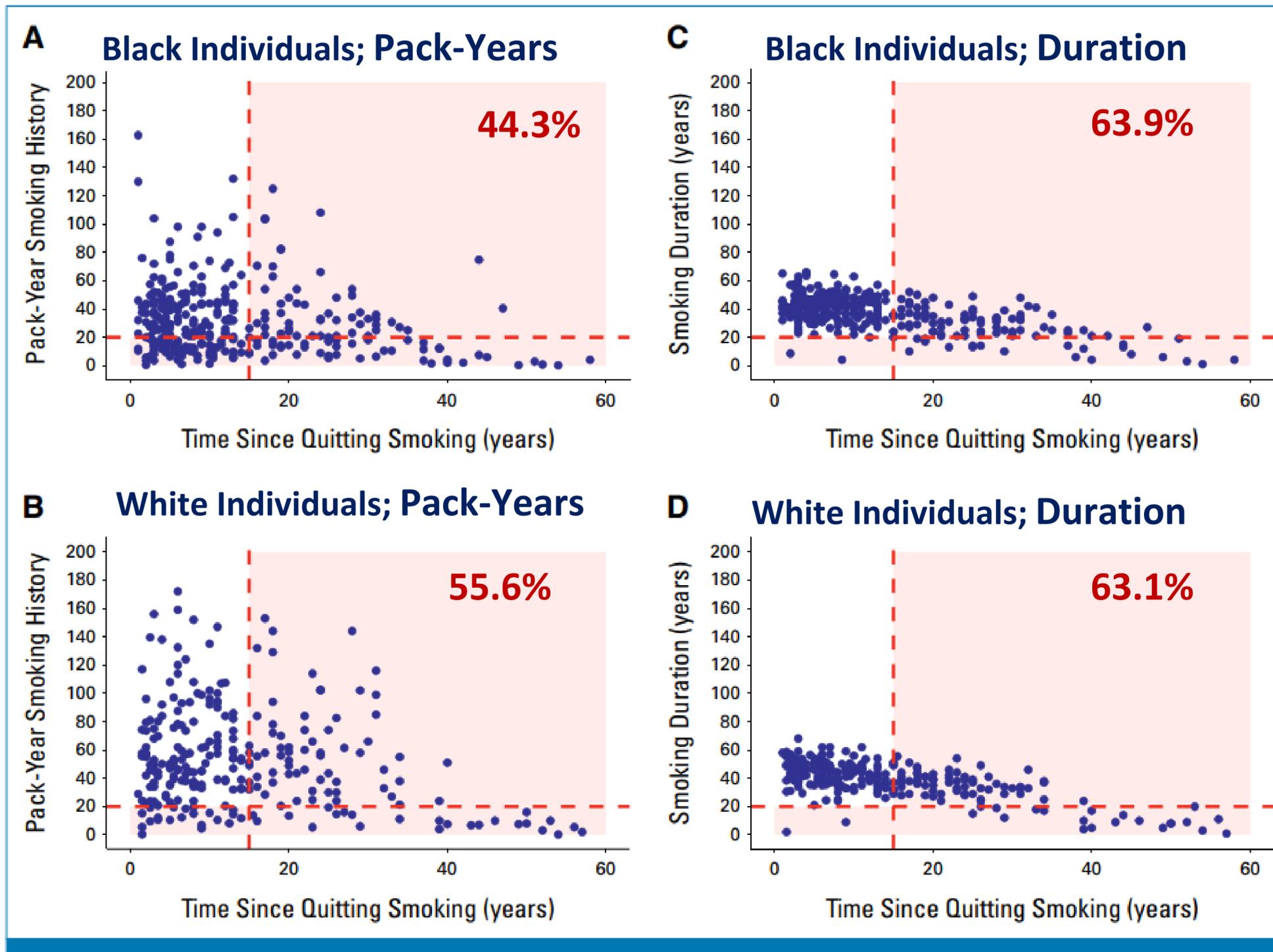
Scatterplots of percent eligibility for screening by **pack-year smoking history versus age at lung cancer diagnosis (A and B)** and **smoking duration versus age at lung cancer diagnosis (C and D)** among SCCS participants with lung cancer who currently smoked at the time of diagnosis, stratified by race.



A & B— 20 PACK-YEARS
61.8% of Black participants
Eligible vs
82.4% of White participants
($P < .001$).

C & D—DURATION (20+ yrs)
92% of Black participants
Eligible vs
90.6% of White participants
($P = .35$).

Scatterplots of pack-year smoking history versus years since quitting smoking (A and B) and smoking duration versus years since quitting smoking (C and D) among SCCS participants with lung cancer who formerly smoked at the time of diagnosis, stratified by race



A & B—PACK-YEARS... Only 44.3% of Black participants would have been eligible vs. 55.6% of White participants ($P = .008$).

C & D--DURATION..... With a 20+ year smoking duration criterion, 63.9% of Black participants ($P < .001$) and 63.1% of White participants ($P < .001$)

Screening of special populations?

Occupational Cancers

- **Fire Fighters** - 14-20% increased risk
 - Inhaled Polyaromatic hydrocarbons
- **Military Special Operations**
 - Burn pits, locations, chemicals
 - 1 in 7 post-911 Veterans dx w/ Cancer



TASK FORCE DAGGER
SPECIAL OPERATIONS FOUNDATION

Screening for Non-Smokers

Risks for development of lung cancer

- Radon (Second leading cause)
- Exposure to secondhand smoke, Woodstove, Biomass fuel
- Occupational carcinogens (Asbestos, Aluminum, Chromium, Nickel, Steel, Paint)
- Air pollution (Smog, inner city)
- Chronic obstructive pulmonary disease
- Prior lung infections (h/o TB)
- Interstitial lung diseases
- H/o Lung Transplant (2nd leading COD)
- Age, Genetic predisposition



FANSS Study (NCT5164757)

- New York Female Asian Non-smoker Screening Study (NY **FANSS**)
- Currently Recruiting
- 1000 Asian Females
- 40-74 yo
- <100 cigarettes in a lifetime
- **Preliminary Data WCLC 2023**
 - 1.5% Lung Cancer
 - All EGFR+



Centralized Lung Screening Programs

Increased adherence

- CHEST September 2025
 - Meta analysis of 12 studies
 - 17,000+ patients
 - 3.33X Odds of annual adherence
 - +effects of care coordinators
 - +centralized follow up mtg



