Why Screen for Lung Cancer – The Problem

- Leading cause of cancer deaths in US since:
  1955 for men
  1987 for women

- Leading cause of cancer deaths globally by 1980

- **1.8 MILLION** deaths/year worldwide

- By 2030, global lung cancer deaths ⬆ by **30%**

Why Screen for Lung Cancer – The Problem
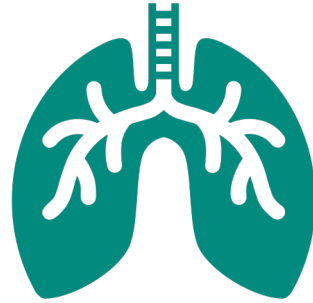
- The majority of patients are diagnosed with metastatic disease.

  - Curative systemic therapy is limited to a small proportion of patients.

  - Global access to curative systemic therapy is NOT available.

THE MOST EFFECTIVE APPROACH TO ADDRESS METASTATIC DISEASE IS TO PREVENT IT FROM OCCURRING IN THE FIRST PLACE!

Why Screen for Lung Cancer – The Evidence

NLST
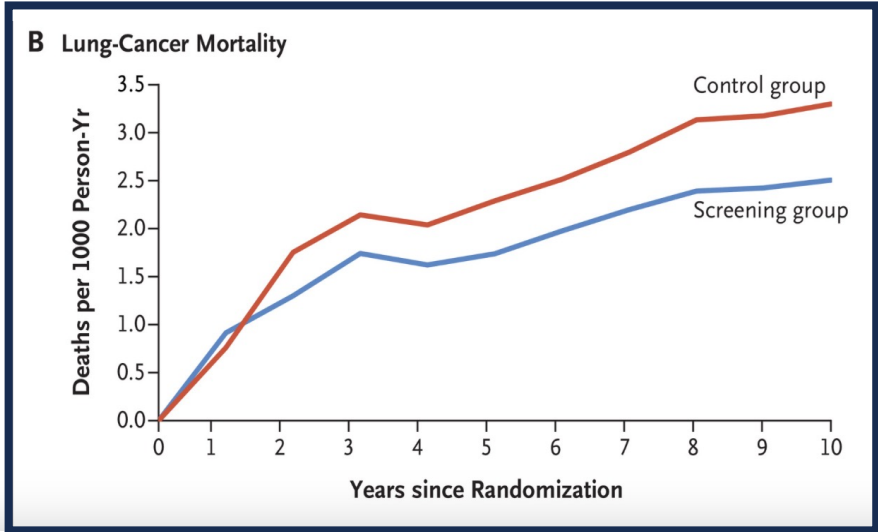
NELSON
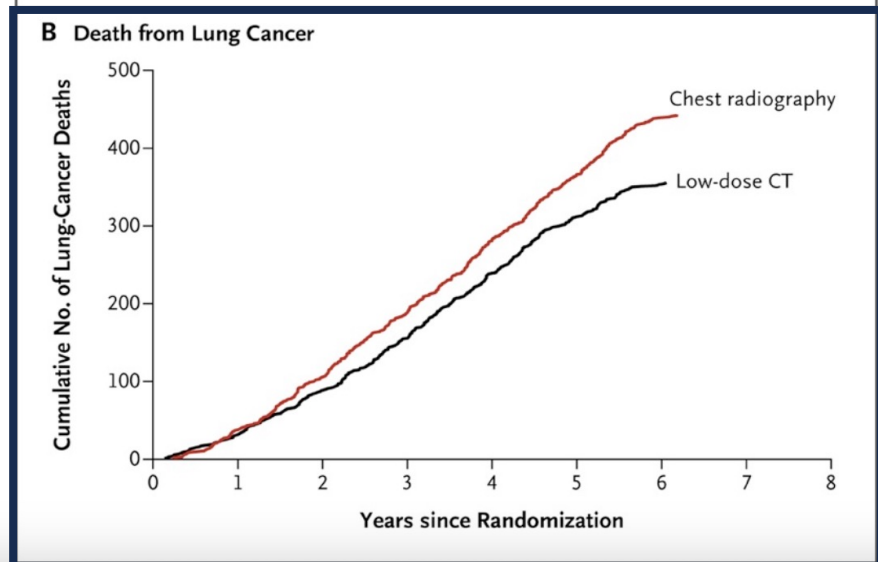
Cancer Statistics 2022
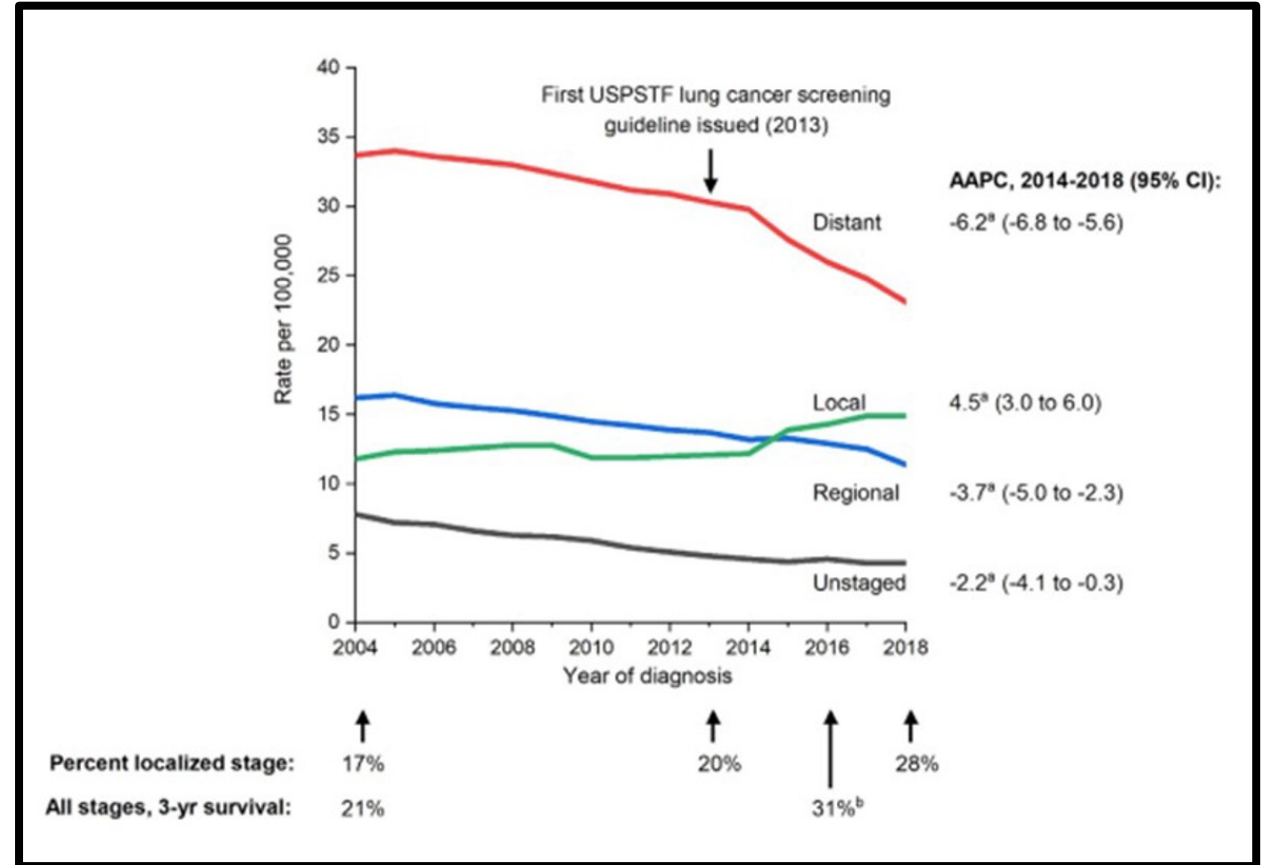
Aberele DK, et al. NEJM 2011
De Koning HJ, et al. NEJM 2020S
Siegel RL, et al. CA Cancer J Clinic 2022

