



Maryland Tobacco Control Resource Center 19th Annual Best Practices Conference

Tobacco and Lung Cancer

Taofeek K. Owonikoko, MD, PhD

Greenebaum Distinguished Professor and Executive Director

Associate Dean, UM School of Medicine

Associate Vice President, University of Maryland Baltimore

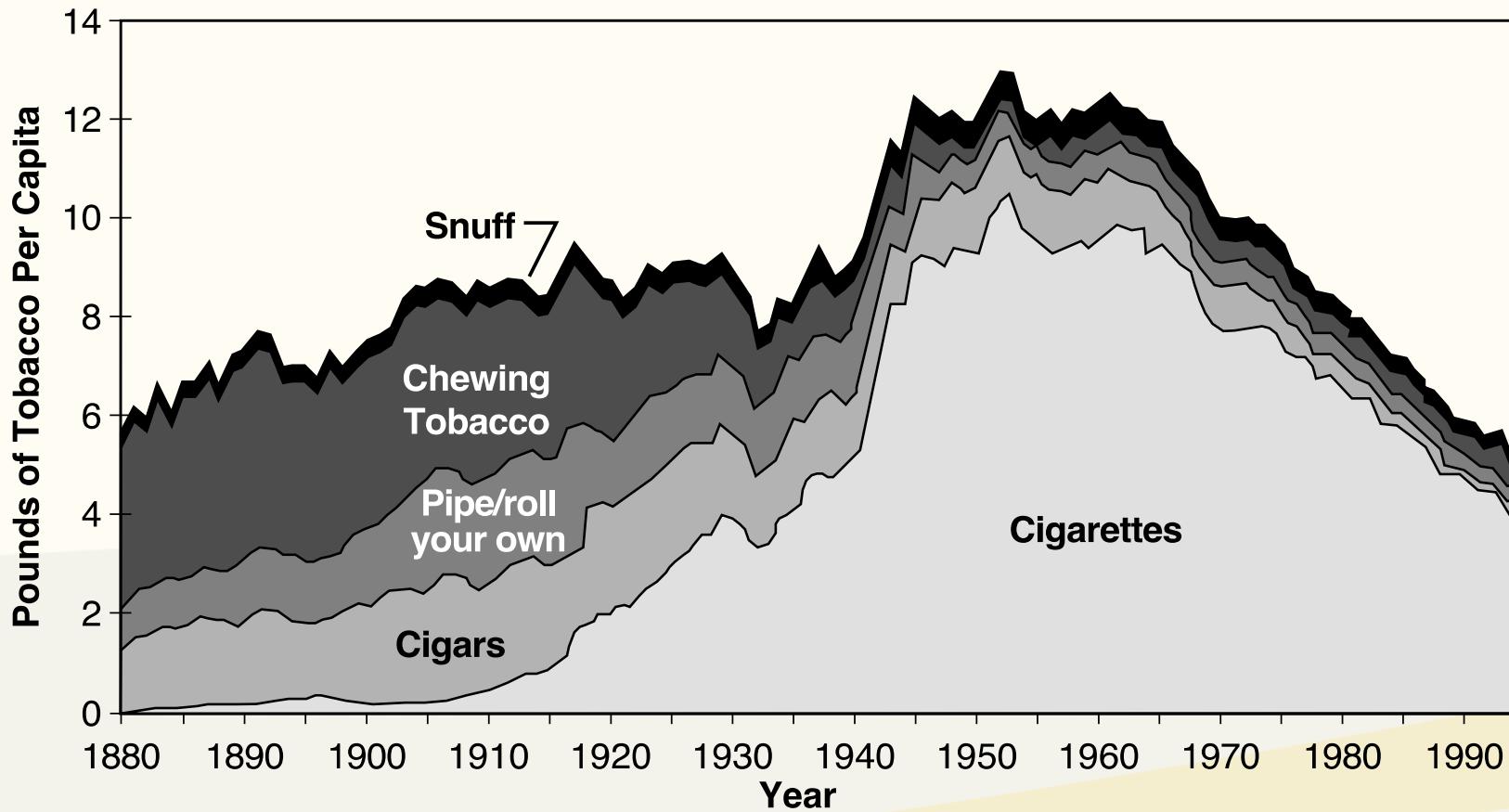


Disclosure Information

- **Paid Advisory Board:** Novartis; Lilly; Amgen; AstraZeneca; Boehringer Ingelheim; EMD Serono; Bayer; Roche/Genentech, Inc.; Merck; Jazz Pharmaceuticals; Daiichi Sankyo; Janssen; BeiGene; Genentech; Coherus Biosciences; GenCART; Heat Biologics; Meryx; Puma Biosciences; GSK, Gilead, Regeneron, Betta Pharmaceuticals; OncoHost; Boehringer Ingelheim
- **Research Funding to Institution:** Amgen Inc.; AstraZeneca; Bayer Corporation; Cardiff Oncology, Inc.; Roche/Genentech, Inc.; Merck & Co., Inc.; Novartis Pharmaceuticals Corporation; Y-mAbs Therapeutics, Inc; Daiichi Sankyo; Puma Biosciences; Cyclacel; GSK; Boehringer Ingelheim
- **IRC/DSMB:** EMD Serono, Roche/Genentech
- **Co-founder or Stock Ownership:** Cambium Oncology; Taobob LLC/Coherus Biosciences; GenCART;

Historical evolution of tobacco use in the US

Per capita consumption of different forms of tobacco in the United States, 1880-1995



Source: U.S. Department of Agriculture, 1996.

