LUNGEVITY

Find it. Treat it. Live.

LUNG CANCER EARLY DETECTION: HOW DO WE HELP MORE PEOPLE?

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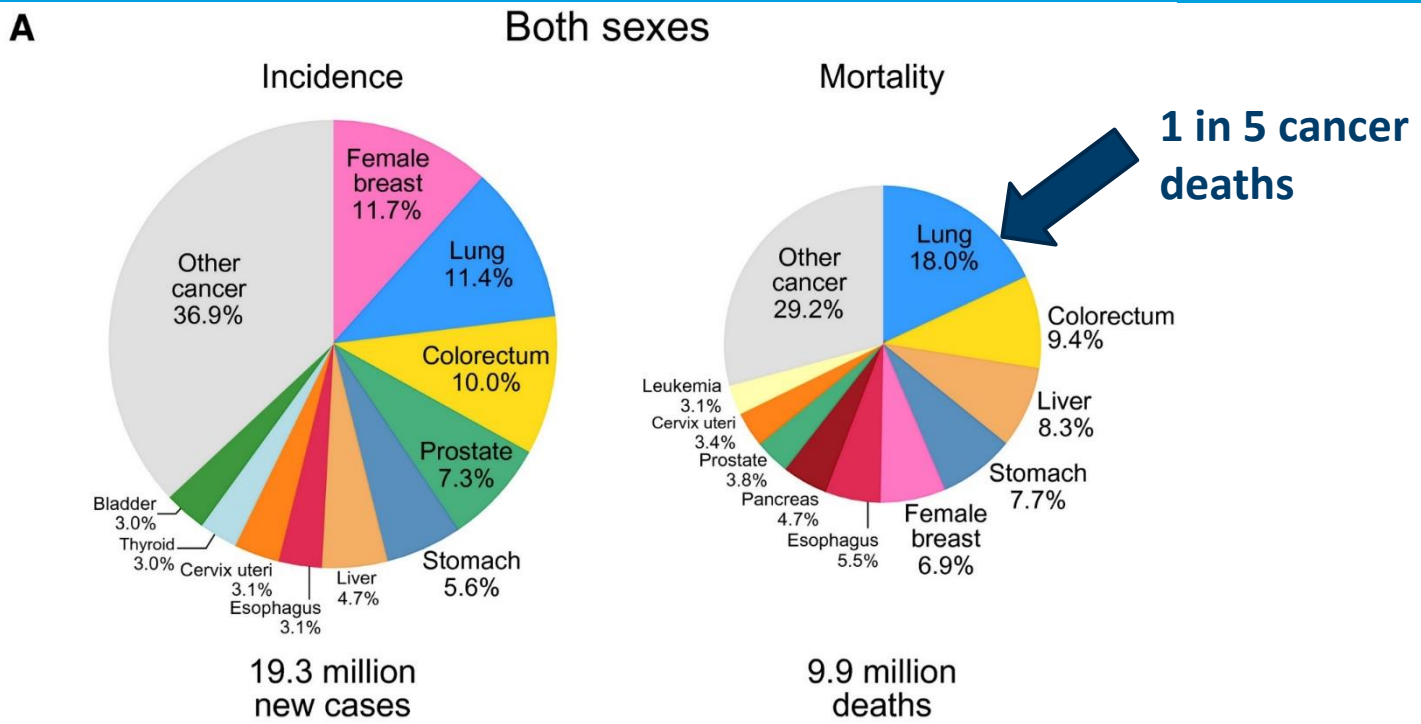
January 21, 2023

AGENDA

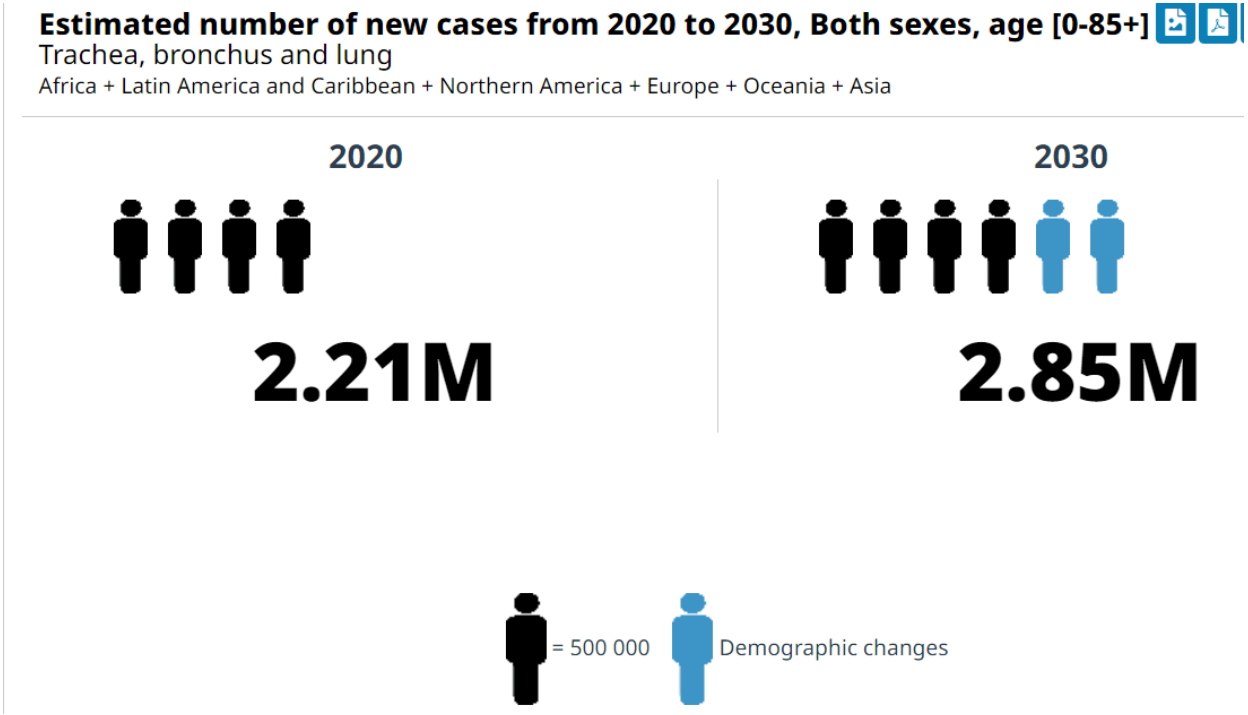
- General LC stats
- LDCT screening
- IPN management
- Biomarker discovery
- Patient story
- LUNGevity’s early detection work