Why Screen for Lung Cancer – The Evidence

Progression of Lung Cancer
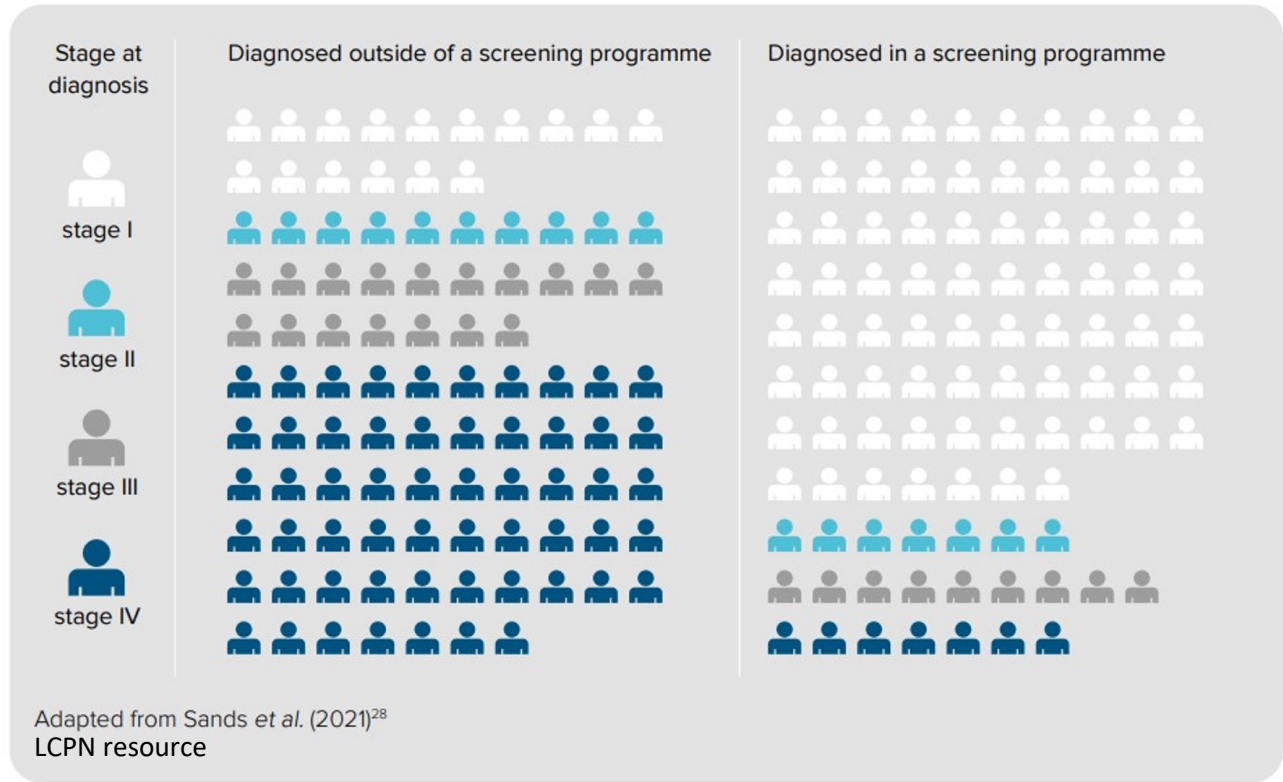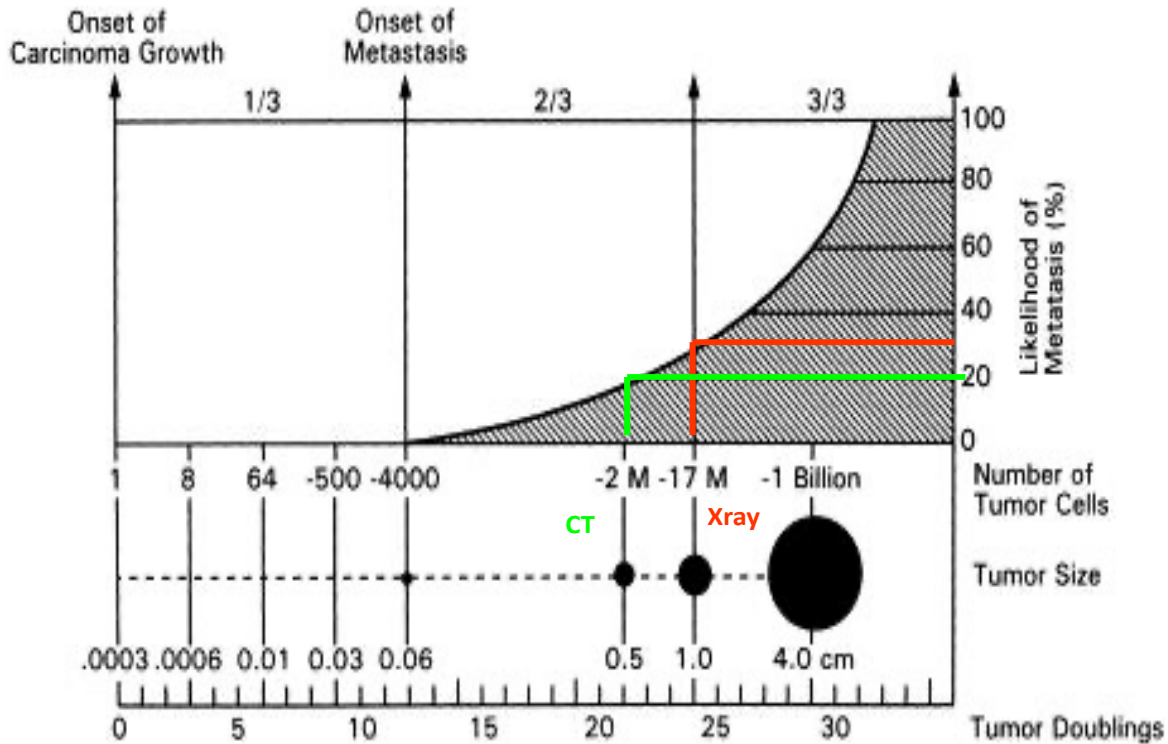
Mulshine JL et al: Clin Chest Med 23:37-48, 2002

