The Mid-South Miracle:
Implementing Structured Lung Cancer Care Delivery in a High-Risk Population

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Osarogiagbon RU. 'The Mid-South Miracle.' Fred Hutch Cancer Center Value in Cancer Care Summit 2023. November 2, 2023.

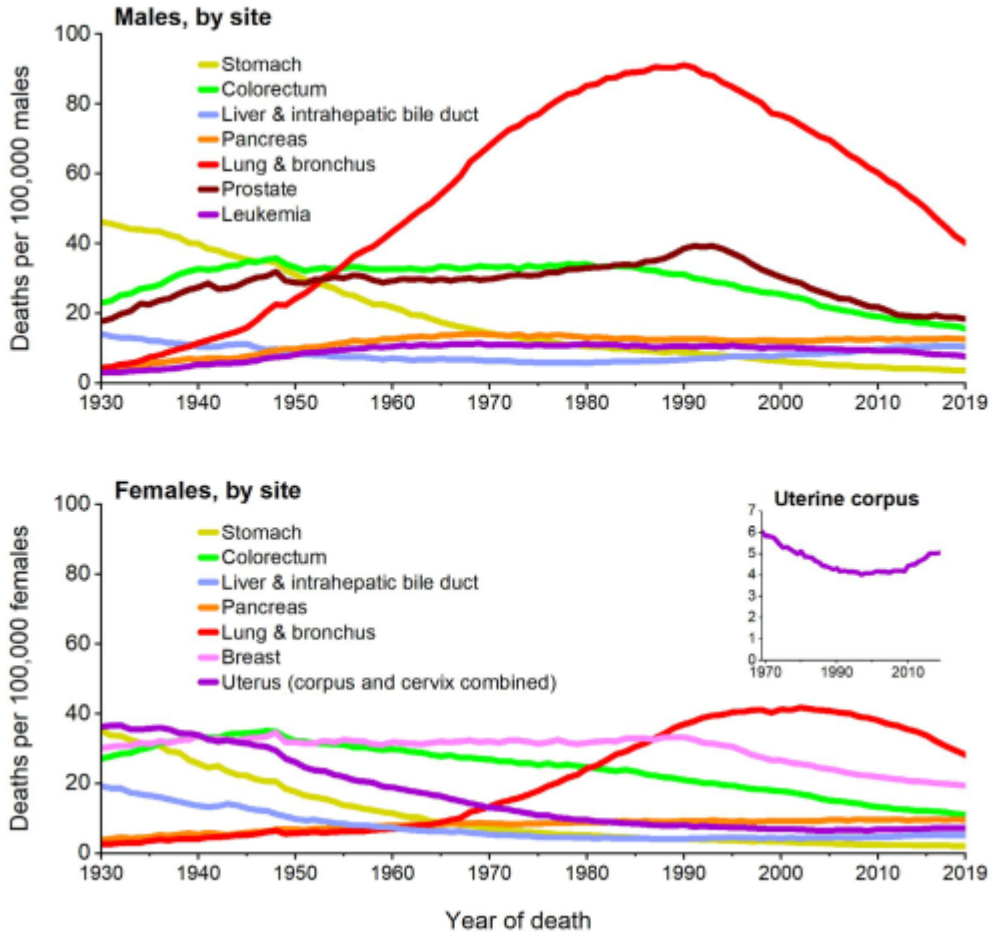
DECLARATIONS

Chair:	Board of Directors, Hope Foundation for Cancer Research (SWOG)
Co-chair:	IASLC N-Staging Sub-Committee, IASLC Prognostic Factors Subcommittee; SWOG Early Lung Cancer Sub-Committee
Consultant:	American Cancer Society, AstraZeneca, Genentech/Roche, National Cancer Institute
Member:	Fleischner Society
Patents:	Lymph node specimen collection kit, Method for lymph node analysis
Scientific Advisory Board:	National Cancer Institute, Druckenmiller Center for Lung Cancer Research, MSKCC; GO2 Foundation; Lung Cancer Foundation of America; LUNGevity Foundation; University of Pennsylvania Telehealth Research Center of Excellence (TRACE); Dartmouth Health Center of Biomedical Research Excellence (COBRE); Fred Hutch Cancer Center, Hutchinson Institute for Cancer Outcomes Research (HICOR); AstraZenaca US Lung Ambition Advisory Council; Median Technologies, Nice, France.