1884:
Invention of a
machine to
manufacture
cigarettes

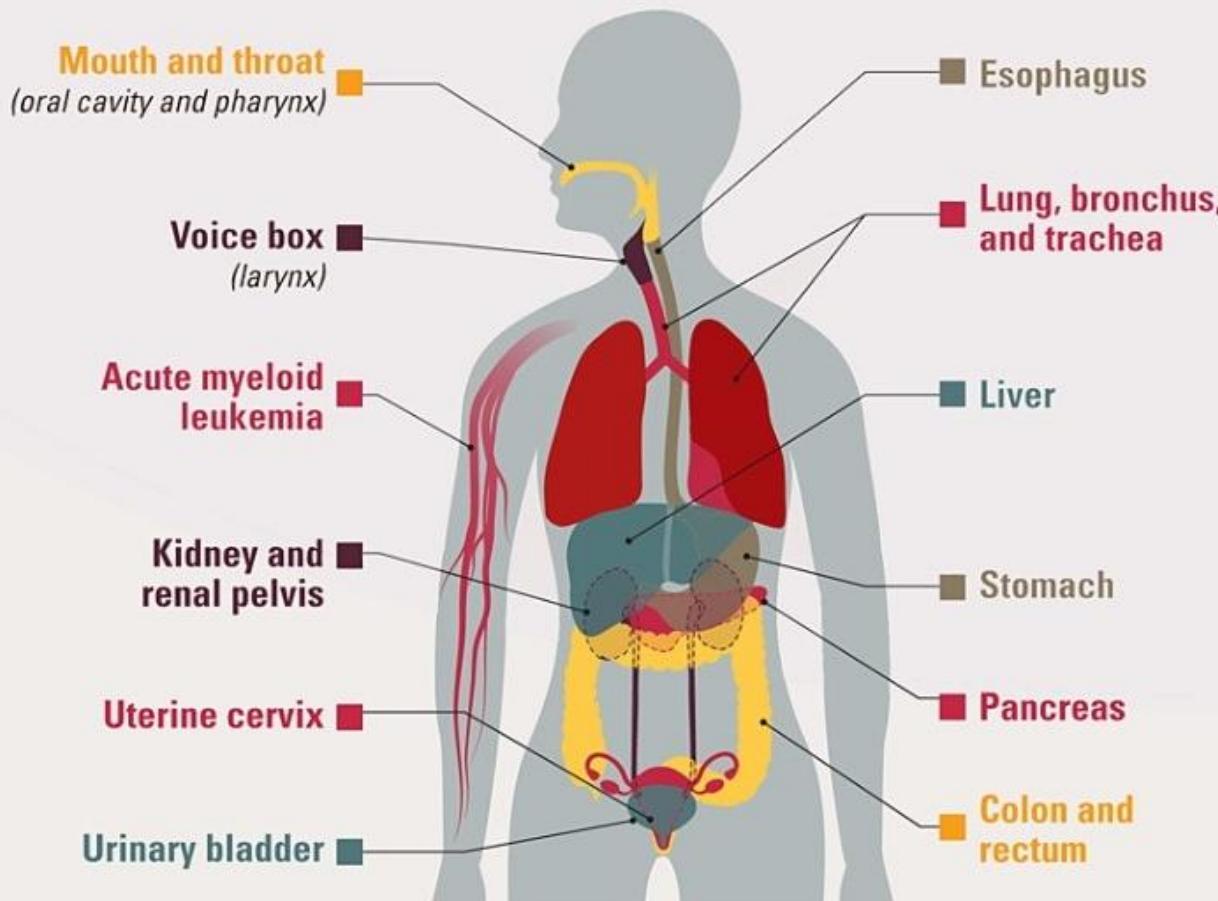
1913:
Mass marketing
of cigarette

1928:
Introduction of
cigarette
advertising
targeting
women

1955:
Marketing of
filtered
cigarettes

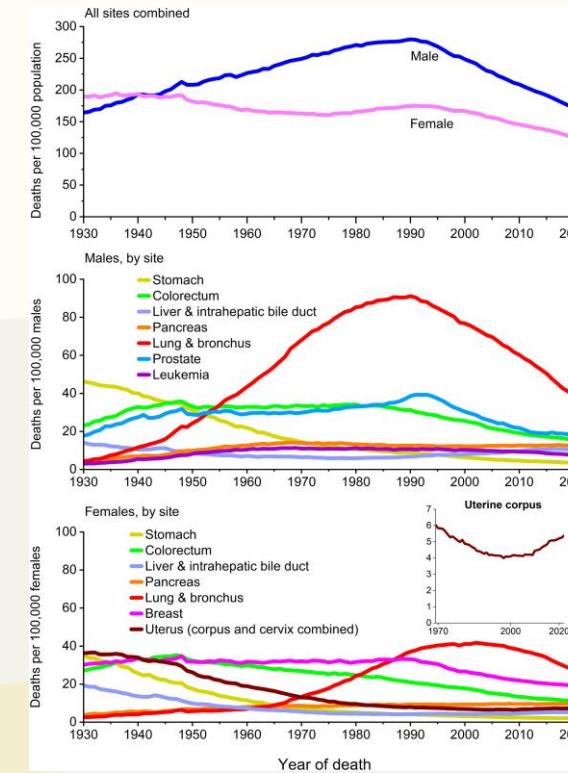
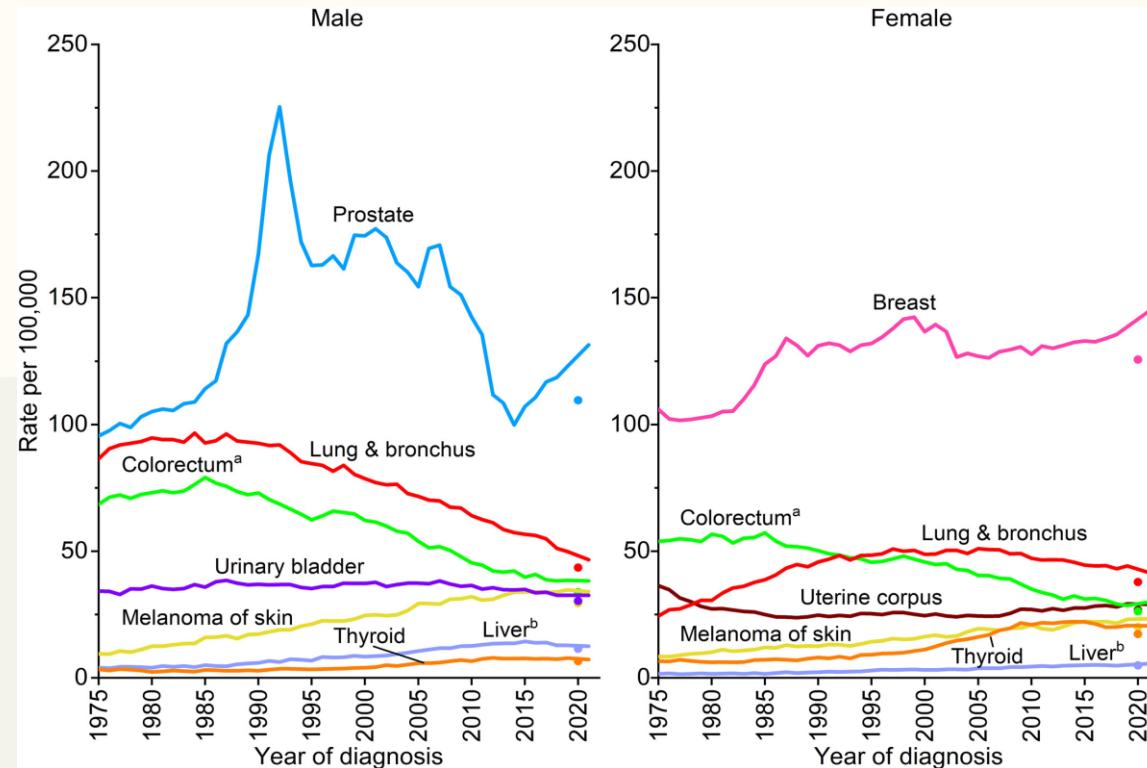
1970:
Counter-
advertising and
eventual ban on
cigarette
adverts

Tobacco use* causes cancer throughout the body.



* Tobacco use includes smoked (cigarettes and cigars) and smokeless (snuff and chewing tobacco) tobacco products that, to date, have been shown to cause cancer.

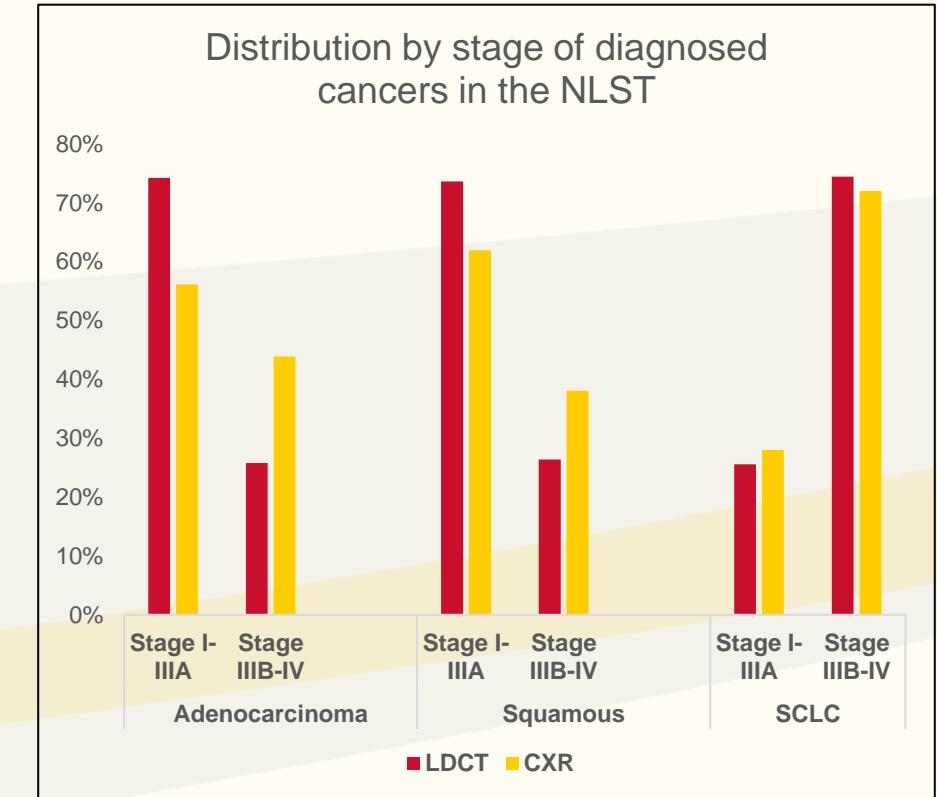
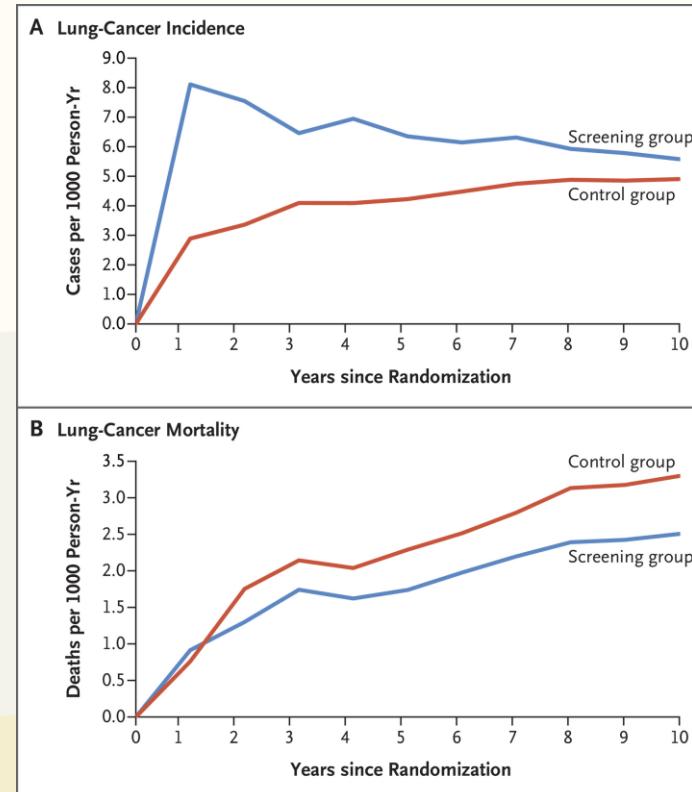
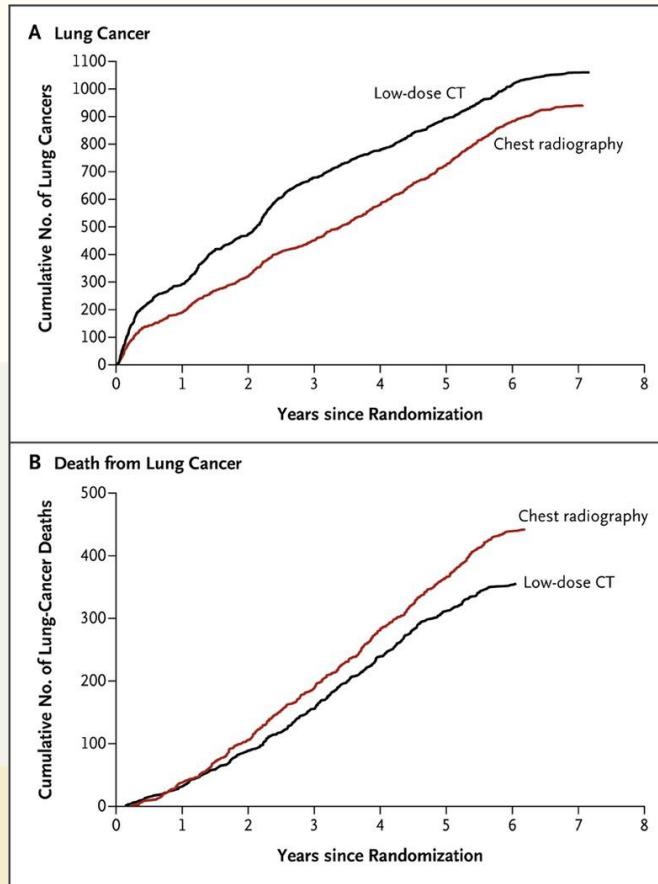
Trends in lung cancer by gender