State of Lung Cancer Screening - 2022

Nationally, only **5.8%** of those at high risk were screened.

Tiers

- Top (12.1%-16.3%)
- Above Average (7.8%-12.0%)
- Average (4.7%-7.7%)
- Below Average (2.9%-4.6%)
- Bottom (1.0%-2.8%)
- Data Not Available

CT
RI
DE
MD
DC
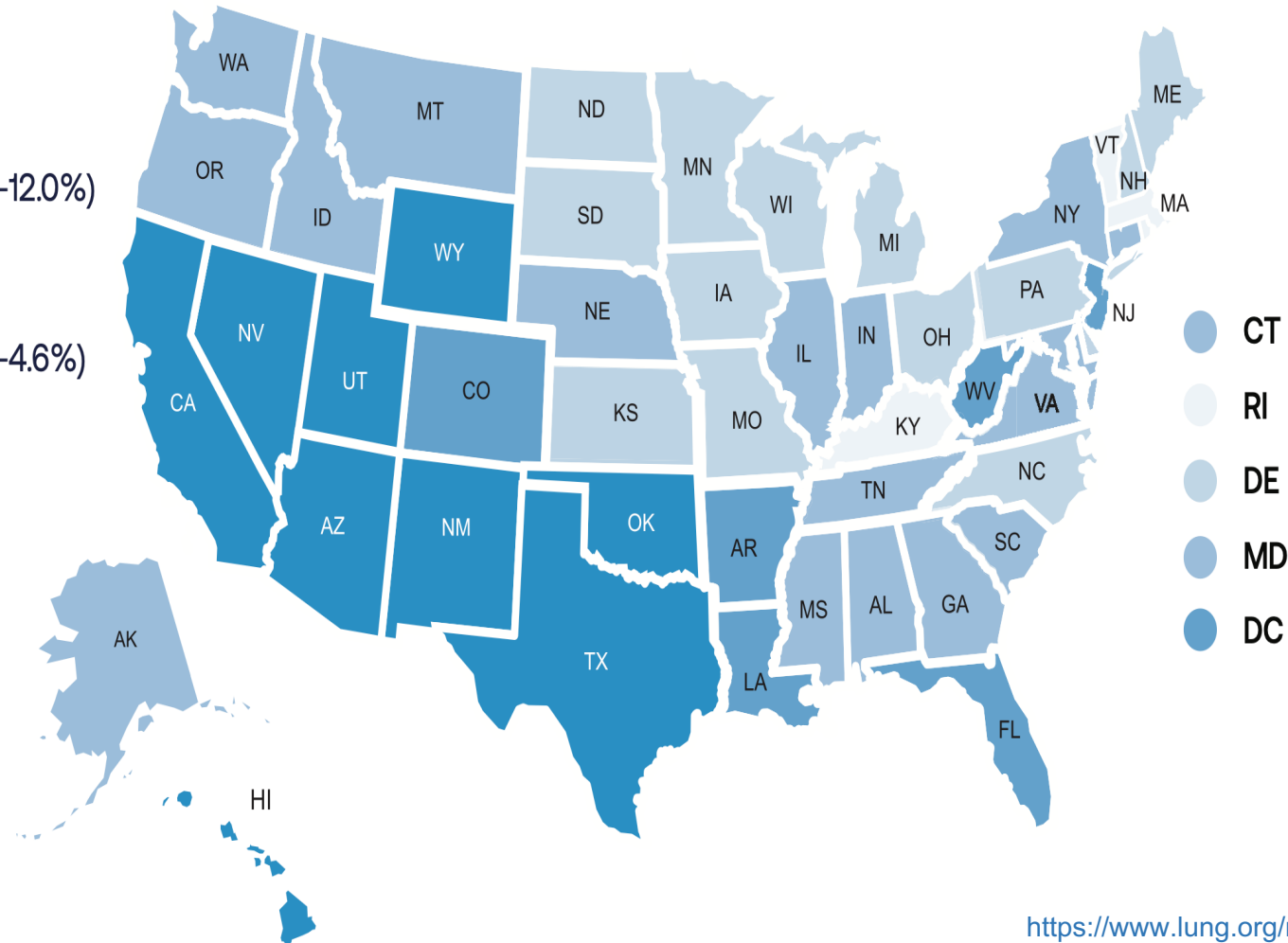
Low dose CT Screening USA 2023