Speaker:	Medscape, Tryptych Healthcare Partners
Steering Committee:	National Lung Cancer Round Table, NCI Cancer Prevention Steering Committee, Genentech Inc SKYSCRAPER-15 (G045006).
Stock:	Eli Lilly, Gilead Sciences, Pfizer, Bridge Bio

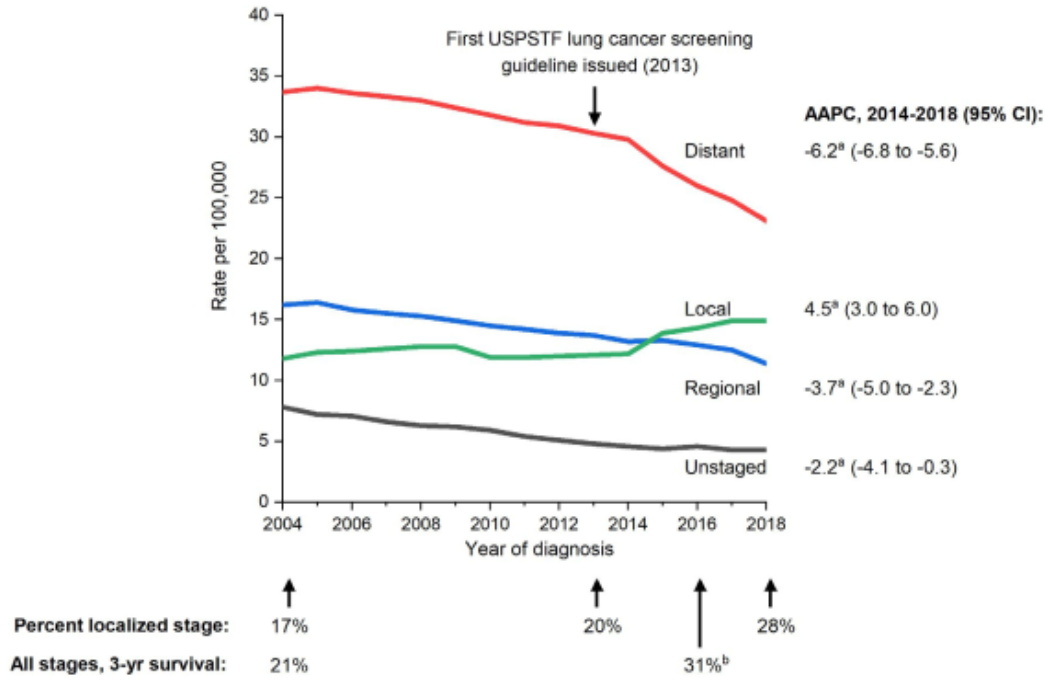
Take-Home Messages

- Lung Nodule Programs provide a robust, complementary, epidemiologically sound pathway to early lung cancer detection.
  - Provides access to early detection to a non-overlapping, high-risk population.
  - Concurrent deployment alleviates looming disparities inadvertently induced by LDCT.
  - Can be implemented even when LDCT unavailable.
- Multidisciplinary decision-making saves lives, synthesizes decision-making.
- Close attention to surgical quality a vital component for population impact.
- Program-based care creates the shortest pathway to population-level lung cancer outcomes improvement.
- ***The best treatment is a clinical trial***; build clinical trials infrastructure where the population is.