GLOBAL EPIDEMIOLOGY OF CANCER



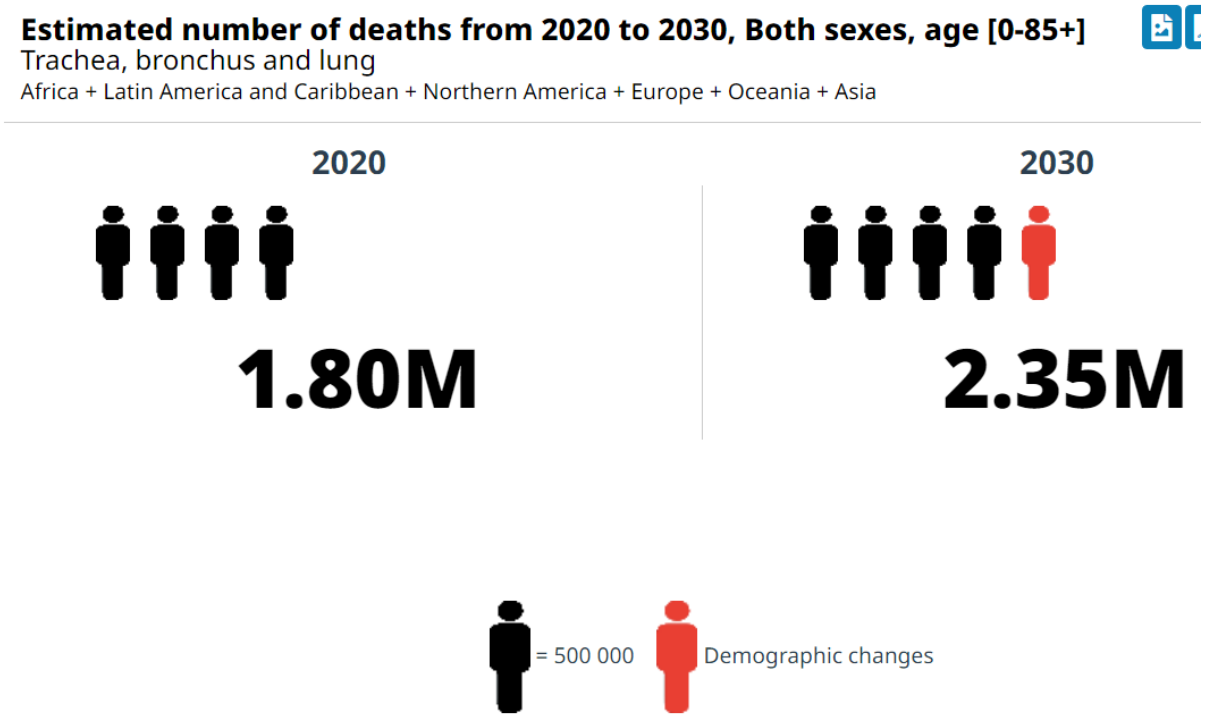
From: Global Cancer Statistics 2020; Sung et al, 2021 - https://doi.org/10.3322/caac.21660

ESTIMATED NEW LUNG CANCER CASES (2030)



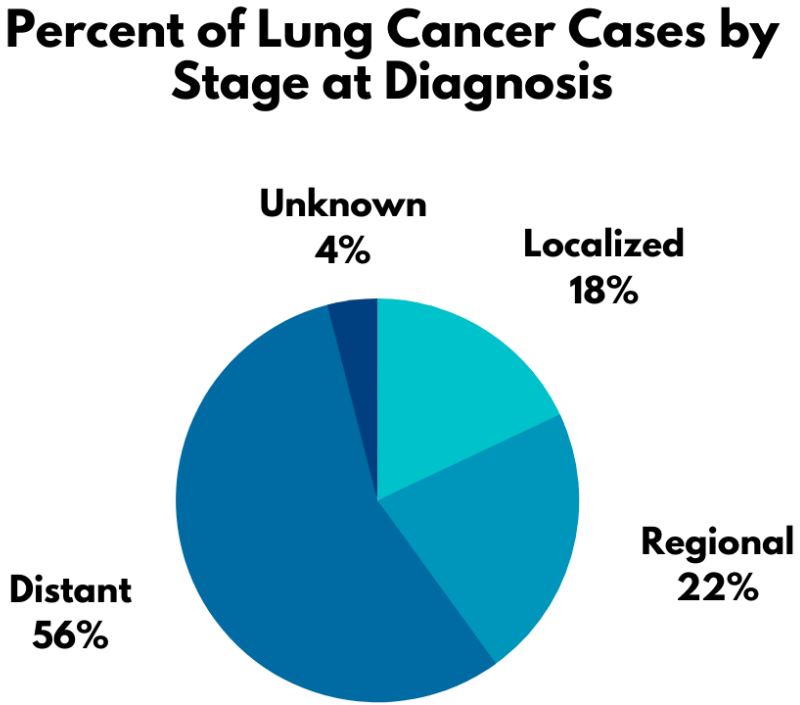
From: Global Cancer Observatory, https://gco.iarc.fr/

ESTIMATED NEW LUNG CANCER DEATHS (2030)