LDCT Screening Implementation – First Steps

CALL TO ACTION

Together We Must Act to Increase Lung Screening to Save More Lives

On behalf of the millions of American families affected by lung cancer, we, the undersigned organizations, urge you to prioritize the early detection of lung cancer through public funding and health policies that increase access to and utilization of lung cancer screening among high-risk individuals.

Facts to consider

- In the United States, lung cancer accounts for 25% of all cancer-related deaths and claims more lives than breast, colorectal, and prostate cancers, combined.[1]
- Lung cancer is the leading cause of cancer-related death partially due to 46% of patients being diagnosed at an advanced state when curative treatment options are limited, and five-year survival rates are low.[2]
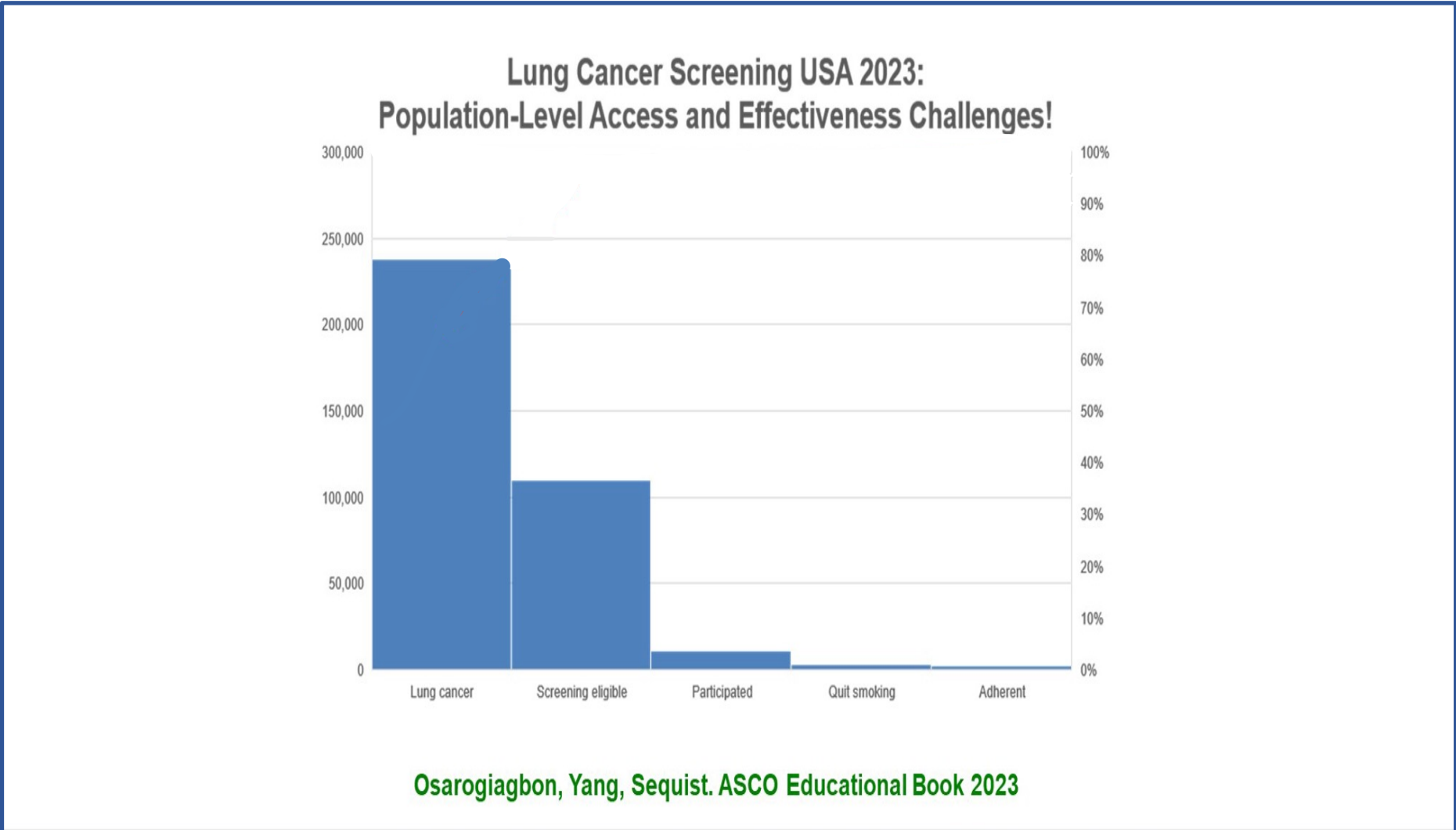
Early detection is key to reducing lung cancer mortality. The United States Preventive Services Task Force (USPSTF) first issued lung cancer screening recommendations in 2013, and last year expanded the criteria for lung cancer screening eligibility in their recommendation statement. The eligible high-risk group is now defined as individuals 50-80 years old who currently smoke, or formerly smoked, with a 20 pack-year or greater smoking history, and who have smoked within the last 15 years.[3]