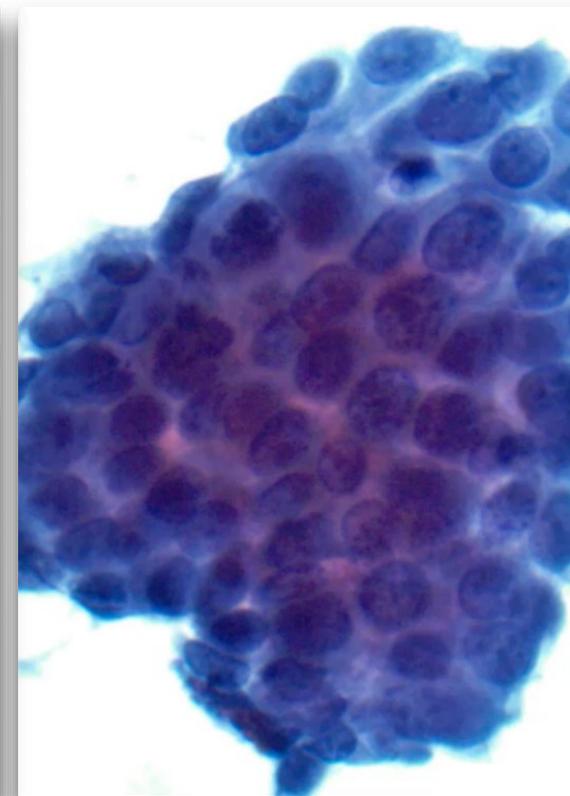
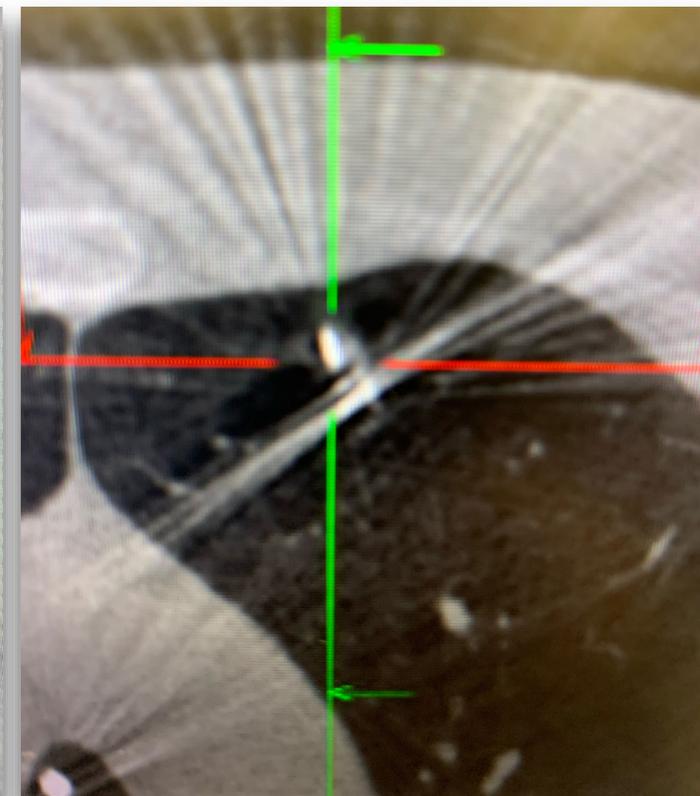
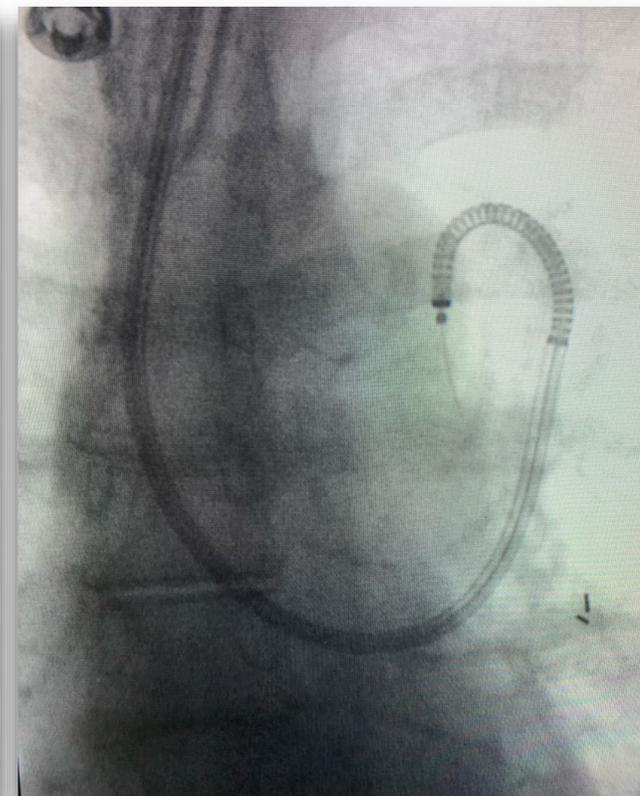
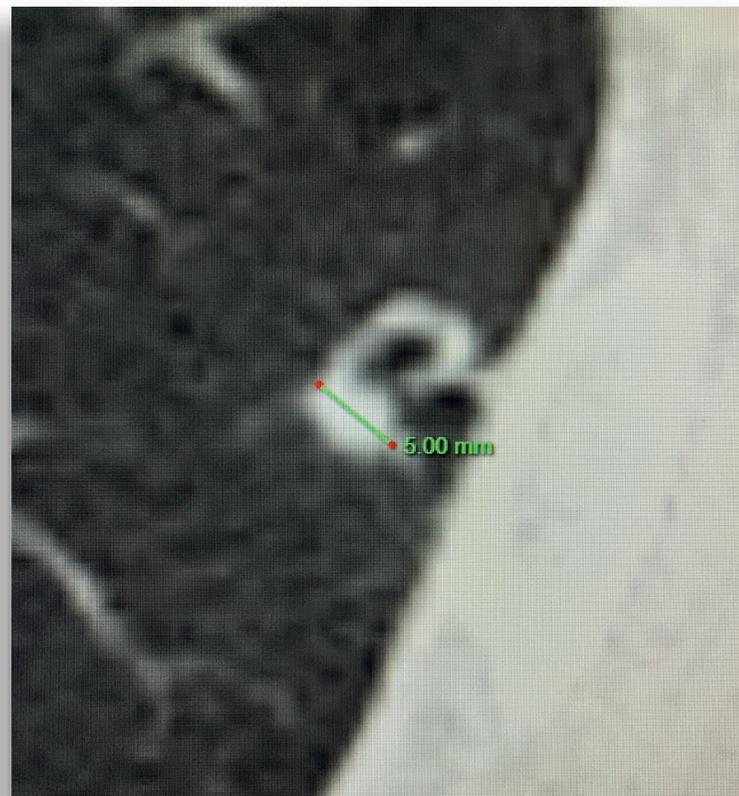
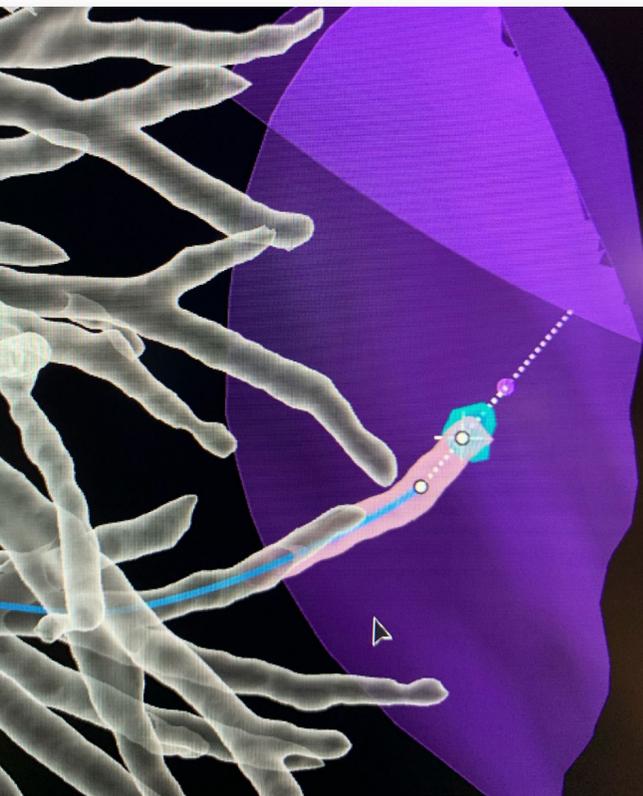
Has our technology has outpaced the guidelines...