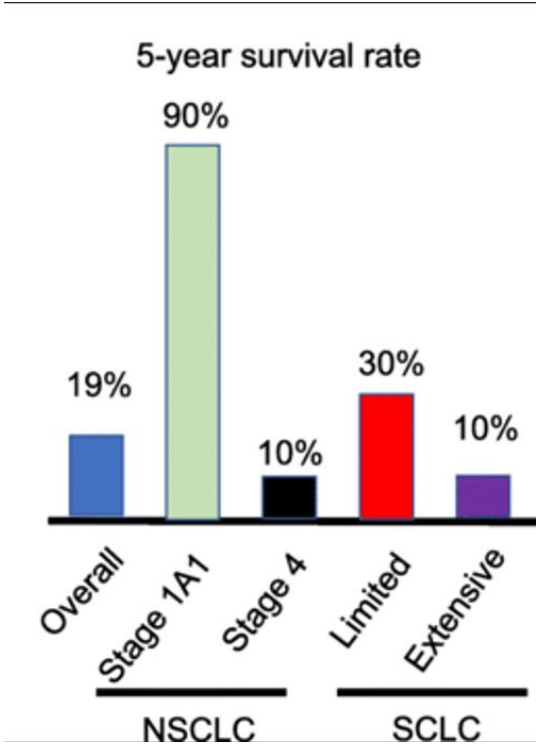
From: Global Cancer Observatory, https://gco.iarc.fr/

MOST LUNG CANCERS DIAGNOSED AT LATE STAGES



https://prevention.cancer.gov/sites/default/files/uploads/news_and_event/cpsb-percent-lung-cancer-cases-stage.png

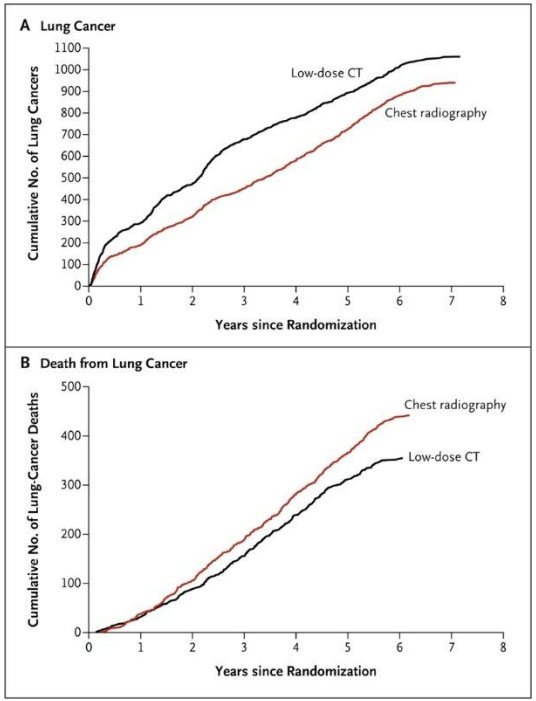
5-YEAR LUNG CANCER SURVIVAL BY STAGE



Li et al. Molecular Cancer (2021) 20:22 https://doi.org/10.1186/s12943-021-01312-y

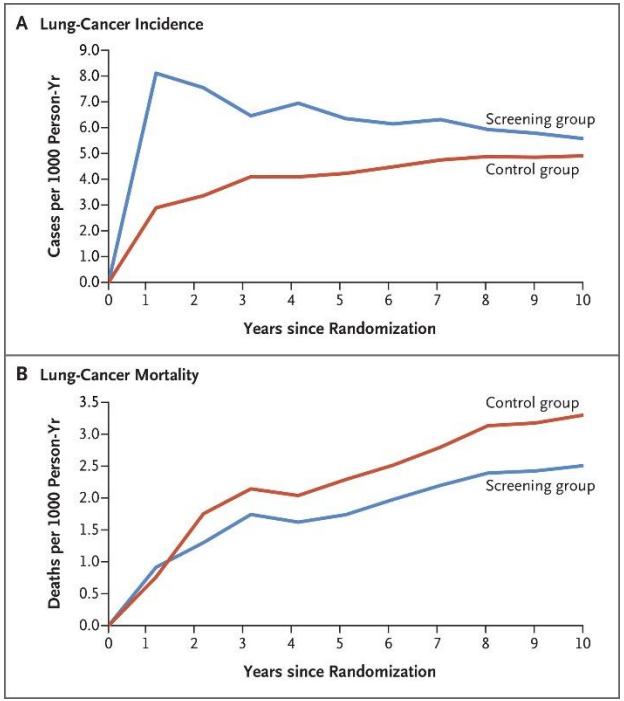
LDCT SCREENING REDUCES LUNG CANCER DEATHS