To reduce lung cancer mortality nationwide, the United States must increase the use of lung cancer screening by the people considered high-risk. Unfortunately, the evidence indicates that only 5.7% of Americans considered high-risk for developing lung cancer had a recent low-dose computed tomography (LDCT) screening exam for lung cancer.[4] Comparatively, self-reported screening rates for breast, cervical and colon cancers have an overall 67%-76% participation rate among guideline-based eligible populations.[5] For the nation to fully confer the benefits of screening, it must seek concerted and innovative strategies to reach those at high-risk for developing lung cancer. Access to lung cancer screening has improved over the past decade due to insurance coverage requirements in the Affordable Care Act and expansion of eligibility criteria under the USPSTF 2021 recommendation.[6]

However, several barriers significantly inhibit participation. These include, but are not limited to, discrepancies in state Medicaid coverage for lung cancer screening, challenges with identifying, enrolling, and navigating patients through lung cancer screening, awareness gaps at the provider, patient, and community levels, and deficiencies in quality incentives at the health system level.

MOFFITT CANCER CENTER

ROSWELL PARK COMPREHENSIVE CANCER CENTER

LUNGEVITY Find it. Treat it. Live.

IASLC INTERNATIONAL ASSOCIATION FOR THE STUDY OF LUNG CANCER Conquering Thoracic Cancers Worldwide

GO2 FOUNDATION FOR LUNG CANCER

AACI Association of American Cancer Institutes

American Cancer Society

NATIONAL LUNG CANCER ROUNDTABLE

American Lung Association

Mass General Brigham **Mass General Cancer Center**

1 Accelerate Awareness
- Implement a Comprehensive National Education Campaign
- Leverage Tobacco Prevention and Cessation Resources to Encourage Lung Cancer Screening

2 Improve Access to Lung Cancer Screening
- Expand Access to Quality Healthcare to Ensure More Individuals At High-Risk for Lung Cancer Have Access to Screening and Treatment
- Requirement Medicaid Coverage for Guideline-Based Lung Cancer Screening & Address Challenges Associated with Prior Authorization and Physician Ordering
- Incentivize Approaches for Equitable Access to Lung Cancer Screening

3 Regulate Quality
- Prioritize Quality Measures to Increase Uptake of Lung Cancer Screening Among Eligible Individuals. (HEDIS measure coming in 2024)
- Invest in Comprehensive Lung Cancer Screening Sites

Health System Barriers to Screening

Lack of a Workforce

- Too much work for providers
  - Complex eligibility
  - Shared decision making
  - Smoking cessation counseling
- Lack of Follow up and Treatment Infrastructure
- Too much work for Radiologist

Stigma/Nihilism

- Prevents people from seeking medical assistance.
- Common assumption that nothing can be done by patients and providers.

Lack of Technical Capacity

- CT scanners
- Nodule detection software
- Increased EMR requirements

Lack of Financial Resources

Lack of Financial Resources

- The economic burden of lung cancer far exceeds that of other cancers in the US and worldwide. *(Chen S, et al. JAMA Oncology Feb 2023)*

- Low dose CT screening is cost effective
  - NSLT analysis *(Black WC, et al. NEJM 2014)*
  - USPSTF 2021 *(Toumazis I, et al. JAMA Onc 2021)*

Components of Building a Screening Program
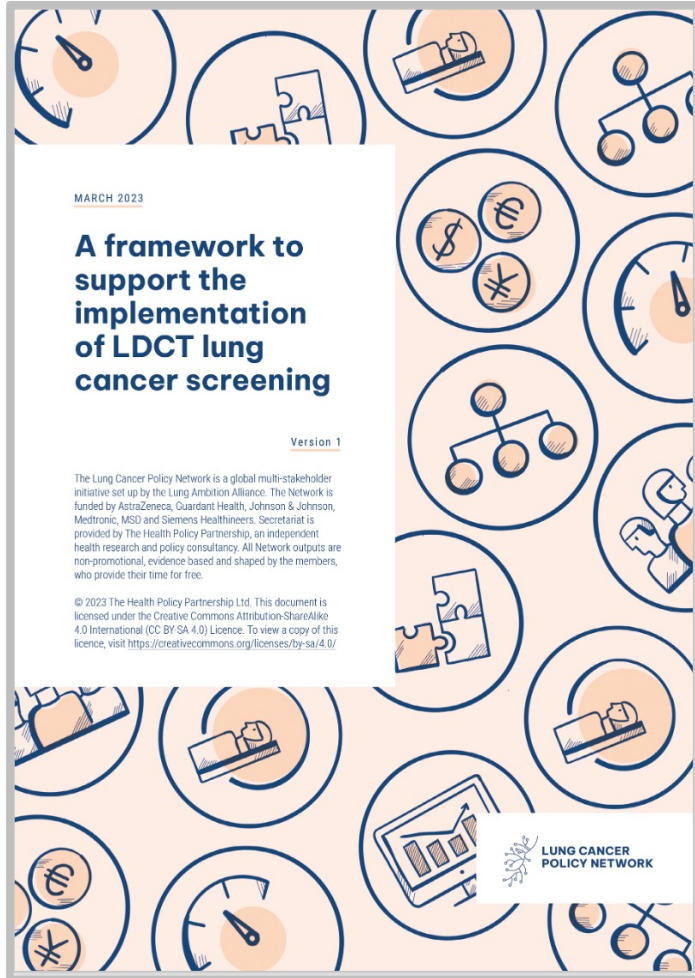
Figure 1. Six domains for assessing health system readiness for the implementation of lung cancer screening