... According to [LinkedIn](#)....



What can an ION robot reach?

ANYTHING!!!

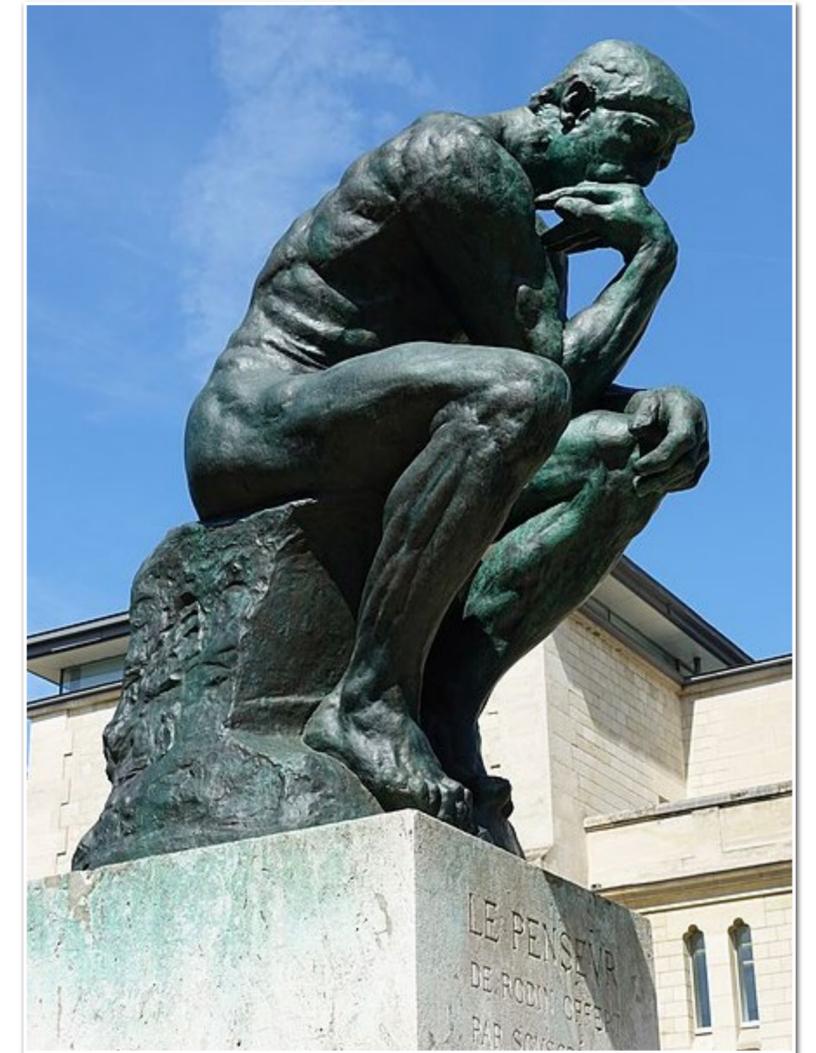


But, should we...?

Just because we can biopsy it should we?