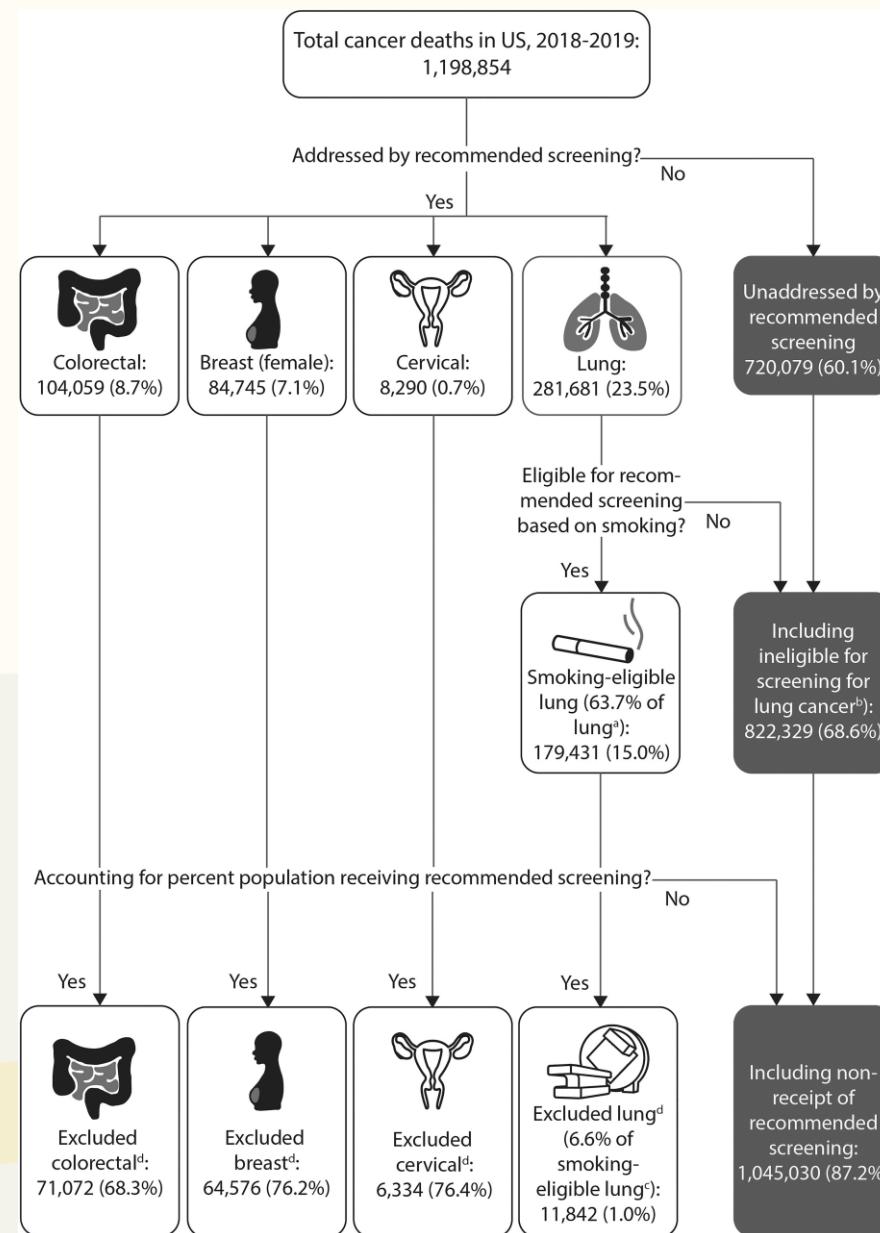
- Lung cancer incidence declined over the past decade (2012–2021) by 3% per year in men and 1.4% per year in women
- The downturn began in women in 2010 and in men in 1995
- Women took up cigarette smoking in large numbers later and also slower to quit

Current LDCT screening guideline

NLST and NELSON trials not effective for early detection of SCLC

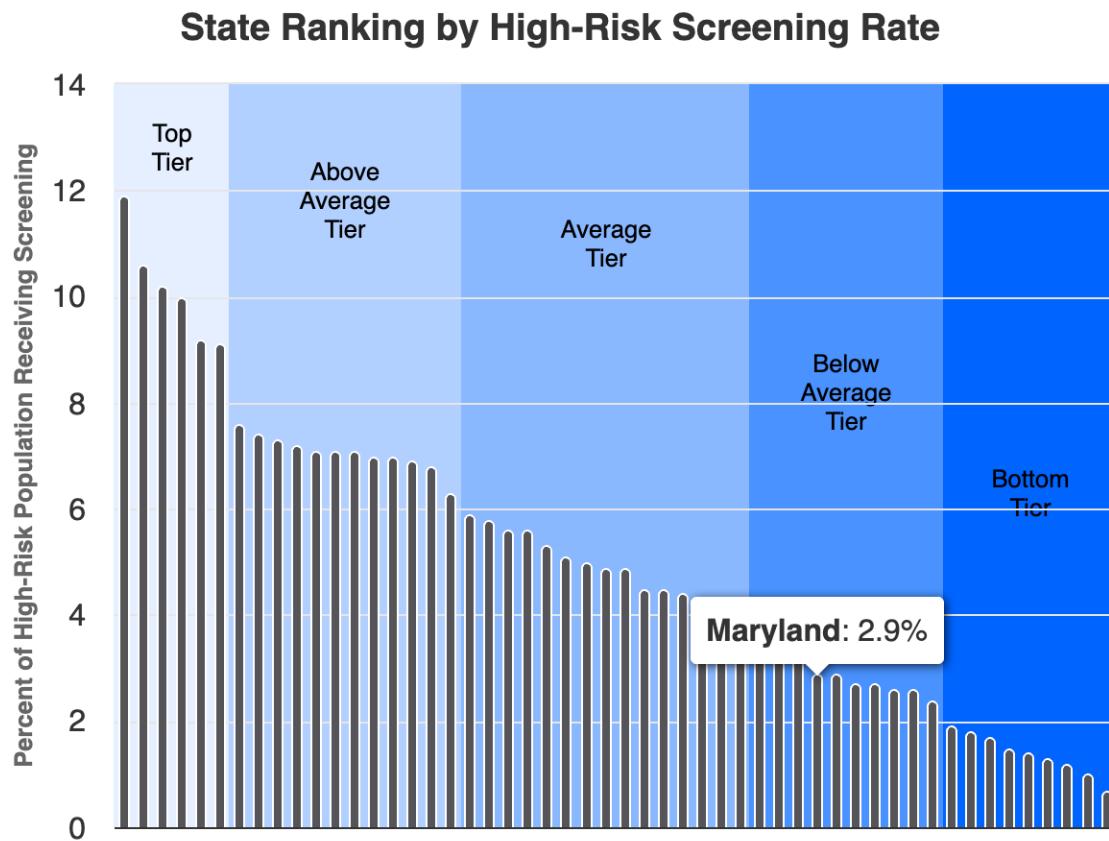


High proportion of cancer deaths not addressed by current cancer screening efforts in the US



- 39.9% of all cancer deaths attributable to cancer types covered by current USPSTF screening recommendations.
- 63.7% of US lung cancer cases meet current USPSTF smoking-based eligibility criteria for LDCT screening
- Proportion of cancer deaths addressed by screening recommendations decreased to 31.4%

Lung Cancer screening: State of Maryland in 2024



<https://www.lung.org/research/state-of-lung-cancer/states/maryland>

- 36,410 new cancer diagnoses
 - 4080 (11.2%) new cases of lung cancer
- 10,310 cancer related deaths
 - 2,010 (19.5%) deaths from lung cancer
 - Leading cause of cancer deaths
 - more than the next two most common, breast and colorectal cancer death combined