NLST



N Engl J Med 2011; 365:395-409

NELSON



N Engl J Med 2020; 382:503-513

LDCT SCREENING BENEFIT

Female v Male Ratio (%)	
NLST	41/59
NELSON	16/84

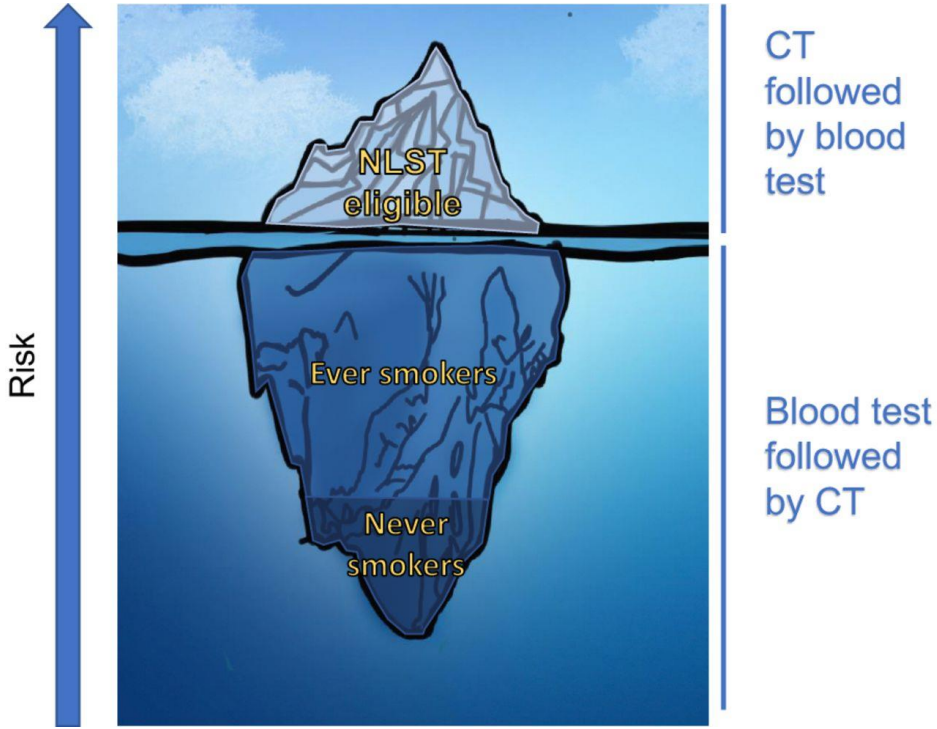
Percent LC Mortality Decrease			
Trial	Men	Women	50:50 M/F
NLST	8%	27%	18%
NELSON	26%	39-61%	33 – 44%

https://www.sciencedirect.com/science/article/pii/S2059702920301277

LDCT IMPLEMENTATION CHALLENGES

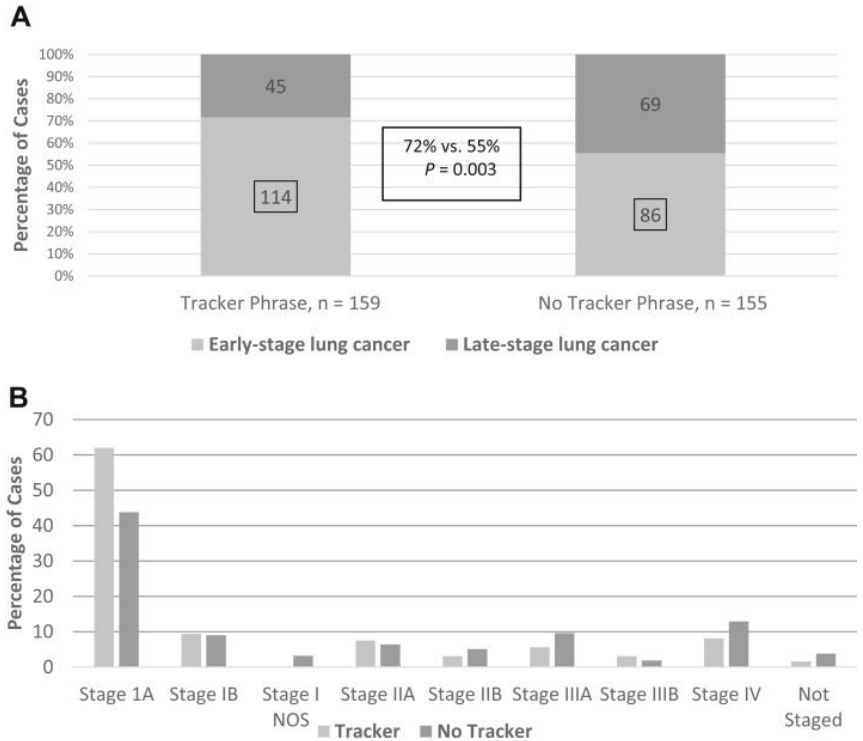
- Only 5 – 10% uptake in US
- Role of stigma
- Disparities in screening
- USPSTF criteria still miss many
- Screening programs not implemented globally

LDCT SCREENING - THE TIP OF THE ICEBERG



Ostrin EJ, et al *Cancer Epidemiol Biomarkers Prev* (2020) 29 (12): 2411–2415.

IPN PROGRAM HELPS STAGE SHIFT DISEASE



Carr LL et al. JTO Clin Res Rep. 2022 Mar; 3(3): 100297

IPN PROGRAM IN MEDICARE POPULATION

Patient, Disease, Treatment Characteristics and Outcomes
LDCT v ILNP v MDC

Variable	LDCT	ILNP	MDC	P-value
Number of patients	157/5659 (2.7%)	772/15461 (5%)	1112/1779	
Age, median (Q1-Q3)	65 (60 -70)	64 (15-73)	66 (58 - 73)	<0.0001
Female sex, n (%)	2792 (49)	8641 (56)	917 (52)	<0.0001
Race, n (%)				<0.0001
White	4552 (80)	10,154 (66)	1192 (67)	
Black or African American	1033 (18)	4471 (29)	544 (31)	

Clinical stage, n (%)				<0.0001
I/II	92 (59)	409 (53)	418 (38)	
III	25 (16)	130 (17)	272 (24)	
IV	30 (19)	140 (18)	303 (27)	
Tumor size mm, m (Q1 – Q3)	20 (13 - 33)	25 (16 - 41)	35 (22 - 55)	<0.0001

Eligibility for LDCT lung cancer screening, n (%)	ILNP	MDC
USPSTF 2013 criteria	314 (41)	453 (41)
USPSTF 2021 criteria	365 (47)	571 (51)

Treatment				<0.0001
Surgery Alone	50 (32)	222 (29)	154 (14)	
Surgery (+ Other Modalities)	21(14)	77 (10)	168 (15)	