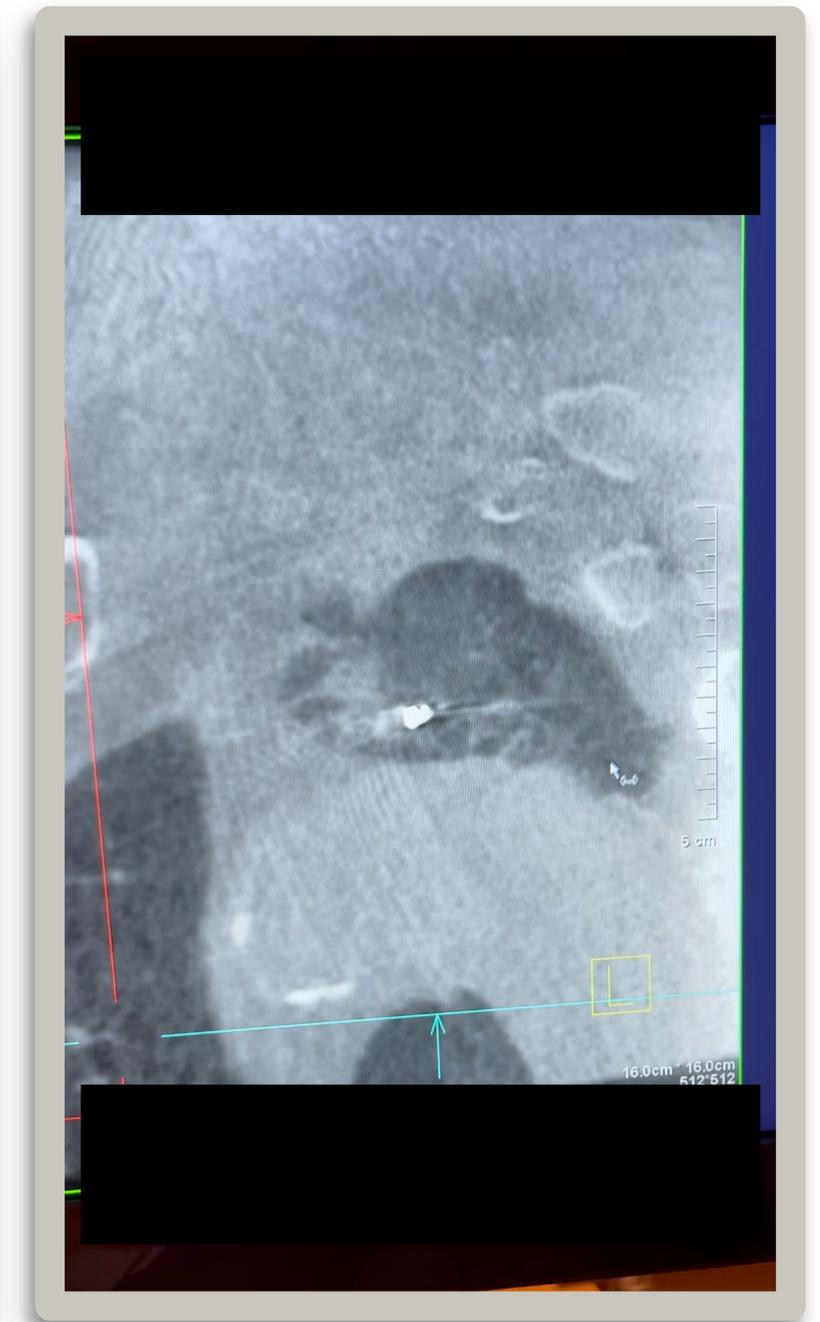
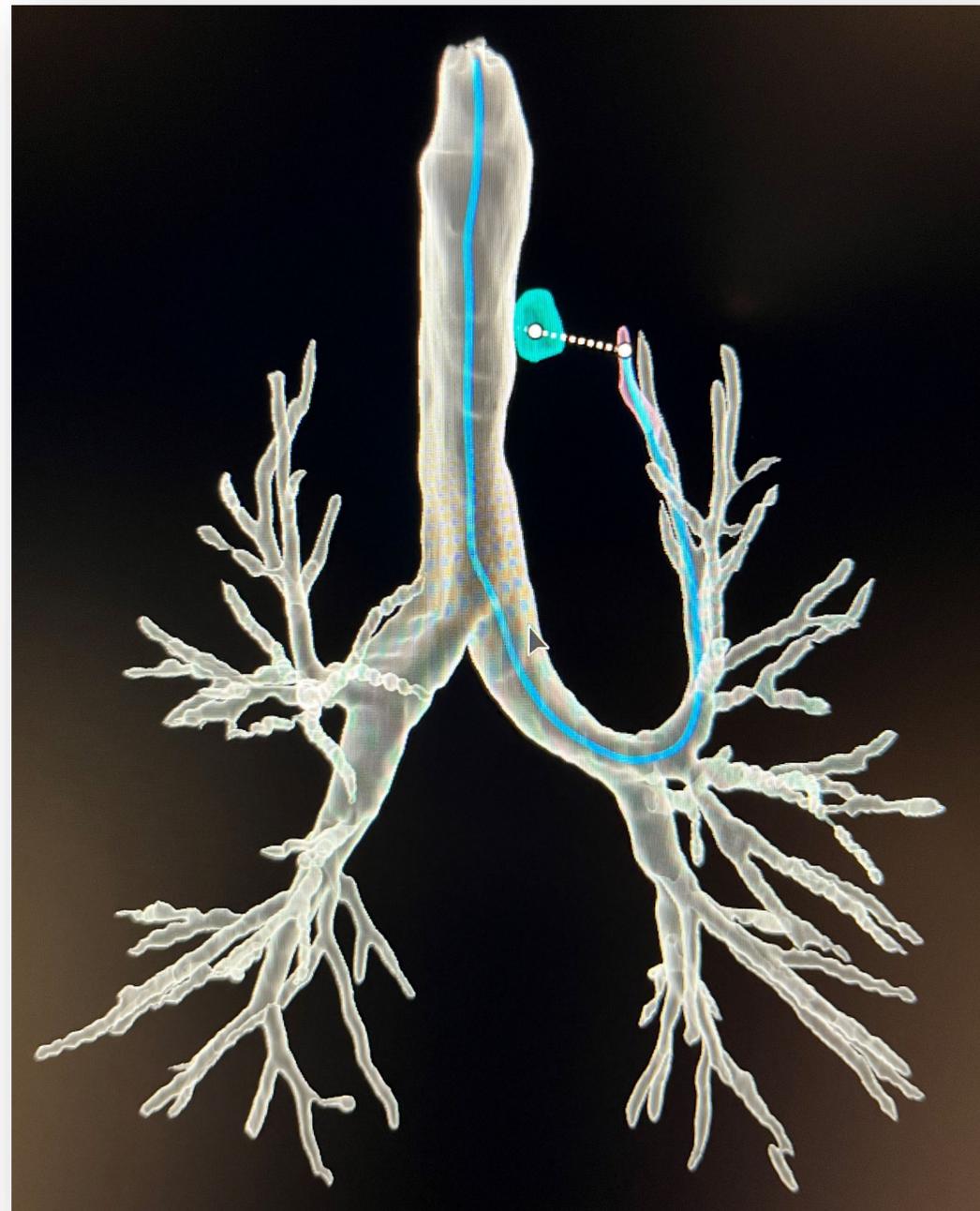
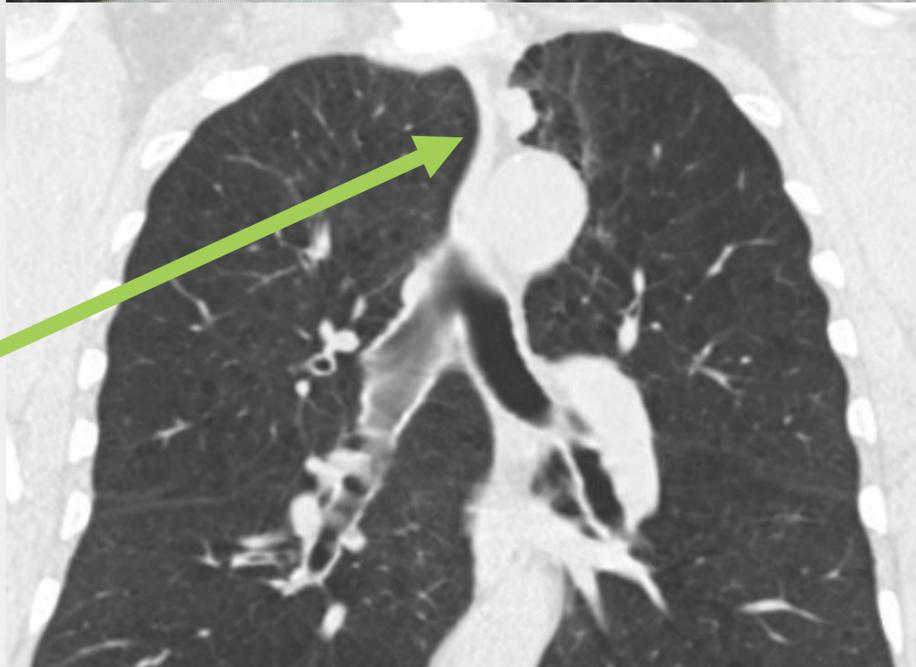
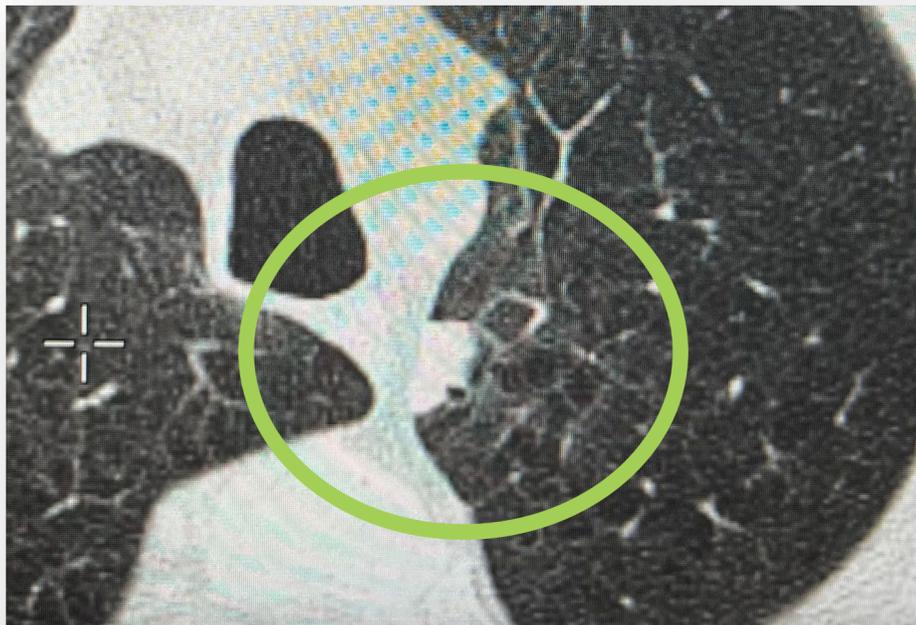
***Cost of care, non-diagnostic
cases, co-morbid conditions,
complications... guidelines...
payors***