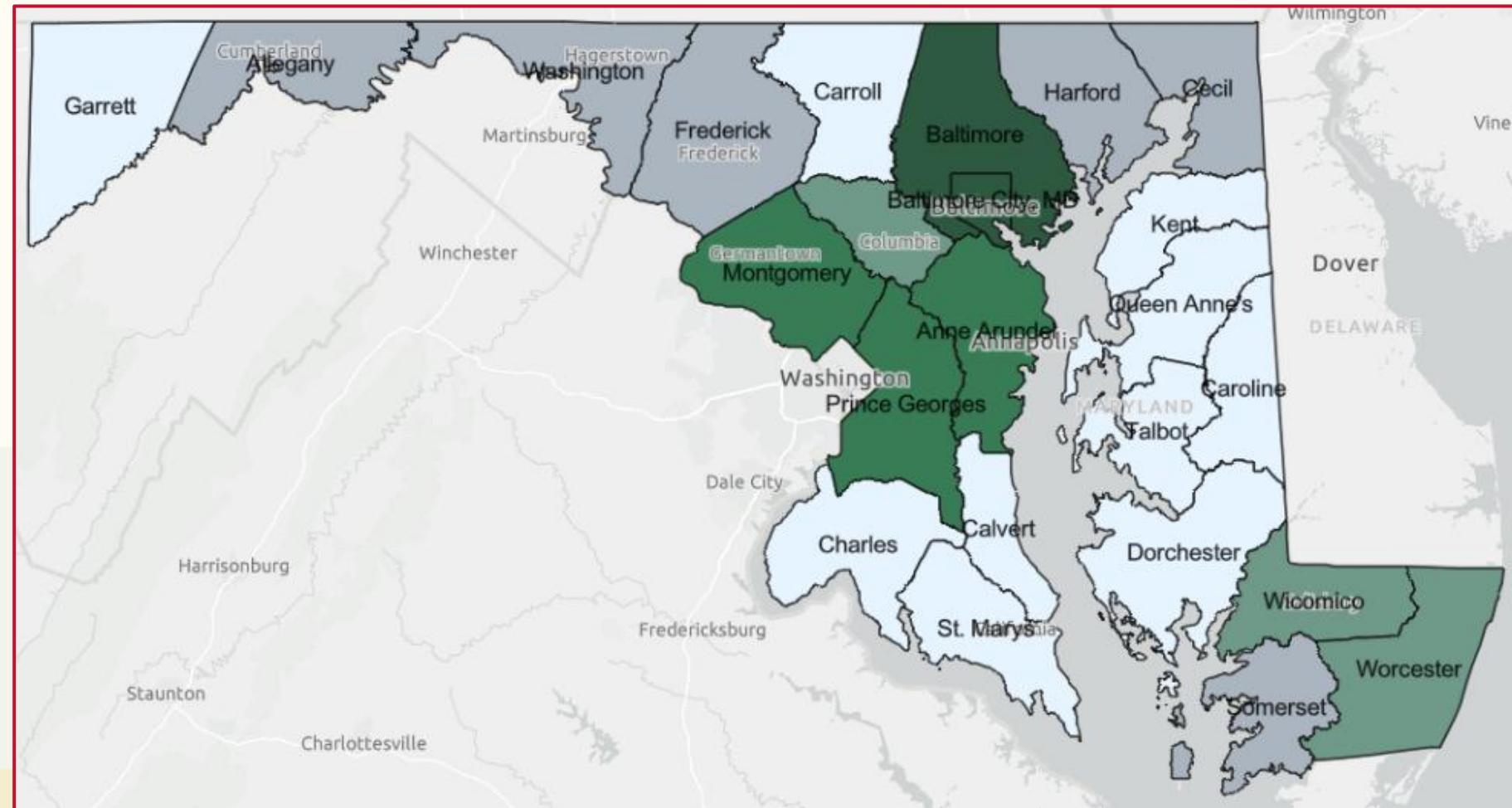
Maryland compared to national metrics in key attributes for lung cancer unmet needs

Descriptions	National Average	State Average
State		Maryland
State Rank		22
Total Annual Incidence Count		3,911
Average Incidence per 100,000	56.34	59.49
Total Annual Mortality Count		2,460
Average Mortality per 100,000	37.85	37.78
Average Mortality per Incidence count	0.55	0.63
Average Positivity Rate	4.02	5.46
Average Percent Current Smoking	24.78	21.40
Average Percent People Below Poverty	13.08	9.70
Average Percent People Age 65 over	18.79	17.27
Total High Risk Population		931,657
Total Population		6,018,848

Above National Average
± 10% National Average
Below National Average

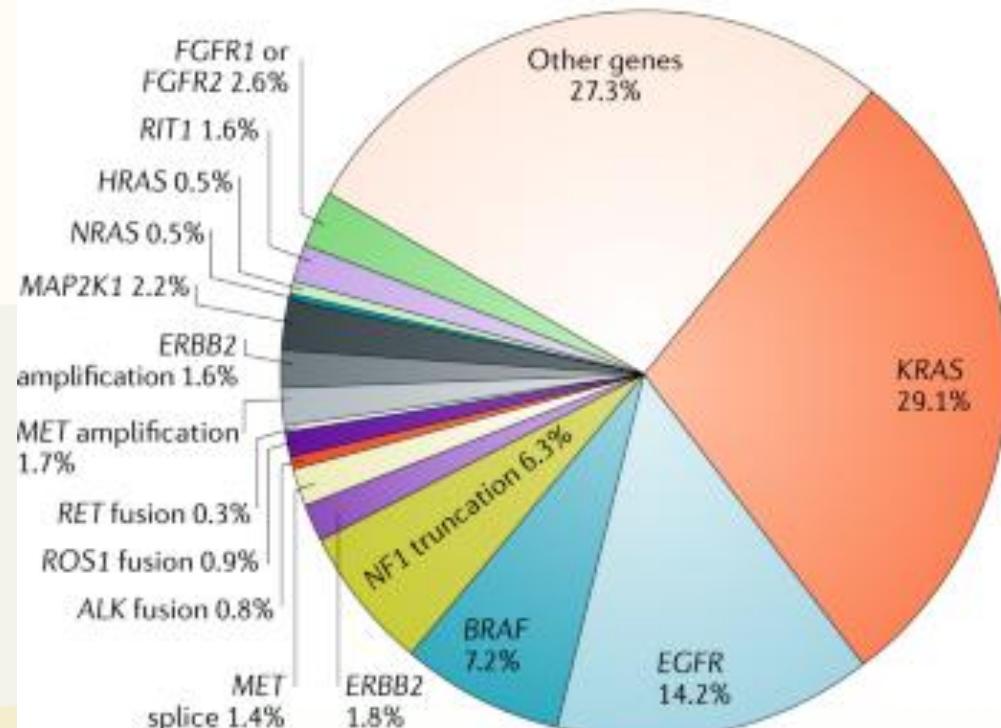
Ranking Group

- Top 100
- 101 - 200
- 201 - 400
- 401 - 1000
- All Others



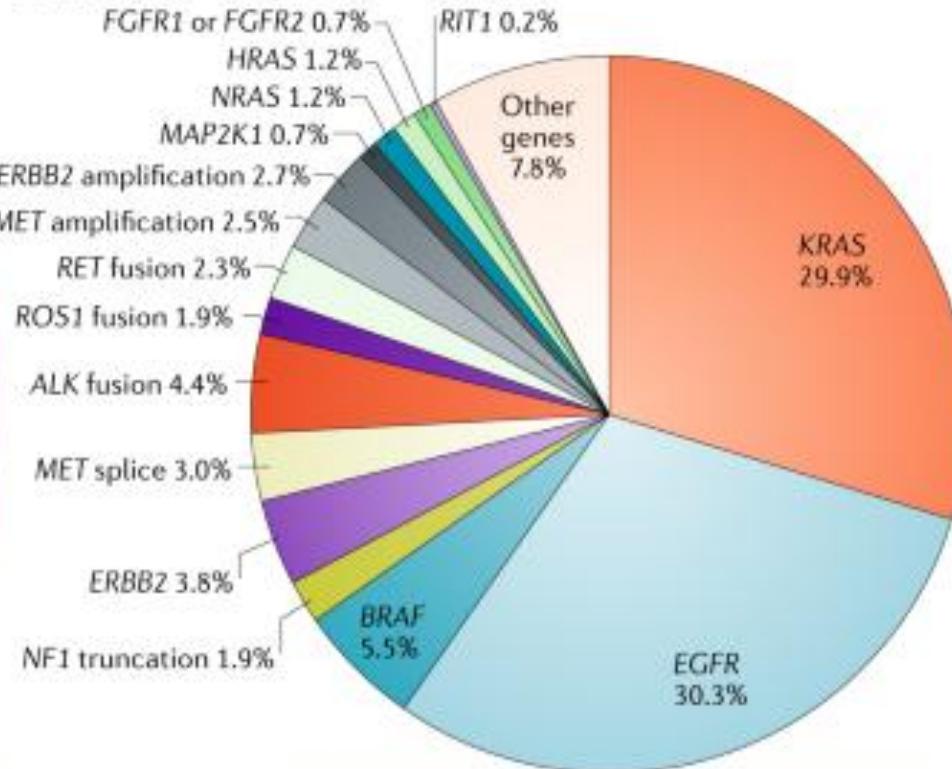
Molecular subtypes of lung cancer and novel therapies