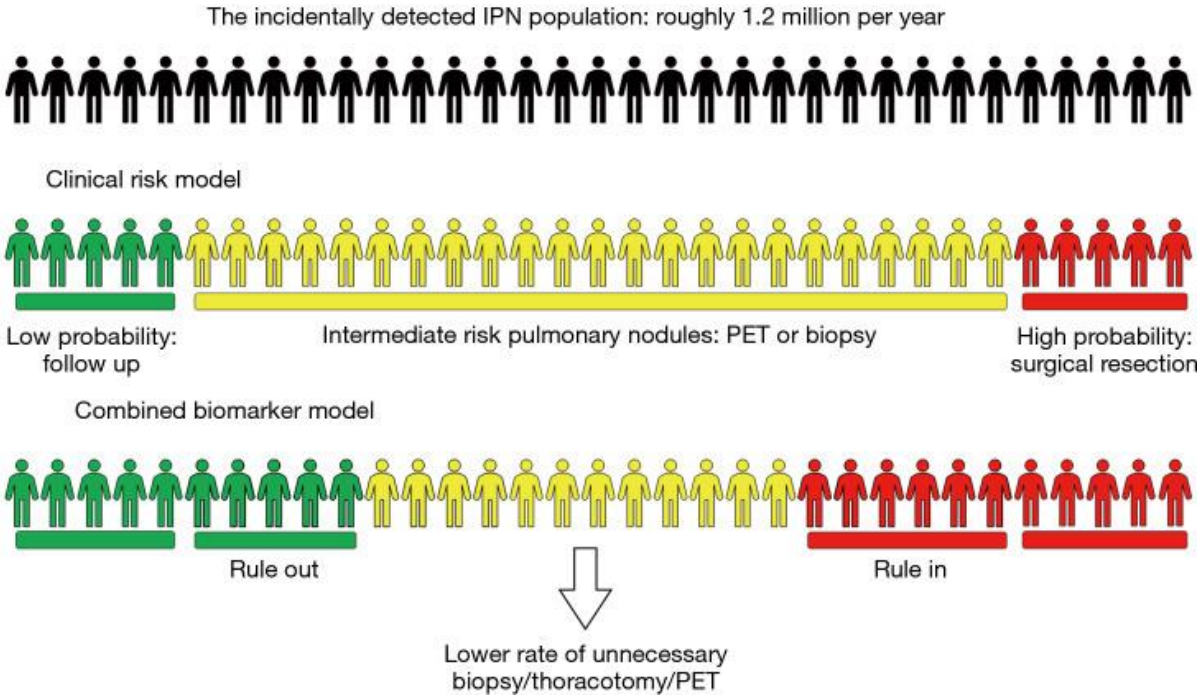
5-year OS (95% CI)	LDCT	ILNP	MDC	p
Aggregate	70 (57, 85)	55 (50, 61)	45 (41, 49)	<0.0001
Stage I/II	80 (66, 98)	69 (63, 76)	61 (55, 68)	0.0043
Stage III	68 (46, 100)	36 (27, 48)	42 (35, 51)	0.13
Stage IV	45 (27, 74)	31 (22, 45)	24 (18, 31)	0.23
Adjusted Hazard Ratio (95% CI)*			Ref	
Aggregate	0.44 (0.28, 0.70)	0.80 (0.63, 1.00)	1 (---)	<0.0001
Stage I	0.24 (0.08, 0.69)	0.50 (0.30, 0.85)	1 (---)	0.0009
Stage II	0.56 (0.12, 2.67)	0.94 (0.44, 2.02)	1 (---)	0.4
Stage III	0.55 (0.19 , 1.53)	1.02 (0.64, 1.65)	1 (---)	0.01
Stage IV	0.57 (0.27, 1.10)	0.94 (0.64, 1.37)	1 (---)	0.1

*Adjusted for age, race, insurance, smoking status, Charlson comorbidity score, histology, stage

Osarogiagbon et al. MA 10.02: LDCT v ILNP v MDC. 09/12/21

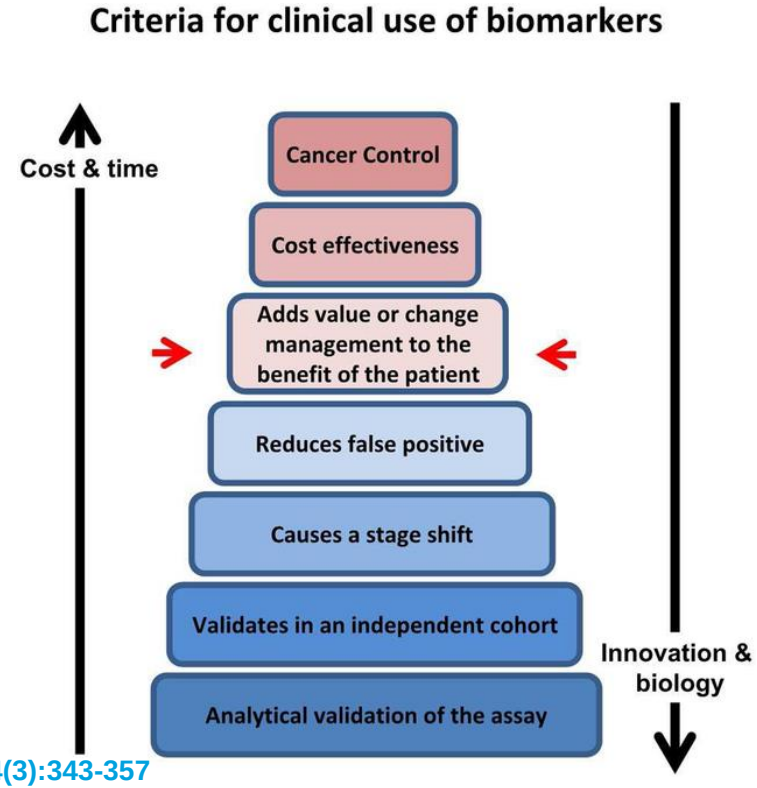
https://www.ilcn.org/ongoing-research-looks-at-optimizing-lung-cancer-screening-programs/