The list goes on...

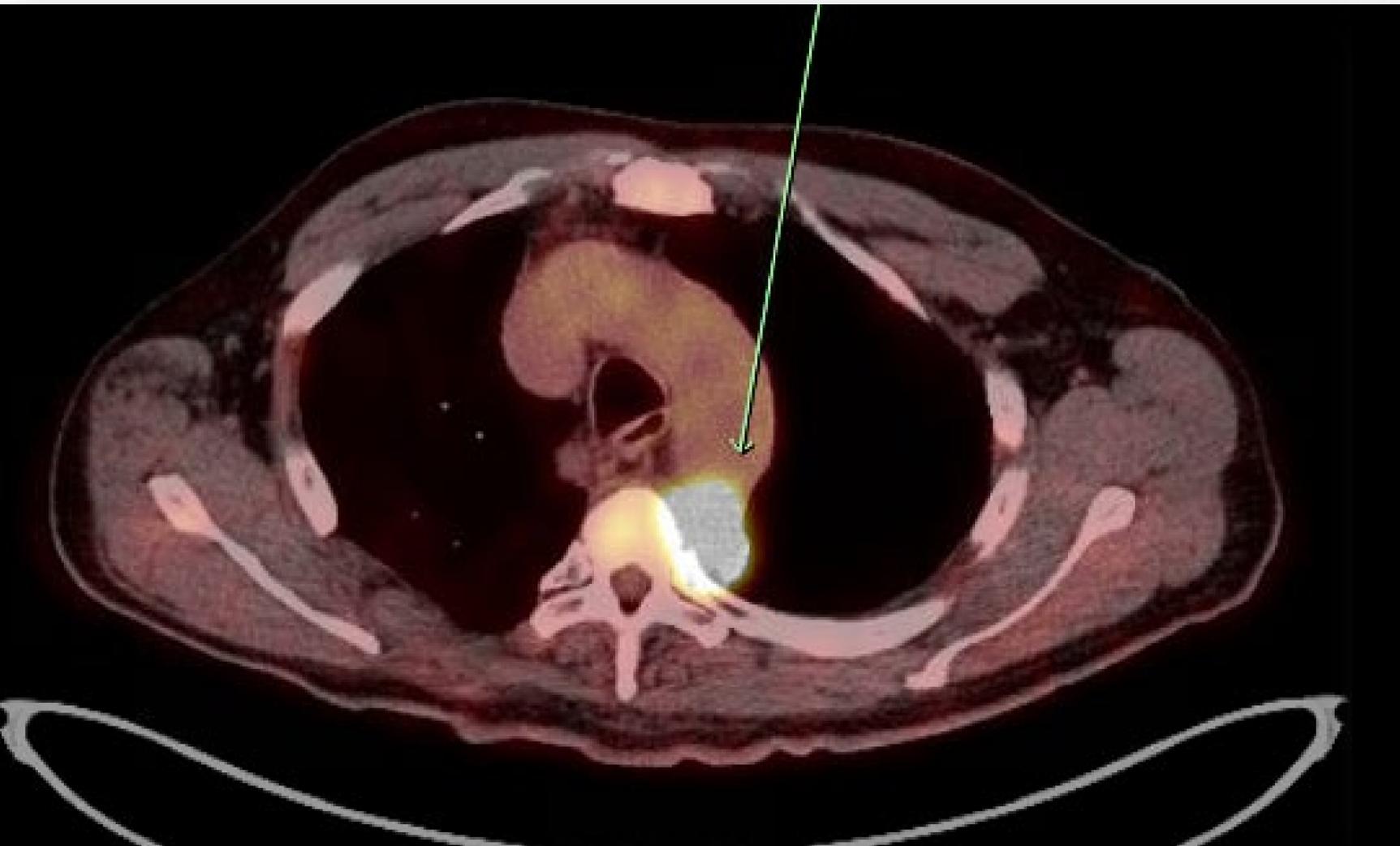


***“Le Penseur”
The Thinker***

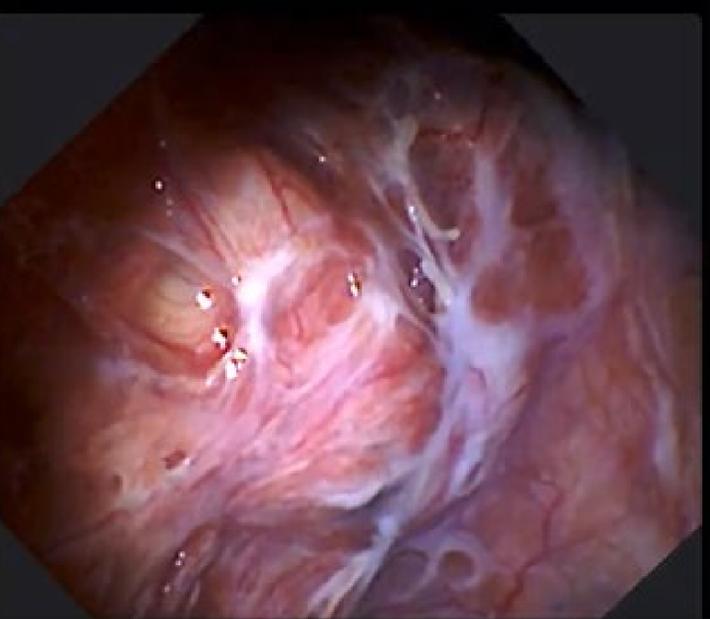