a Early stage



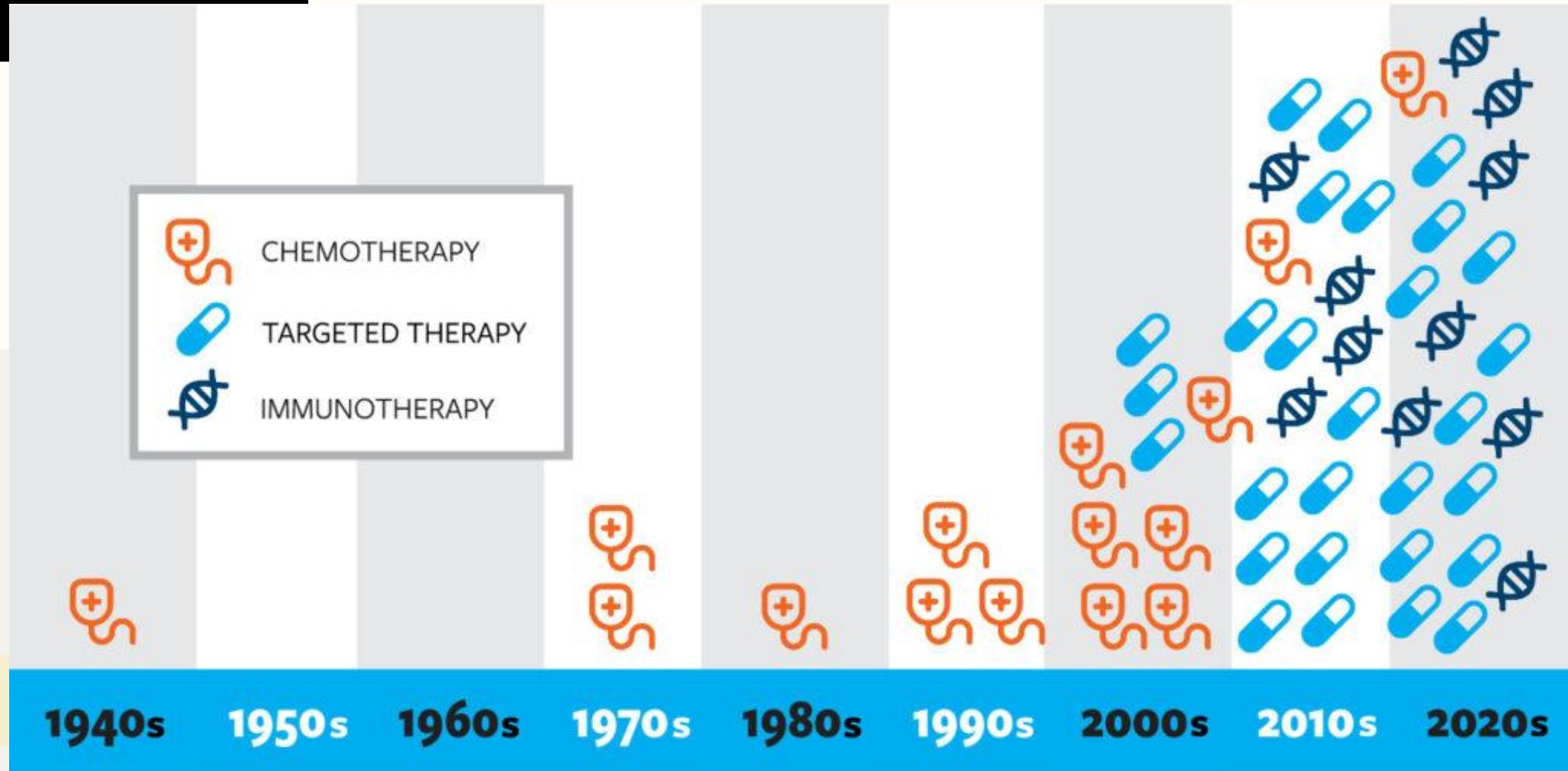
Data from TCGA (Sanchez-Vega et al.¹⁷⁸, Ellrott et al.¹⁷⁹ and Hoadley et al.¹⁸⁰), Imielinski et al.⁶² and Kadara et al.¹³³ (n = 741)

b Metastatic

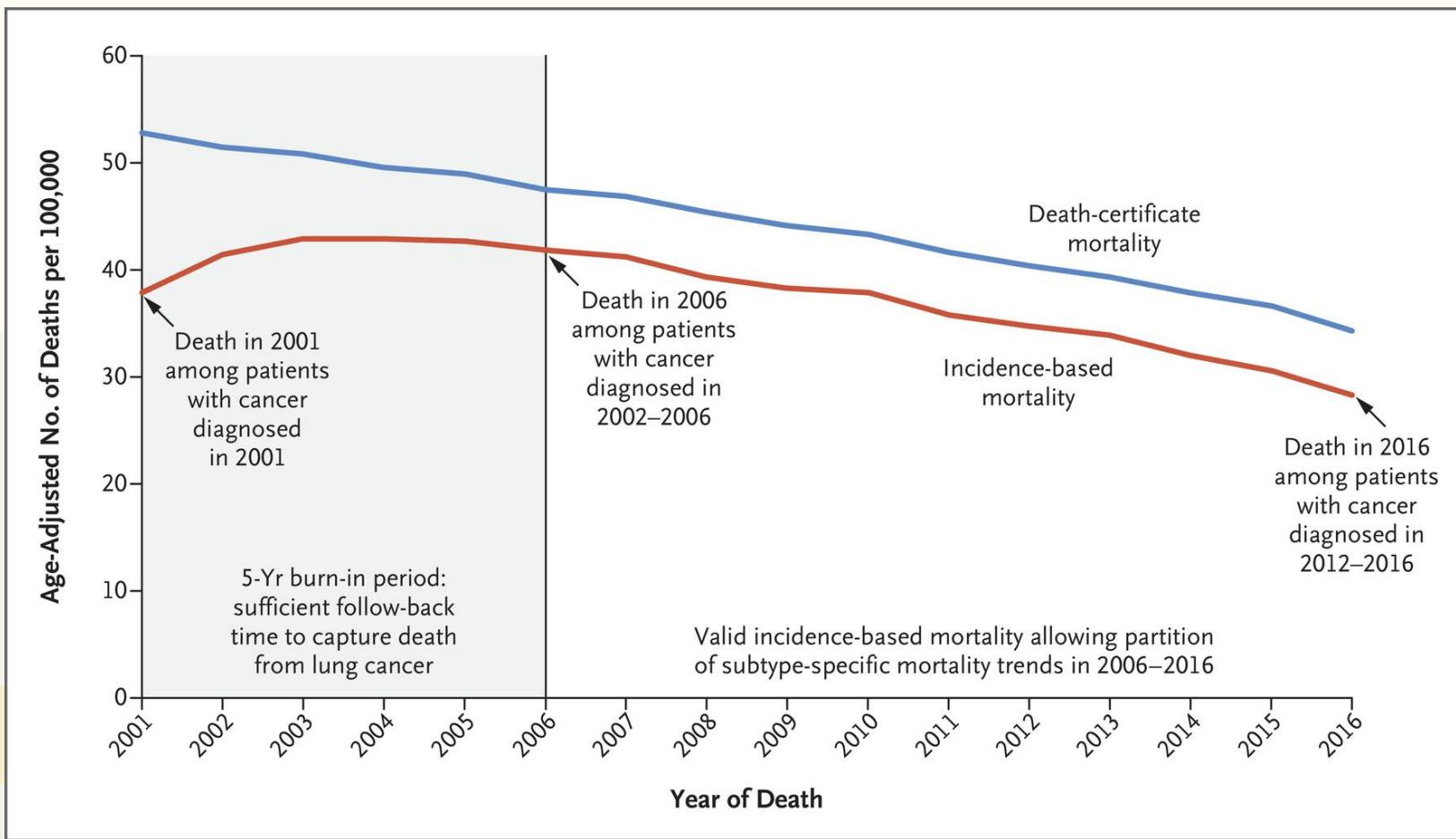


Data from MSK-IMPACT (Jordan et al.⁵³) and FoundationOne (Frampton et al.¹⁵) panels (n = 5262)

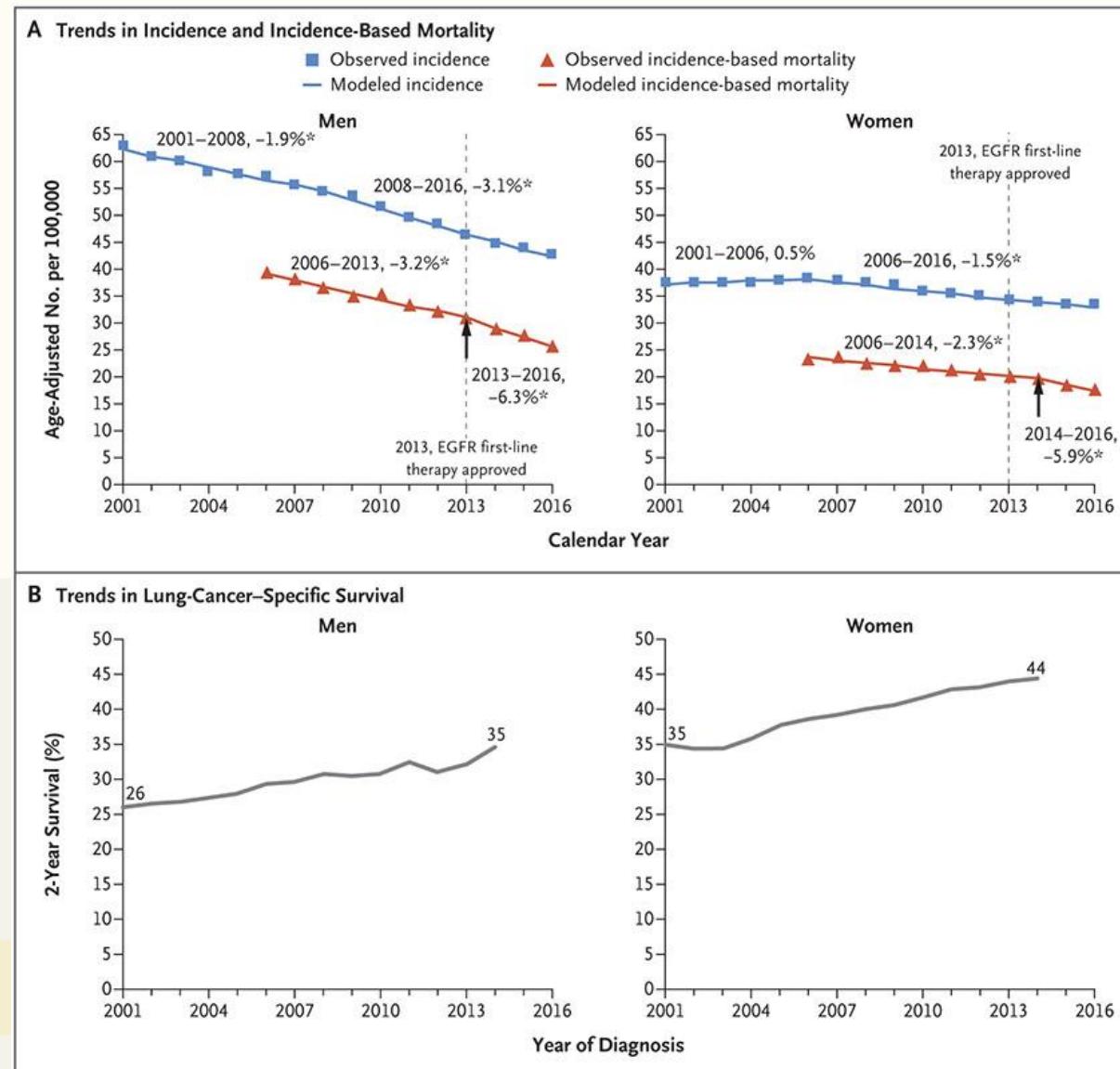
FDA approved drugs for lung cancer treatment