DOMAIN 1	DOMAIN 2	DOMAIN 3	DOMAIN 4	DOMAIN 5	DOMAIN 6
Governance	Workforce and technical capacity	Financial planning	Eligibility and recruitment	LDCT screening delivery	Data monitoring and evaluation

https://www.lungcancerpolicynetwork.com
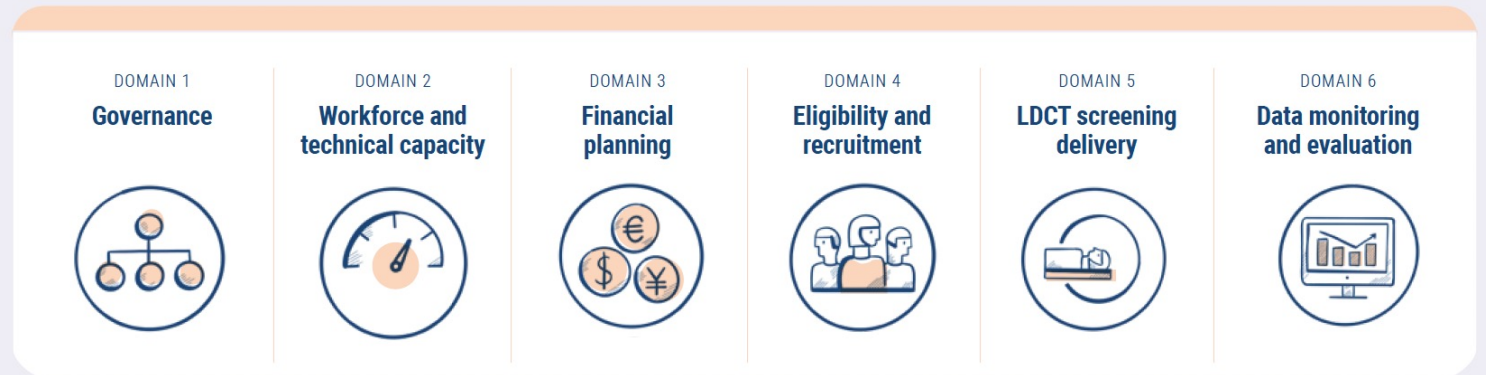
Components of Building a Screening Program

DOMAIN 1

Governance

Engage the entire healthcare community and other relevant stakeholders to advocate for screening

- Create a multidisciplinary group to build consensus on the adoption and implementation of lung cancer screening among stakeholders and make the case with governments

Establish clear leadership and accountability

- Ensure governance processes are embedded across all aspects of the programme
- Establish operational responsibilities and coordination of the programme from the outset

Involve communities targeted by screening in programme governance

- From the beginning, consult with and engage groups and communities who may face complex barriers to participation and involve them in the governance of the screening programme

- Patient advocates/organisations
- Lung cancer/cancer research institutes or non-governmental organisations
- Specialist clinical institutions offering medical imaging or cancer care (e.g. hospitals)
- Community-based healthcare professionals (e.g. pharmacists)
- Family physicians (general practitioners)
- Occupational physicians
- Primary care nurses
- Respiratory medicine specialists (pulmonologists)
- Smoking cessation specialists or clinics
- Radiologists
- Radiographers
- Medical physicists
- Thoracic surgeons
- Medical oncologists
- Radiation oncologists
- Specialist nurses (in cancer or respiratory health)
- Medical and pathology lab scientists
- Public health specialists/epidemiologists
- Non-clinical support staff (e.g. programme coordinators, project managers, administrators)
- Patient navigators
- Industry (e.g. medical imaging or pharmaceutical companies)

https://www.lungcancerpolicynetwork.com

Components of Building a Screening Program

DOMAIN 2

Workforce and technical capacity

Evaluate workforce and technical capacity requirements for lung cancer screening

- Identify staff shortages and technical capacity limitations to determine whether additional health system workforce, training and/or resource redistribution are required

- Ensure that the wider workforce requirements for proper follow-up and treatment post-screening are clearly understood to mitigate any bottlenecks

Tailor the model of lung cancer screening to the needs and parameters of each health system

- Identify the organisational model that offers appropriate coverage, promotes consistency in quality and uses existing resources efficiently

- Explore and assess the feasibility of capacity development activities where needed to improve the distribution of resources for lung cancer screening implementation

Strengthen the entire lung cancer care pathway

- Ensure that everyone with a positive result from screening receives prompt diagnosis, treatment and onward care led by a multidisciplinary team

- Invest in improvements across the lung cancer pathway to address gaps where needed

Model	Key aspects of the model[11] [14-16]
Centralised	> Primary care professionals actively recruit eligible participants and refer them to the programme > The lung cancer screening programme team then reviews all scans, arranges consultations and follow-ups, tracks all clinical and outcome data, and communicates results and treatment plans to the participant and primary care professional > Centralised programmes require significant resources, including a dedicated programme coordinator, clinical leadership and a multidisciplinary team
Decentralised	> The lung cancer screening programme team acts as a collaborative partner to the primary care professional who actively recruits eligible people > Both the primary care professional and lung cancer screening programzme team review the scans. They then decide between them who will arrange consultations and follow-ups, including communicating results and treatment plans to the participants
Hybrid	> Hybrid programmes fall in between fully centralised and decentralised lung cancer screening programmes > All aspects of participant management throughout the screening process may be shared by the primary care professional and the programme team > Although centralised screening units are used, screening may also be offered in decentralised units (e.g. mobile vans) to achieve greater population coverage

https://www.lungcancerpolicynetwork.com

Components of Building a Screening Program

DOMAIN 3

Financial planning

Plan for the funding and coverage of all programme costs

- Integrate every aspect of the screening pathway into financial planning.
- Ensure the long-term financial sustainability of the screening programme.

Mitigate financial barriers to participation, providing funding to support targeted outreach

- Develop strategies to mitigate or remove individual participant costs to help address inequities in access to screening.
- Ensure that funding is available to conduct targeted outreach.