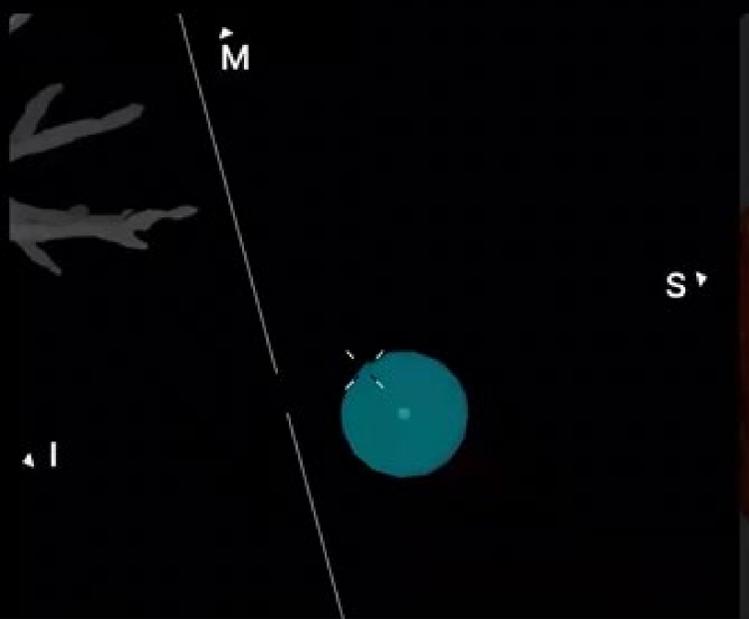
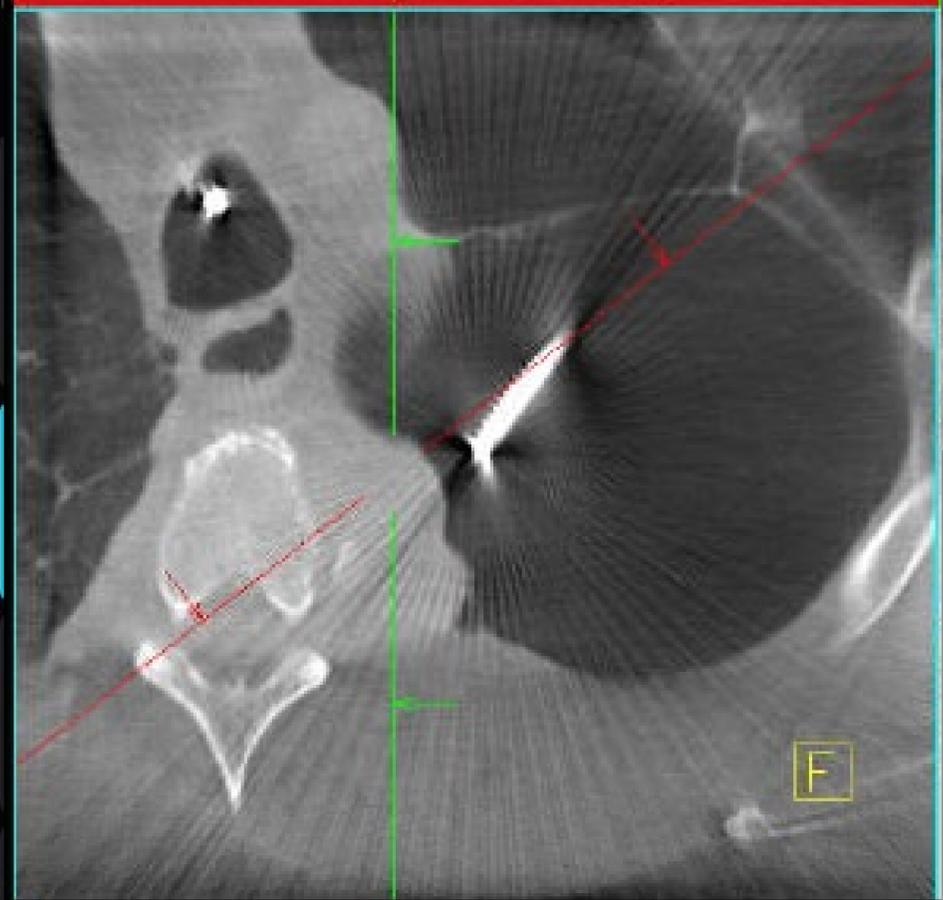
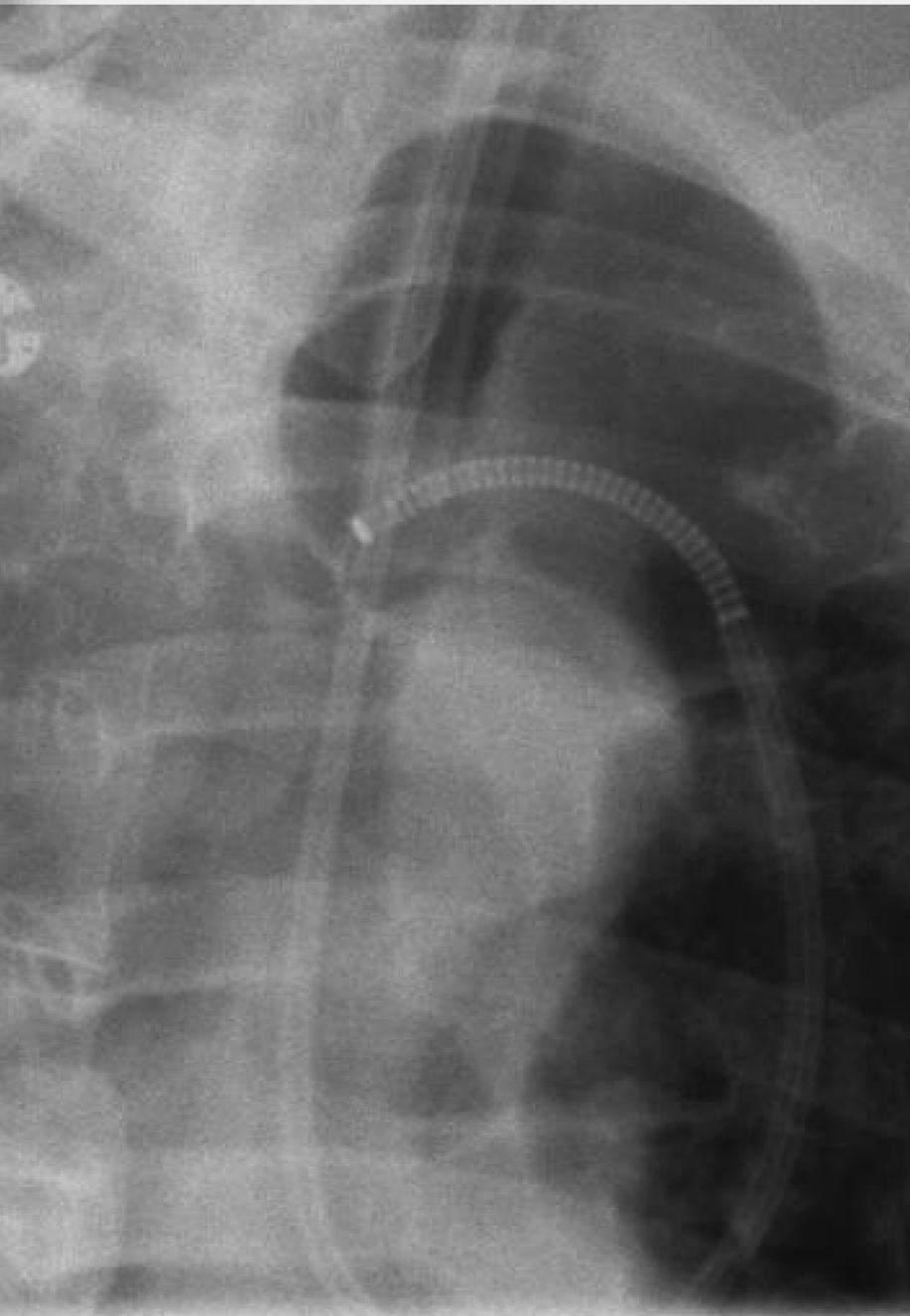