Improved survival for US lung cancer patients following introduction of targeted therapy



Improved survival for lung cancer with the use of EGFR targeted therapies

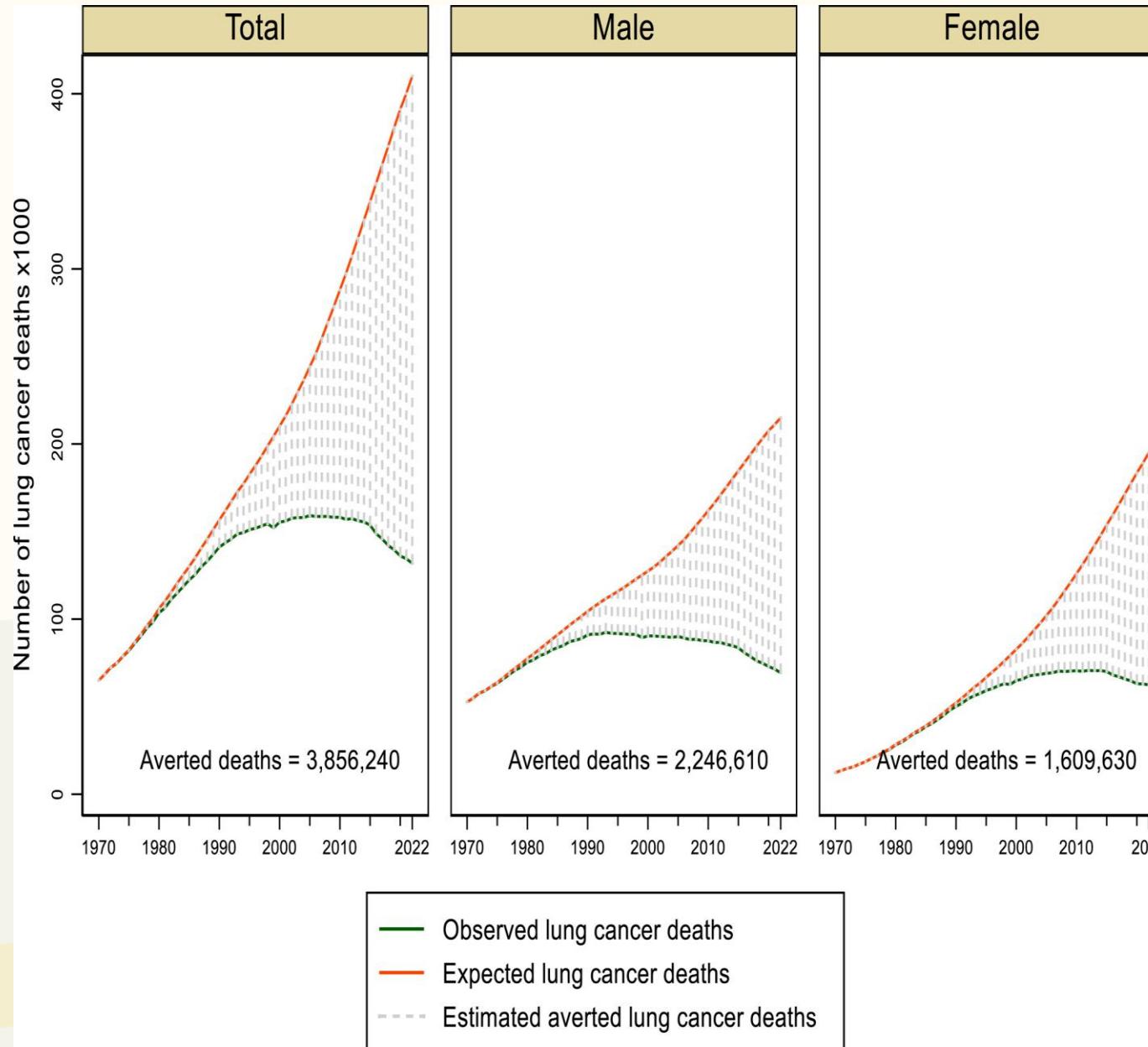


Howlader N et al. NEJM. 2020;383(7):640-9.

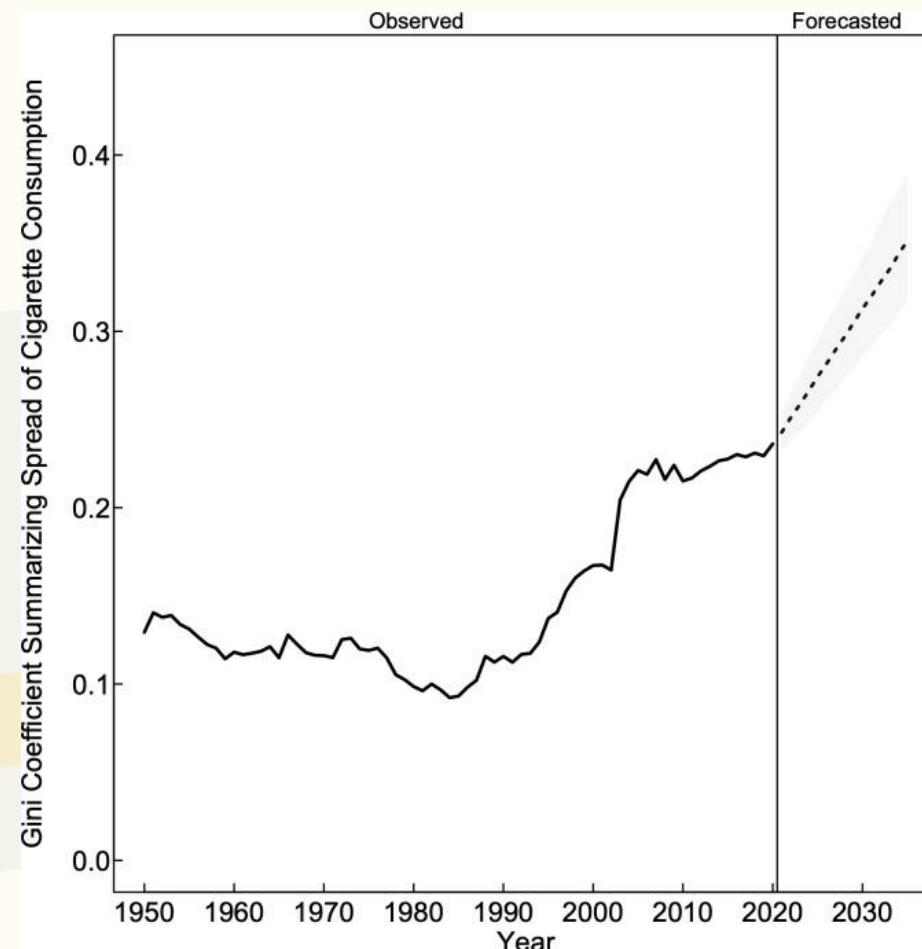
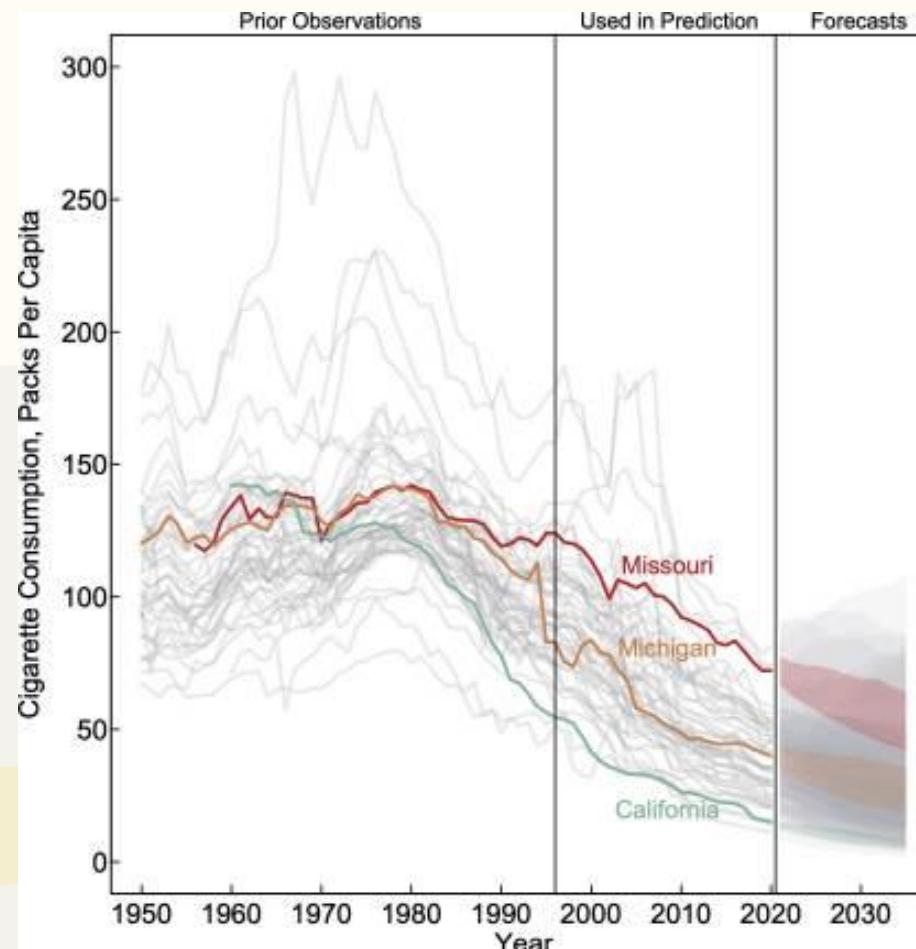
University of Maryland Greenebaum Comprehensive Cancer Center