Collect the right data to model the financial impact of programme design

- Map how programme costs may change over time, such as through expanded eligibility criteria.
- Incorporate locally relevant data on costs into any forecasting models.

https://www.lungcancerpolicynetwork.com

Components of Building a Screening Program

DOMAIN 4

Eligibility and recruitment

Establish how the eligible population for screening will be assessed

- Integrate the best available local data and consider the most appropriate risk models according to the population demographics to reduce the risk of exacerbating disparities.

Engage healthcare professionals with the screening programme

- Establish clear roles for how healthcare professionals will be involved in the recruitment of the eligible population and consider using patient navigators to foster equitable delivery.

- Support healthcare professionals through appropriate training and consider the use of incentives.

Co-design screening programmes with high-risk communities

- Co-design recruitment strategies with communities less engaged with the health service.

- Tailor participant information to communities at risk of lower screening uptake, responding appropriately to expressed informational needs.

Components of Building a Screening Program

DOMAIN 5

LDCT screening delivery

Develop protocols that are tailored to the target population and can adapt to emerging evidence and innovation

- Anticipate the need for implementation research to refine protocols and account for variability in target populations
- Regularly review guidelines to ensure protocols are up to date with the latest evidence
- Consider the adoption of emerging techniques to improve the ability of screening programmes to detect lung cancer.

Ensure high-quality screening from start to finish

- Strive for a comprehensive approach to quality assurance across the entire screening programme for lung cancer
- Support the development of processes to enhance the quality of screening, such as benchmarking and accreditation
- Enable continuing professional development of healthcare professionals in standards for quality assurance

Embed smoking cessation services within screening programmes

- Promote the delivery of multiple types of smoking cessation interventions into screening programmes to maximise their effectiveness
- Consider the optimal approach to engaging the target population for screening in smoking cessation services

https://www.lungcancerpolicynetwork.com

Components of Building a Screening Program

DOMAIN 6

Data monitoring and evaluation

Types of data	Implementation outcomes	Service outcomes*	Participant outcomes	Population outcomes
Examples	Acceptability	Effectiveness	Participation rate	Stage distribution
	Adoption (and uptake)	Efficiency	Stage distribution	Survival rate
	Appropriateness	Equity	Mortality rate	Demand for treatment
	Cost-effectiveness	Person-centredness		Quality of life
	Feasibility	Safety		
	Fidelity (adherence to protocol)	Timeliness		
	Sustainability			
Types of evaluation	Process evaluation (monitoring), operations research		Outcome evaluation	Impact evaluation

Establish what data are important to capture

› Identify what data are required for each component of a screening programme to be fulfilled

› Establish data-sharing agreements and digital infrastructure to promote better access to the data needed for effective implementation

Ensure that data collected and systems used for screening are compatible

› Build in checks on the quality of data collected to ensure consistency throughout the screening programme

› Promote communication between different systems and providers to facilitate seamless data exchange

› Enable opportunities to leverage data management systems to guide clinical decision-making and optimise the efficiency of screening
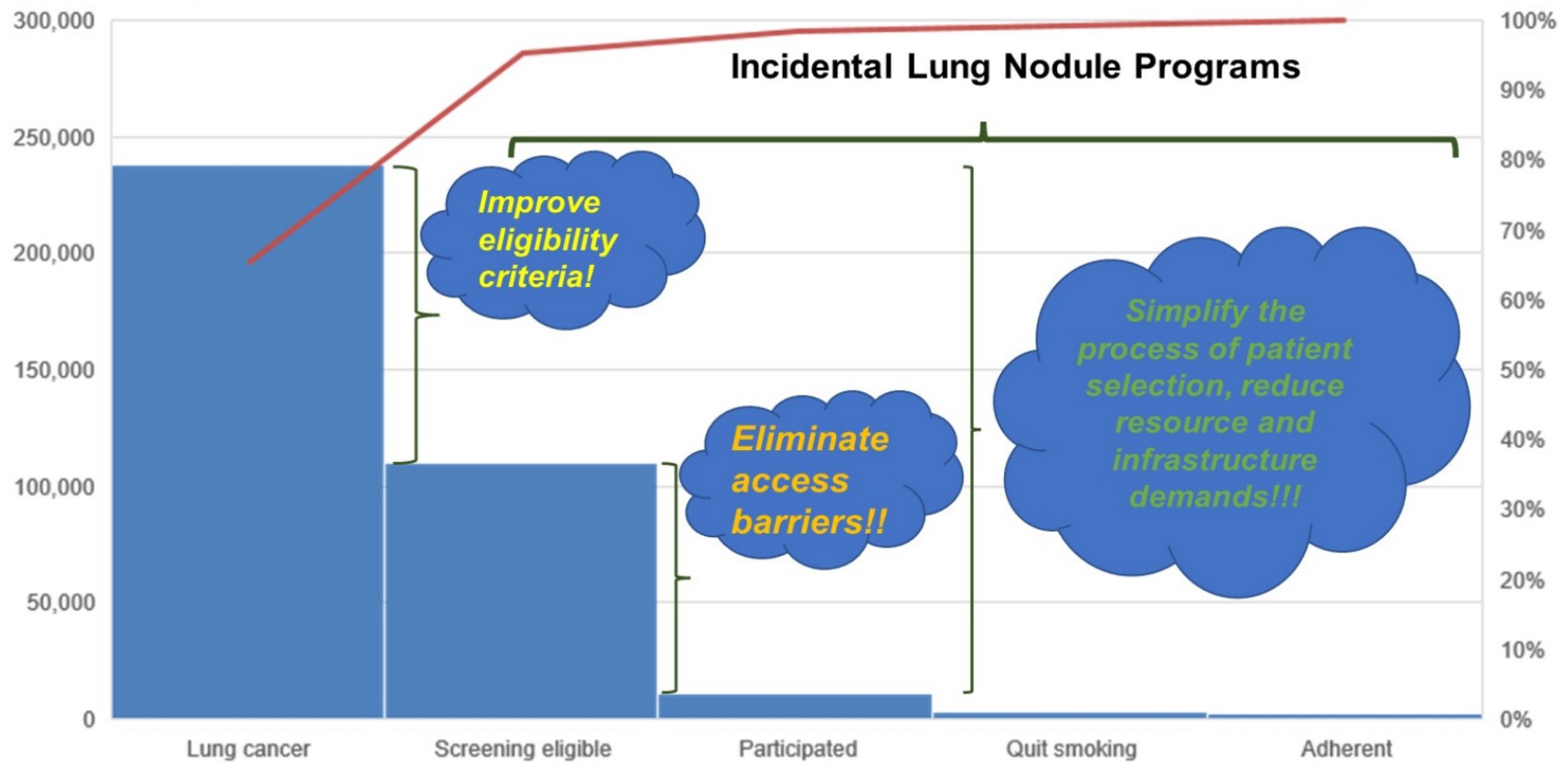
Plan how the screening programme will be evaluated