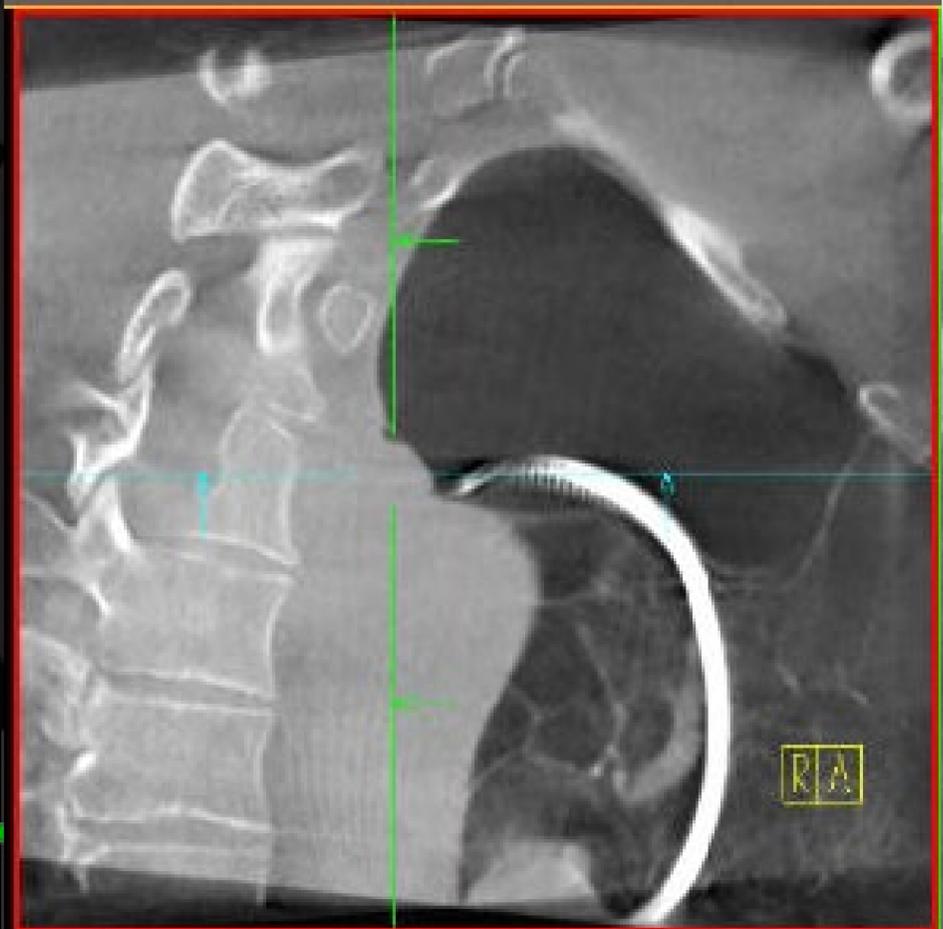
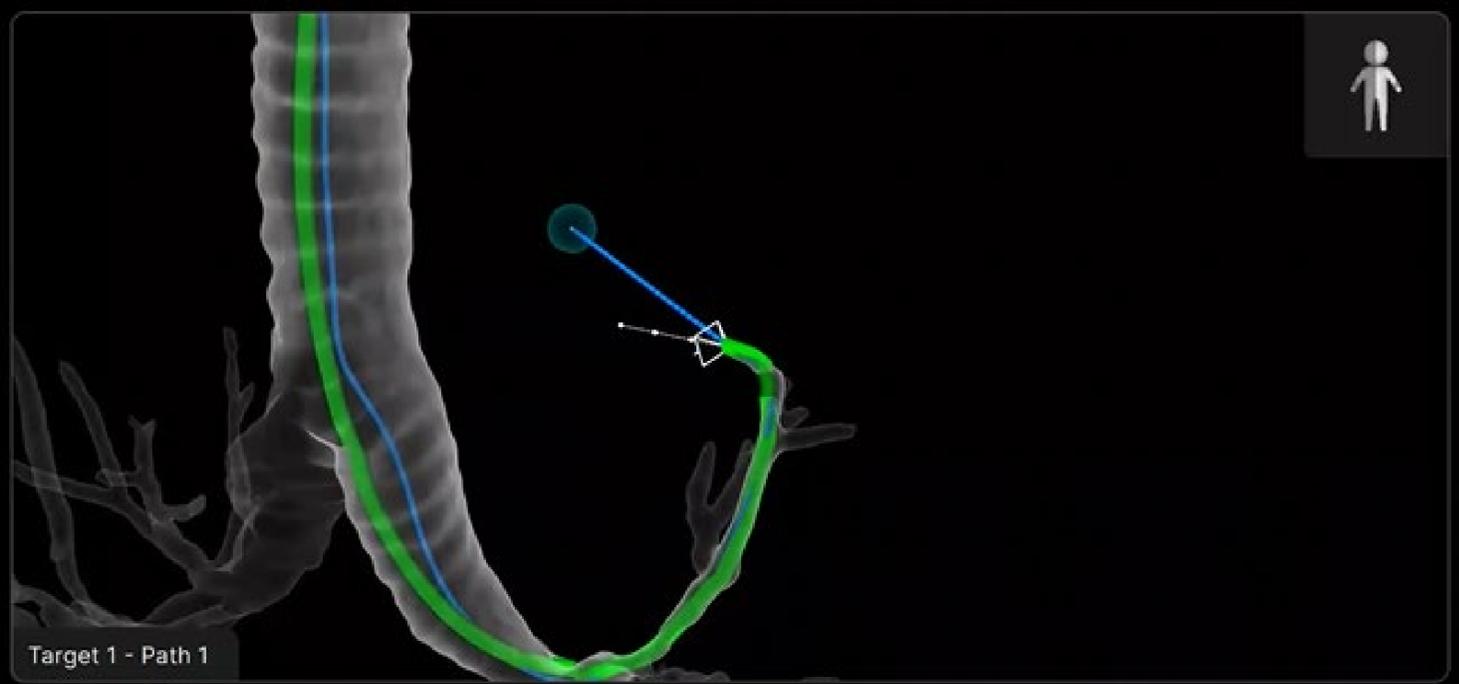
LUL Supra-aortic 18mm