Averted lung cancer deaths due to reduced cigarette smoking in the US 1970-2022

- Substantial reductions in smoking prevalence driven by tobacco control led to
 - >3.8 million lung cancer deaths averted
 - 76 million years of life gained in the United States during 1970-2022



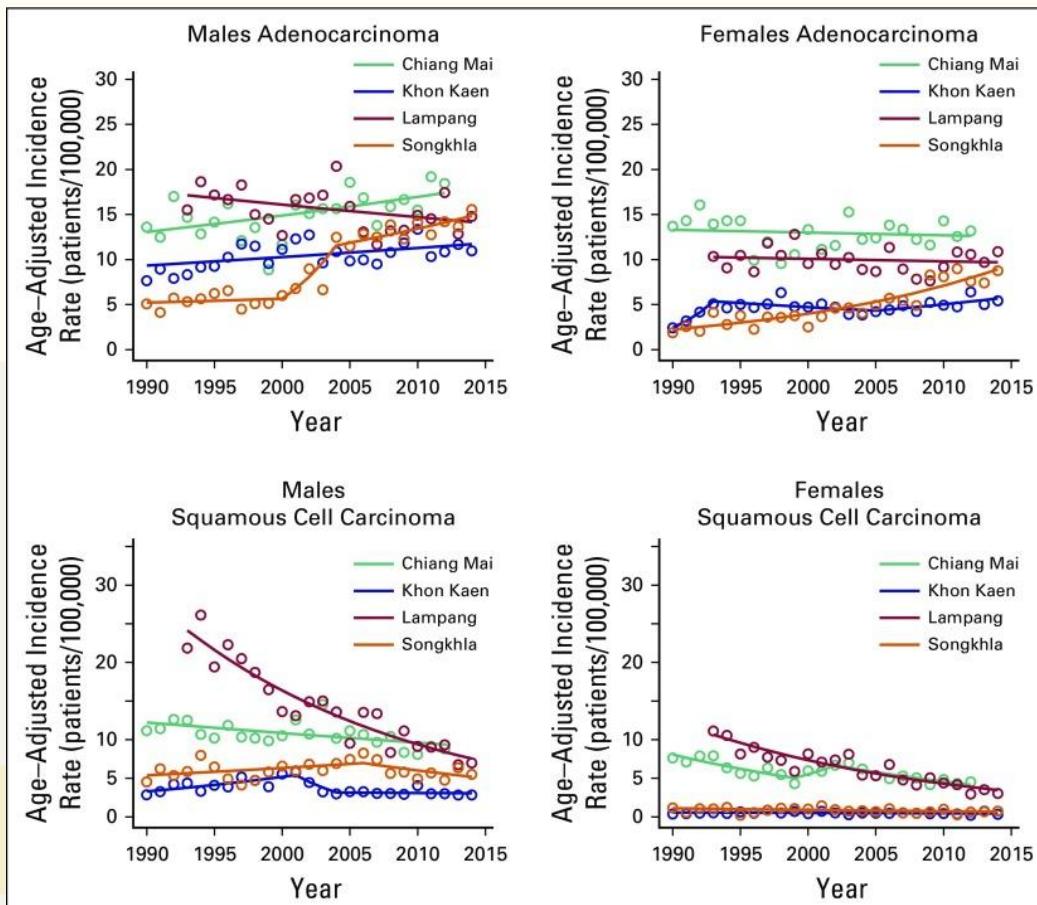
Trends in tobacco use and inequity in consumption in the US by states



Like filtered
cigarette, like
vaping!

Why do these stains mean so much to 1 out of every 3 smokers?

Like filtered
cigarette, like
vaping!



Chang JT et al. J Glob Oncol. 2018 Sep 7;4:JGO.18.00013

Status

Vaping & Cigarette Smoking

Cigarette Smoking

Nonsmoking

OR (95% CI)^{*}

57.8 (47.4–70.5)

13.9 (12.7–15.3)

1

Bittoni MA et al. Vaping, Smoking and Lung Cancer Risk. J Oncol Res Ther. 2024;9(3):10229



UMGCC & Astra Zeneca

Partnership in Cancer Screening

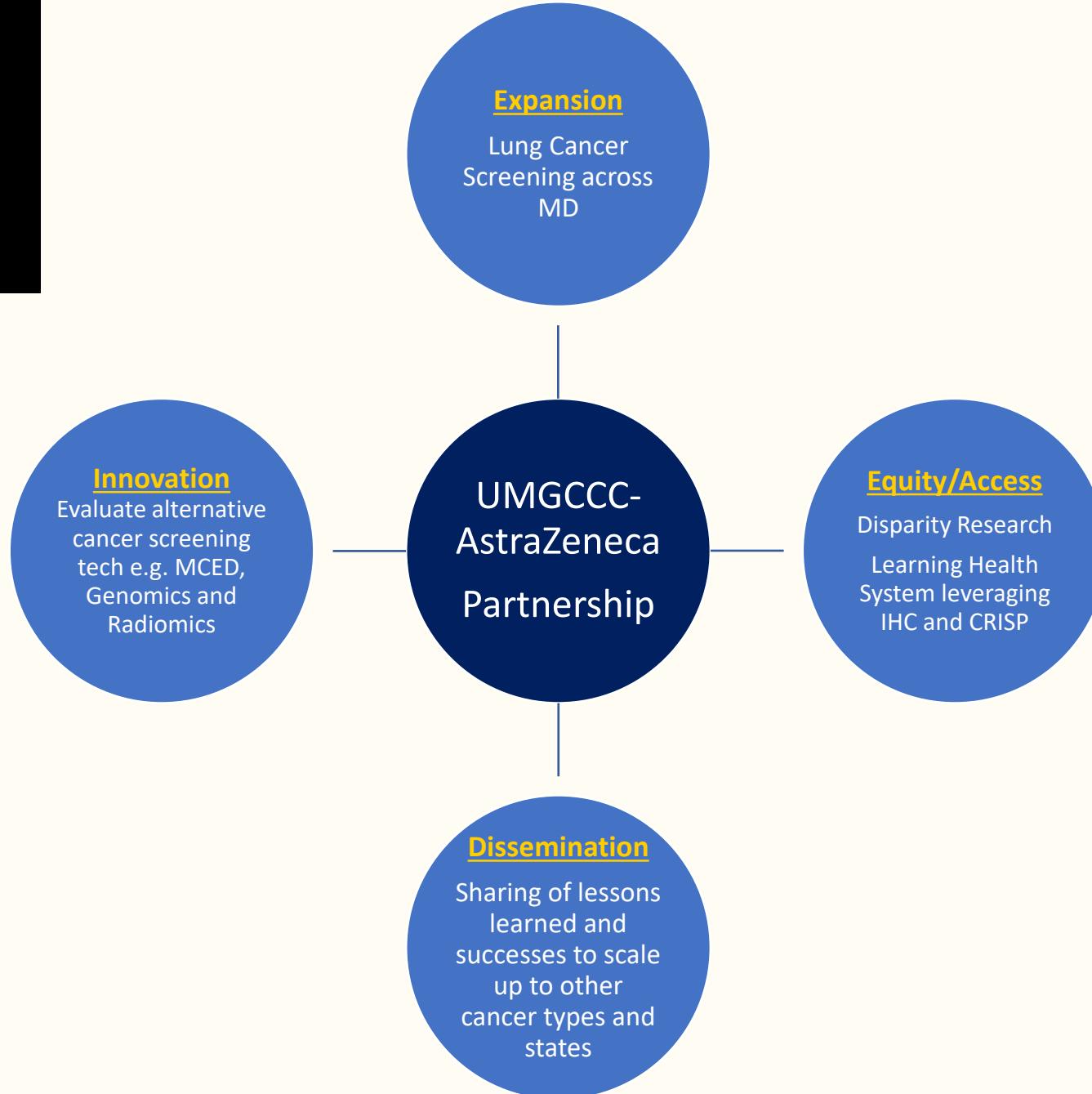
Our Mission

Undertake **innovative basic, clinical, population and prevention research** that will impact the understanding and treatment of cancer around the world and to **provide state-of-the-art clinical care to cancer patients in Maryland and beyond**