› Establish benchmarks for monitoring and evaluating the performance of a screening programme

› Adhere to best practice when setting up, maintaining and reporting findings from a cancer screening registry

› Encourage the active participation of all relevant stakeholders in evaluation processes to derive comprehensive and meaningful insights
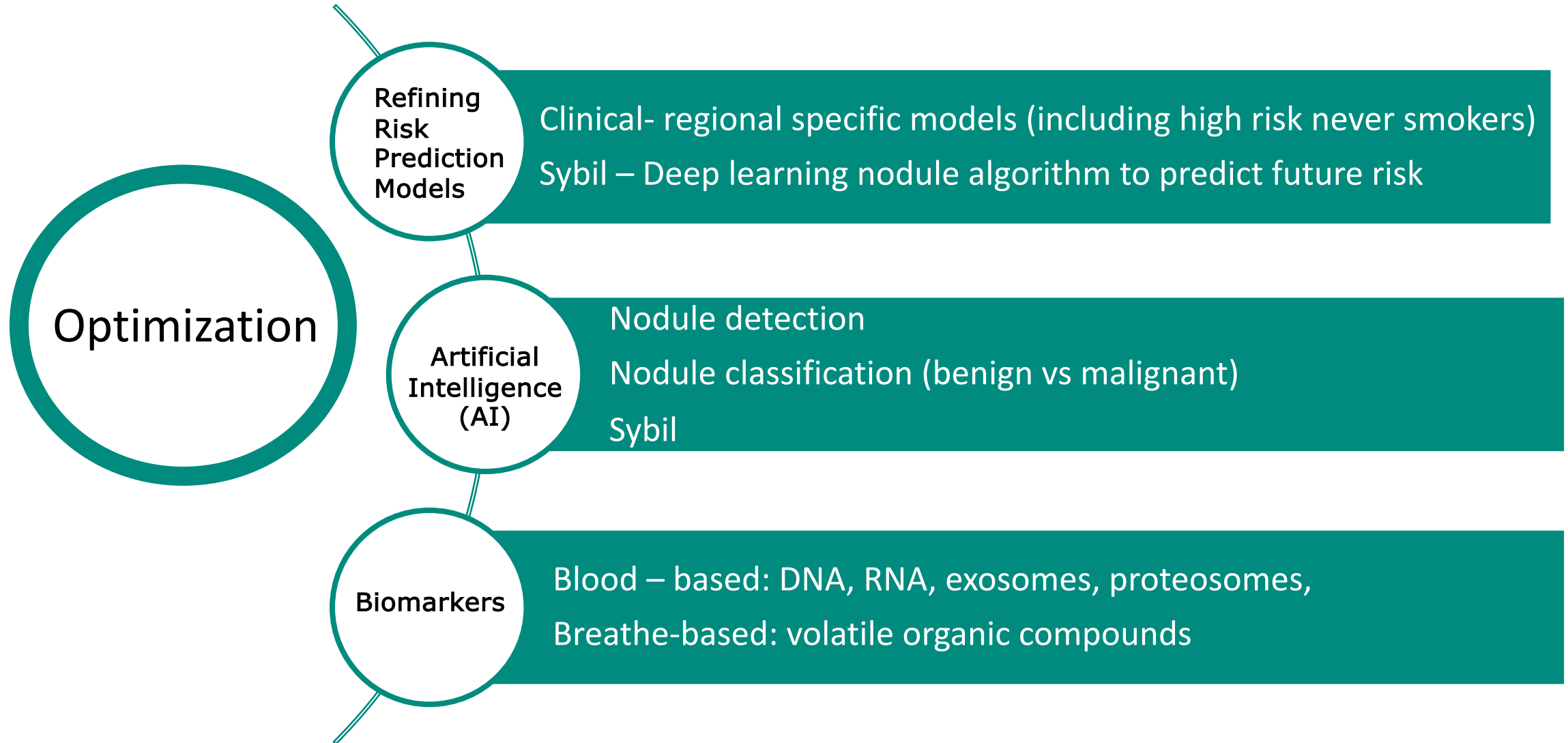
Increasing Screening Centers is One Component

Future Directions in Lung Cancer Screening

Optimization

Refining Risk Prediction Models

Clinical- regional specific models (including high risk never smokers)

Sybil – Deep learning nodule algorithm to predict future risk

Artificial Intelligence (AI)

Nodule detection

Nodule classification (benign vs malignant)

Sybil

Biomarkers

Blood – based: DNA, RNA, exosomes, proteosomes,

Breathe-based: volatile organic compounds

Take Home Message

- Low Dose CT Screening for Lung Cancer Saves Lives!

- The number of screening centers must increase to save more lives.

- We must tackle the societal and health systems barriers to establishing screening centers simultaneously.

- There are resources such as the LCPN and the ACS toolkits that are available to assist in establishing and refining screening centers.

It starts with finding a diverse group of champions.