BIOMARKERS FOR IPN STRATIFICATION



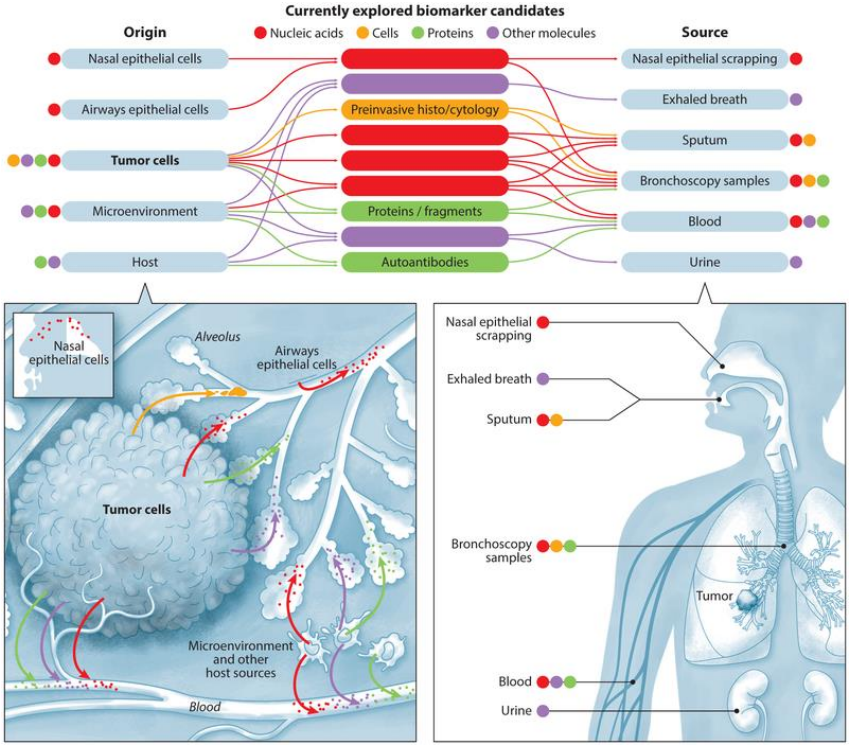
Kammer MN and PP Massion . J Thorac Dis 2020 Jun;12(6):3317-3330

BIOMARKERS TO IMPROVE EARLY DETECTION



Seijo LM et al J Thorac Oncol 2019 Mar;14(3):343-357

BIOMARKERS/SOURCES UNDER INVESTIGATION



Seijo LM et al J Thorac Oncol 2019 Mar;14(3):343-357

CAN LIQUID BIOPSY REPLACE LDCT?

- Much research underway to identify/validate biomarkers
- While MCEDs show promise, more work needed
- Liquid biopsies may complement, but not replace, early detection
  - Risk stratification for LDCT
  - Clinical decision making for IPN
- Liquid biopsy may be employed if patient refuses LDCT or if screening is not feasible

PATIENT STORY – TERRI ANN DIJULIO

- IPN found in ER, age 42, watched for 2 years, Dx with LC age 44
- Tobacco history, not enough to meet screening criteria
- NED 11 years then Dx with 2nd LC
- NED 5 years, 3rd Dx 18 months ago
- F/U critical
- Unexpected consequences: stroke 5 years ago, concurrent with 2nd Dx
- Family story
- >65 scans in 17 years
- Important that doctor knows who you are and your goals
- Journey into activism

PATIENT STORY – TERRI ANN DIJULIO

"Early detection has gifted me with time to chase my dreams and live an extraordinary life." – Terri Ann DiJulio

HOW DO WE DETECT MORE LUNG CANCER EARLY?

- Coordinated efforts among stakeholders (researchers, physicians, regulators, payors, patient advocacy groups) to expand LDCT uptake
- Implementation of nodule management programs to ensure follow-up
- Sustained investment in biomarker discovery and clinical validation

LUNGEVITY – PATIENT DRIVEN ORGANIZATION

LUNGevity is…

About people diagnosed with lung cancer and ***For*** people diagnosed with lung cancer

LUNGEVITY MISSION AND VISION

LUNGevity Foundation is firmly committed to making an immediate impact on increasing quality of life and survivorship of people with lung cancer by accelerating research into early detection and more effective treatments, as well as by providing community, support, and education for all those affected by the disease.

Our vision is a world where no one dies of lung cancer

TODAY, WE ARE FOCUSED ON TWO GOALS:

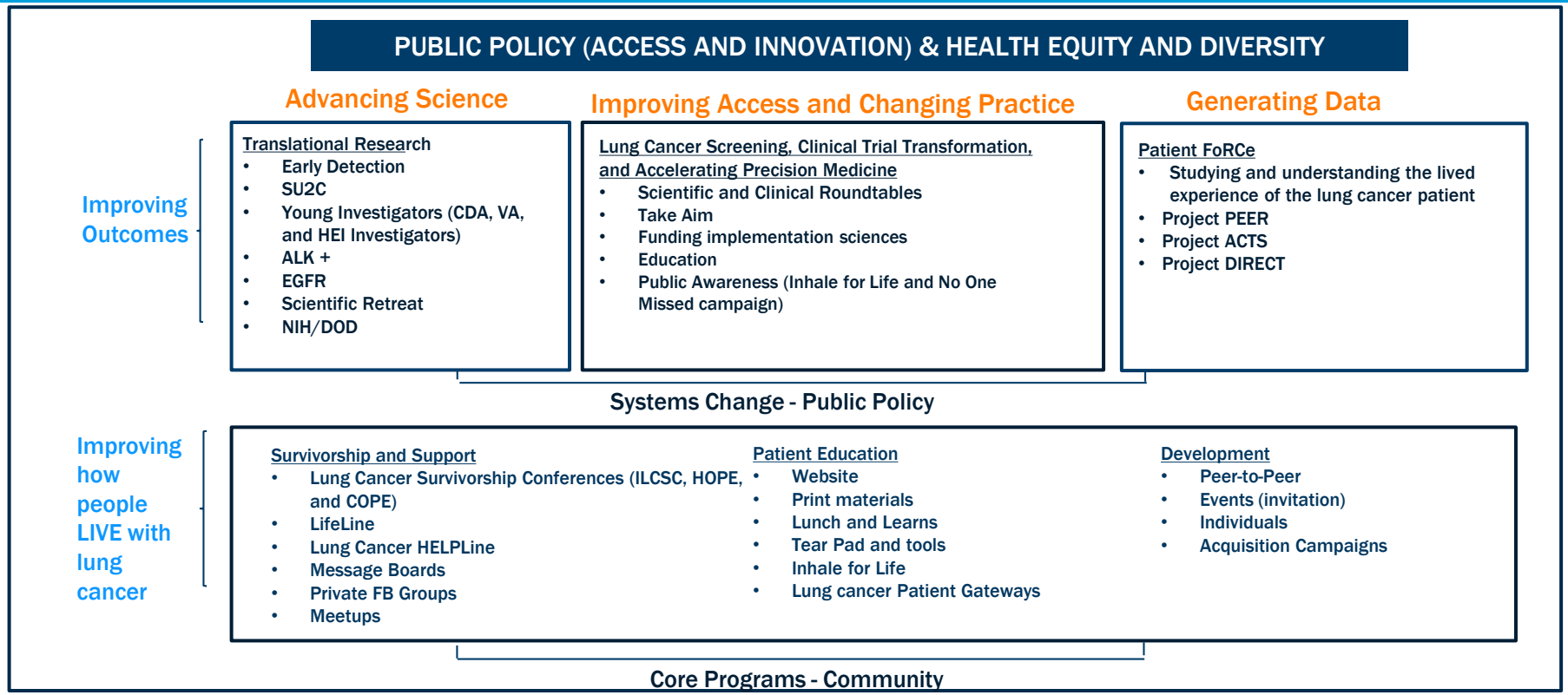
Improve outcomes

for people diagnosed with lung cancer

Improve how people live

with lung cancer

HOW DO WE ACHIEVE OUR GOALS?



A patient-centered approach to lung cancer screening adherence

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MOFFITT CANCER CENTER

Cancer Center
NCI-DESIGNATED CANCER CENTER

HealthCare
MARKEY CANCER CENTER

Developing a patient-centric and clinician-vetted toolkit to promote lung cancer screening adherence

Phase 1

Aim 1:

Identify barriers and facilitators to screening adherence

Develop LCS toolkit components to reduce barriers and enhance facilitators

Phase 2

Aim 2: Conduct usability testing with targeted and tailored LCS toolkit

Phase 3 (Ongoing)

Aim 3: Examine feasibility and acceptability of LCS toolkit

acts
ADHERENCE TO CT SCREENING

Summary of Phase I Research

- 15 screening center staff (directors and clinic coordinators) and 8 participants interviewed and surveyed

- Domains of questioning focused on:
  - Strengths and weaknesses of overall screening program
  - Perception and elements of program success (and experience)
  - Opportunities for improvement (including training opportunities)
  - Examples of Facilitator and Barriers

Facilitators of adherence	Barriers to adherence
• Personalized delivery of screening results	• Passive scheduling reminder system
• Multiple methods of communication	• Poor facility signage
• Flexibility in scan timings	• Too few locations to have scans performed

Addressing barriers to adherence: Incorporating voices from the community

Phase 2 – Usability testing of toolkit

- 12 screen-eligible participants (uninsured, AA, women, rural, health literacy level)
- 12 screening center staff members (community vs. academic, rural vs. urban, decentralized vs. centralized)

FINANCIAL NAVIGATION

Include clear information on how to pay for follow-up scans

HEALTH LITERACY

Conduct a health literacy check of all participant-facing communication and materials

PRACTICE SETTING

Develop intervention that can be integrated into practice needs

SMOKING CESSATION

Include smoking cessation in non-stigmatizing language

LOGSTICS/TRANSPORTATION

Include info on parking fees, public transit routes, landmarks, weekend or evening hours

DELIVERY OF SCAN RESULTS

Information on guideline-driven scan results, communication preferences

Phase 3 (Ongoing)- Feasibility and Acceptability
(two-arm, parallel groups randomized feasibility trial)

SITE (N=8)

1. Colorado Cancer Coalition Lung Cancer Task Force
2. Kentucky LEADS
3. Moffitt (LATTE)

Participant Demographics (N = 25 at each site)

1. Low SES
2. Rural/urban
3. REM
4. Health literacy

Screening center staff

R

EHR data

Stakeholder surveys and interviews

PROJECTS TO INCREASE UPTAKE OF LCS

***Project URBANA (peer navigation model)*:**

Increasing Access to LUng Cancer ScReening in the Bronx in LAtinx and AfricaN American Communities

***Project ASCENT (patient navigation model)*:**

Understanding barriers to lung CAncer Screening in the LaTinx/HISPANIC community in an urban setting (Miami dade county)

USING A PATIENT OR A PEER NAVIGATION PROGRAM TO INCREASE ACCESS TO LCS

Development and implementation of a culturally sensitive, geographically tailored, and patient centric LCS education program, coupled with comprehensive navigation will increase uptake and adherence to LCS in underserved communities in the Bronx and in the Miami Dade country area

Patient navigation model

1

Developing a culturally sensitive Patient Navigation program

2

Community engagement, screening , and care linkage

3

Social Determinants of Health, Barriers and Facilitators, and Distress Assessment