Bullous Disease vs Chest Wall



Images: Bradley Icard, DO



Images: Bradley Icard, DO



Family...

We must not loose sight...

Patients...



Community Outreach

...boots on ground... relationships





**American College
of Radiology™**

“2025 ~16% up from 4.5% 2023”

**Leverage your
connections... and
educate...**

“Public awareness... woefully low”



July 14, 2025

The Honorable Robert F. Kennedy Jr.
Secretary of Health and Human Services
U.S. Department of Health and Human Services
200 Independence Avenue, S.W.
Washington, D.C. 20201

Submitted electronically: Secretary@HHS.gov

Dear Secretary Kennedy:

The American College of Radiology (ACR) ¹ encourages HHS to launch a public health awareness campaign to promote annual lung cancer screening for individuals at high risk of developing the disease. More than 230,000 people in the United States will be diagnosed with lung cancer this year, and approximately 125,000 will die from the disease.² Lung cancer remains the leading cause of cancer death in the United States, claiming more lives annually than breast, prostate, and colorectal cancers combined.

A significant number of lung cancer deaths could be prevented if current screening recommendations were adopted, allowing for early detection of lung cancer at its most treatable stages. The life-saving benefits of low dose CT (LDCT) screening in at-risk populations are well documented; in fact, 20-30% more lives could be saved if high-risk patients were referred for regular screening.³ Accordingly, LDCT screening of high-risk individuals is recommended by the American Cancer Society, the American Lung Association, the American College of Surgeon's Commission on Cancer, the National Comprehensive Cancer Network, the U.S. Preventive Services Task Force, and many other medical and scientific organizations.

Although Medicare and nearly all private payers cover lung cancer screening, public awareness of this life-saving screening benefit is woefully low. As of the most recent data from 2024, the lung cancer screening rate in the U.S. is approximately 16% among eligible individuals.⁴ While this marks a significant increase from previous years, up from just 4.5% in 2023, this still means 84% of eligible individuals are not being screened and are missing opportunities for early

¹ The ACR is a professional association representing more than 40,000 physicians practicing diagnostic radiology, interventional radiology, radiation oncology, and nuclear medicine, as well as medical physicists.

² American Cancer Society. Cancer Facts & Figures 2025. Atlanta: American Cancer Society; 2025.

³ Rolle LD, Olazagasti C, Lopes G, Rodriguez E, Crane TE. USPSTF Lung Cancer Screening Guidelines and Disparities in Screening Adherence. JAMA Oncol. [Published online](#). March 20, 2025. doi:10.1001/jamaoncol.2025.0230

⁴ American Lung Associations (ALA) report: [2024 State of Lung Cancer](#). Retrieved July 8, 2025.

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38% of the population

American Lung Association National Survey



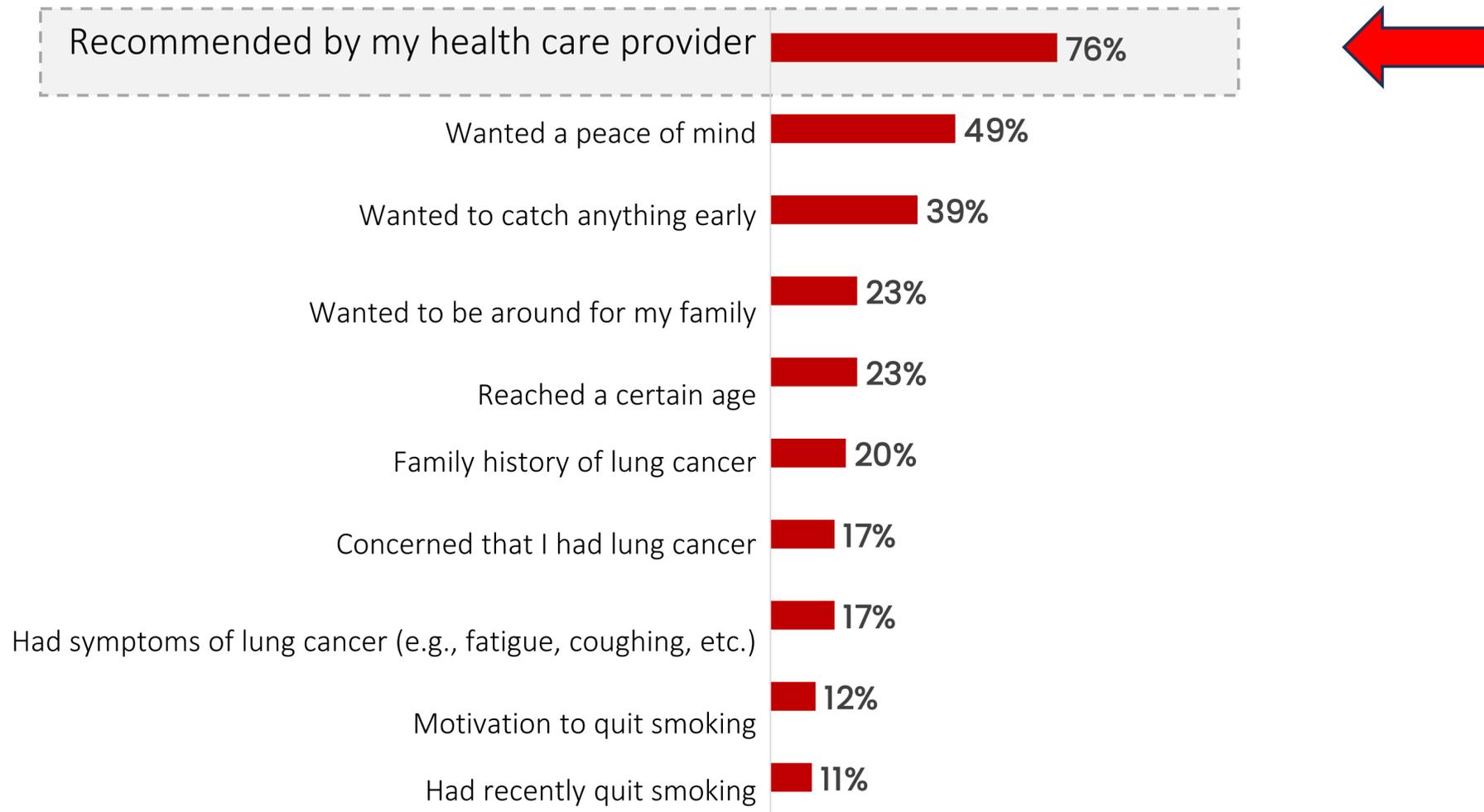
According to the 2024 Lung Health Barometer, only 38% of respondents were familiar with the availability of lifesaving lung cancer screening.

Why People Get Screened

Top 10 Triggers for Getting Screened

Among Previously Had LDCT Scan

Patients trust their health care providers to have their best interest and health in mind and are more likely to get screened if a doctor recommends it.



Which of these, if any, are reasons why you personally got screened for lung cancer?

Previously Had LDCT Scan: n=75*

*Caution: Low base size



No single clinician, specialty, or technology can solve this.

It takes a village.



Thank You!
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