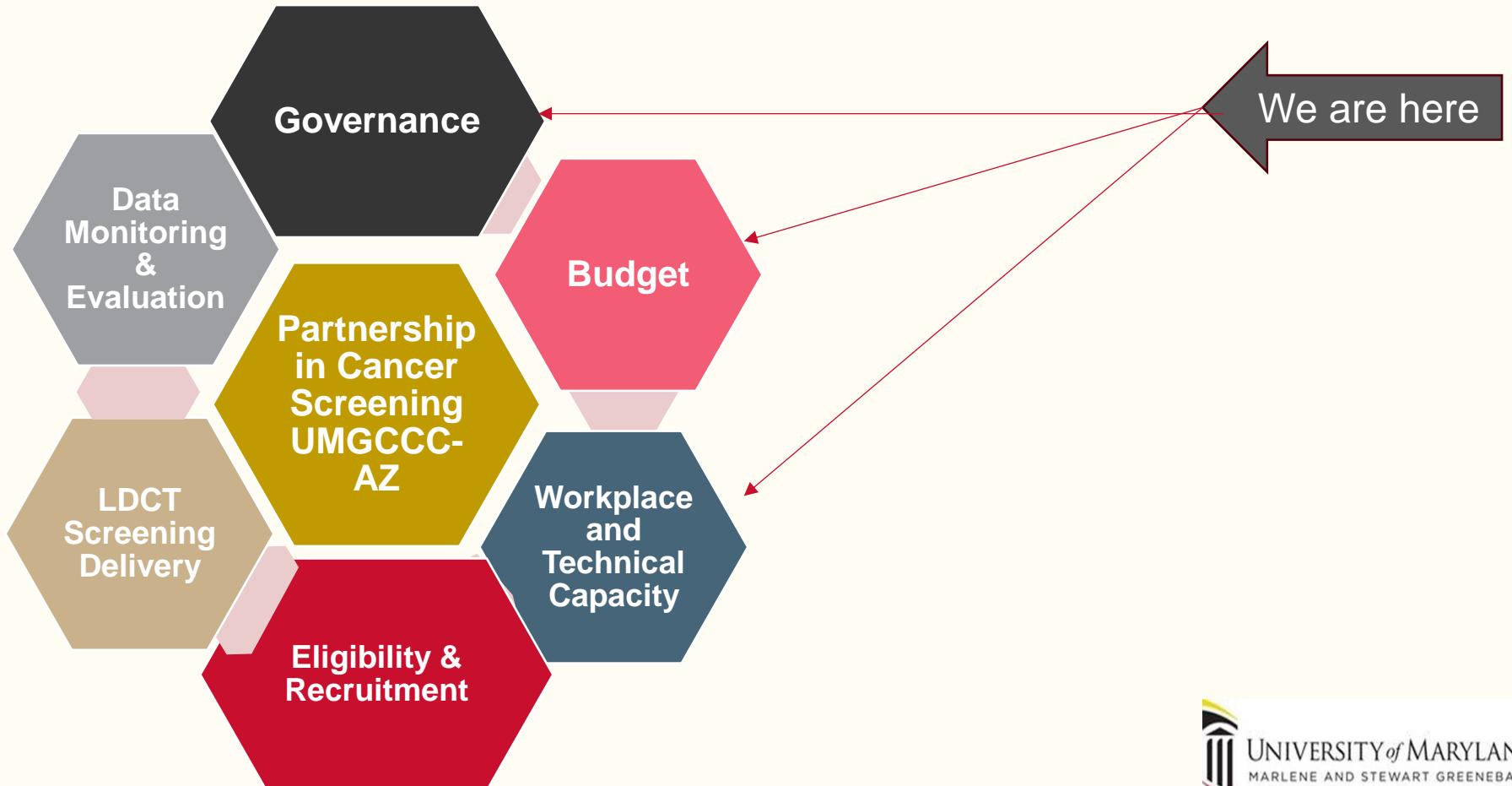


UNIVERSITY of MARYLAND
MARLENE AND STEWART GREENEBAUM
COMPREHENSIVE CANCER CENTER

Lung Cancer Early Detection Cancer Screening Initiative



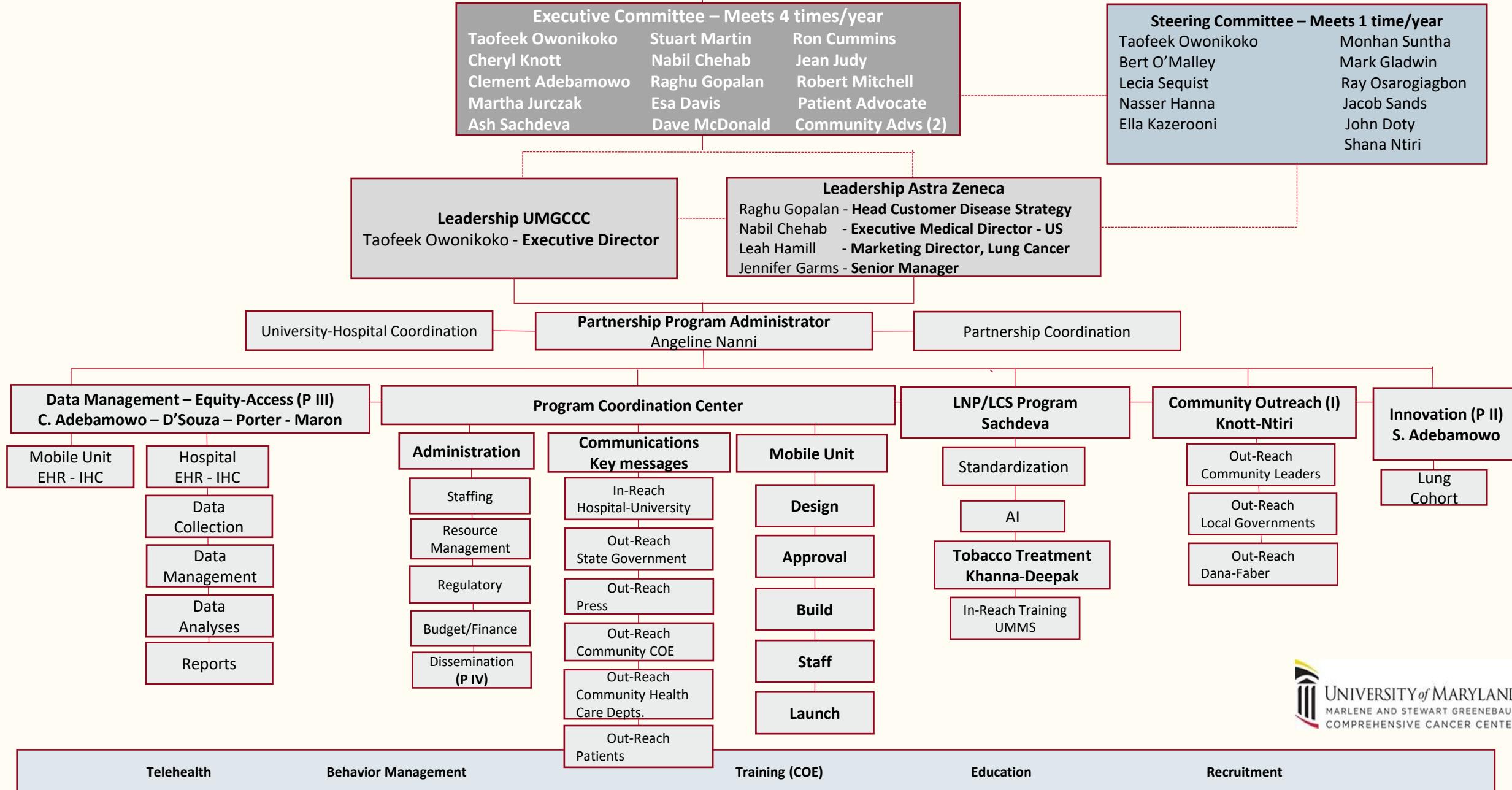
LCS Partnership Framework



Adapted from : Lung Cancer Policy Network. 2023. *A framework to support the implementation of LDCT lung cancer screening*. London: The Health Policy Partnership.

Organizational Chart

Partnership in Cancer Screening UMGCCC & Astra Zeneca



Characterizing Lung Cancer Patterns and Screening in Maryland

A

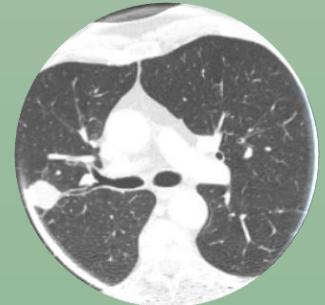
Researchers:

Clement Adebamowo
Warren D'Souza
Afsaneh Bahrami
Pratima Kshetry
Jay Rolla
Colleen Reilly





Lung Cancer Screening



Incidental Lung Nodule



Tobacco Treatment



Summary

- Tobacco use is a driver of major morbidities and mortality including lung cancer
- A significant decline in cigarette consumption has led to reduced incidence of lung cancer in the US especially in men; but tobacco smoke exposure remains the most important risk factor for lung cancer
- Tobacco use prevention efforts confer greater benefits at the population level than early detection of lung cancer or therapeutic strategies for advanced stage lung cancer
- Newer methods of inhaled carcinogens in the form of vaping and other delivery tools deserves great attention and systematic studies to avoid repeating the mistakes of the past



Questions and
comments?

Thank you!