LUNGEVITY PARTNERS WITH ALA AND SU2C

LUNGevity partnered with American Lung Association and SU2C in 2017 to form a Dream Team focused on lung cancer early detection and interception

LUNGevity Announces Funding Opportunity for First-Ever Lung Cancer Early Detection and Interception Dream Team

Call for ideas for SU2C-LUNGevity-American Lung Association collaboration

FOR IMMEDIATE RELEASE

Media Contact
Linda Wenger
lwenger@lungevity.org
(973) 449-3214

WASHINGTON, DC (February 6, 2017) – Building on the Foundation's more than seven years of strategic investment in early detection research, LUNGevity Foundation, in collaboration with Stand Up To Cancer (SU2C) and the American Lung Association (through its LUNG FORCE initiative), is pleased to announce that the American Association for Cancer Research (AACR), SU2C's scientific partner, has issued a Call for Ideas for research proposals that focus on lung cancer early detection and interception: catching precancerous cells and blocking them from turning into cancer cells. The interdisciplinary and multi-institutional SU2C-LUNGevity-American Lung Association Lung Cancer Interception Dream Team will be the first of its kind, with up to $7 million in funding support.

EARLY DETECTION AND INTERCEPTION

Dr. Steve Dubinett, L
Dr. Avrum Spira, R

***SU2C-LUNGevity Foundation-American Lung Association Lung Cancer Interception Dream Team*:**
Intercept Lung Cancer Through Immune, Imaging, & Molecular Evaluation (InTIME)

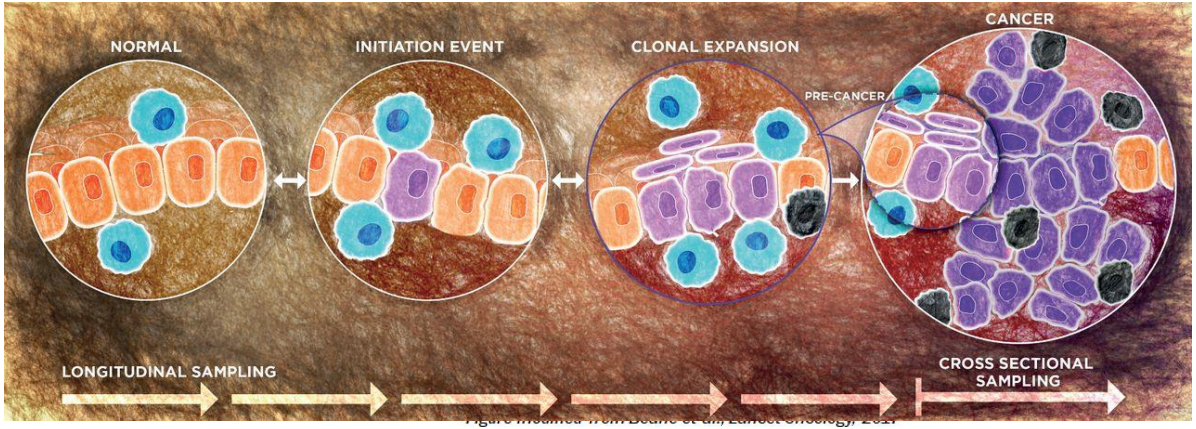


Figure from: Campbell et al, Cancer Prev Res (Phila) . 2016 Feb;9(2):119-24. doi: 10.1158/1940-6207.CAPR-16-0024.

PIERRE MASSION YOUNG INVESTIGATOR AWARD FOR EARLY DETECTION RESEARCH

EARLY LUNG CANCER CENTER

Form a multi-pronged approach to early diagnosis and intervention

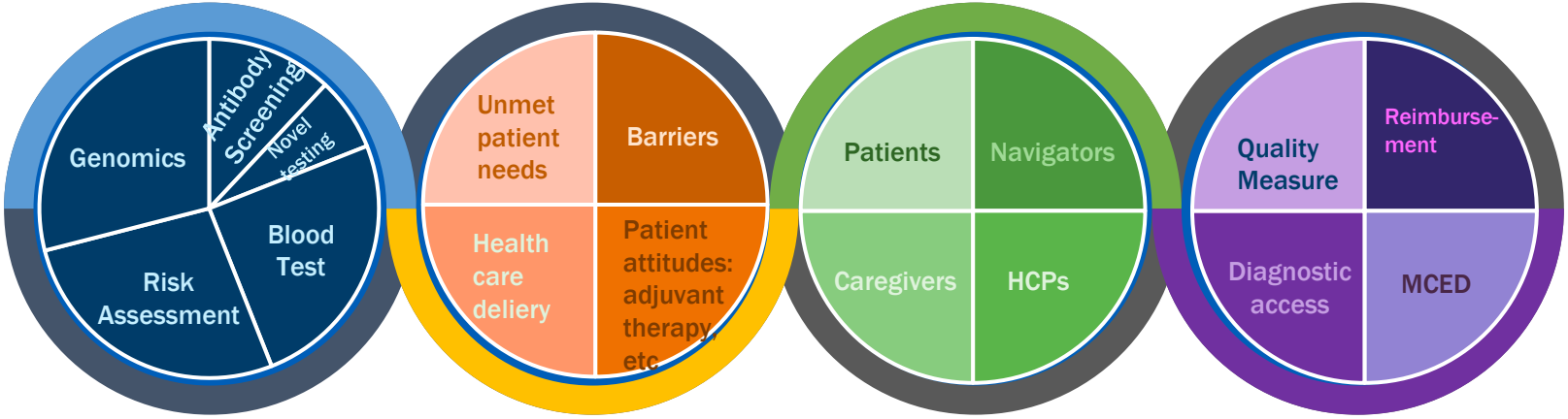
Amplifying our commitment to early detection and early disease management

Fund Research (Science)

Conduct Research: Early detection, diagnosis and intervention

Education & engagement

Policy: Reaching the community



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