The Good News: Evolving US Lung Cancer Statistics

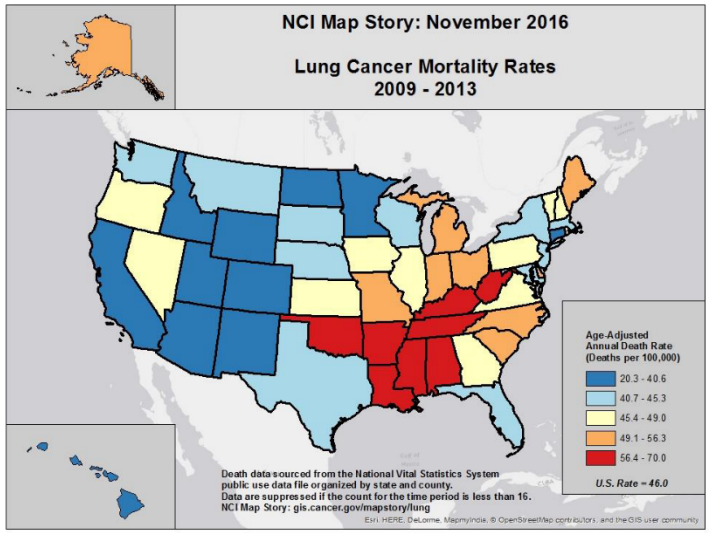


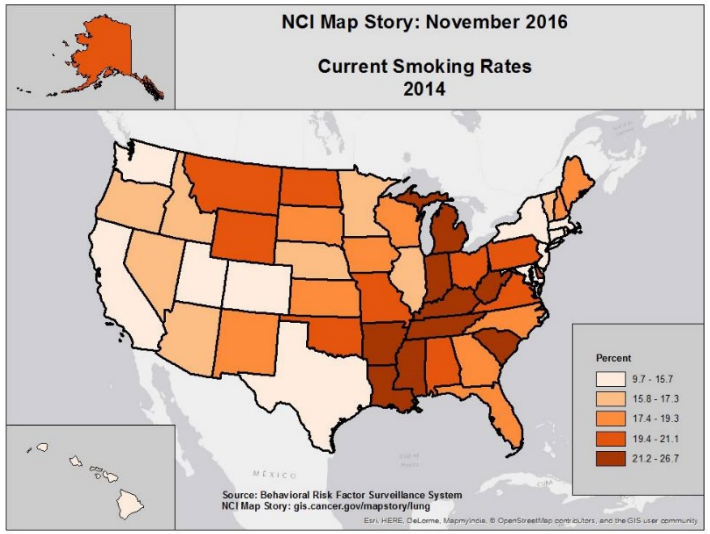
Cancer Statistics, 2022

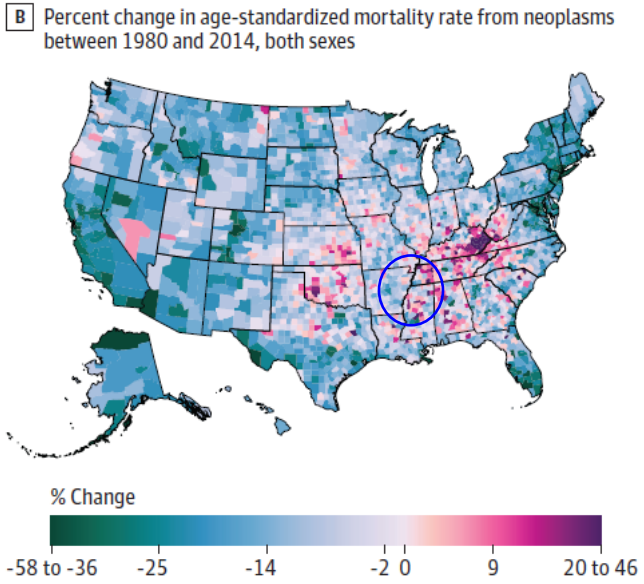


Siegel RL, Miller KD, Fuchs HE, Jemal A. Cancer statistics, 2022. CA Cancer J Clin. 2022 PMID: 35020204.

Epidemiology of Lung Cancer in the US:
A Tale of Geographic Disparity

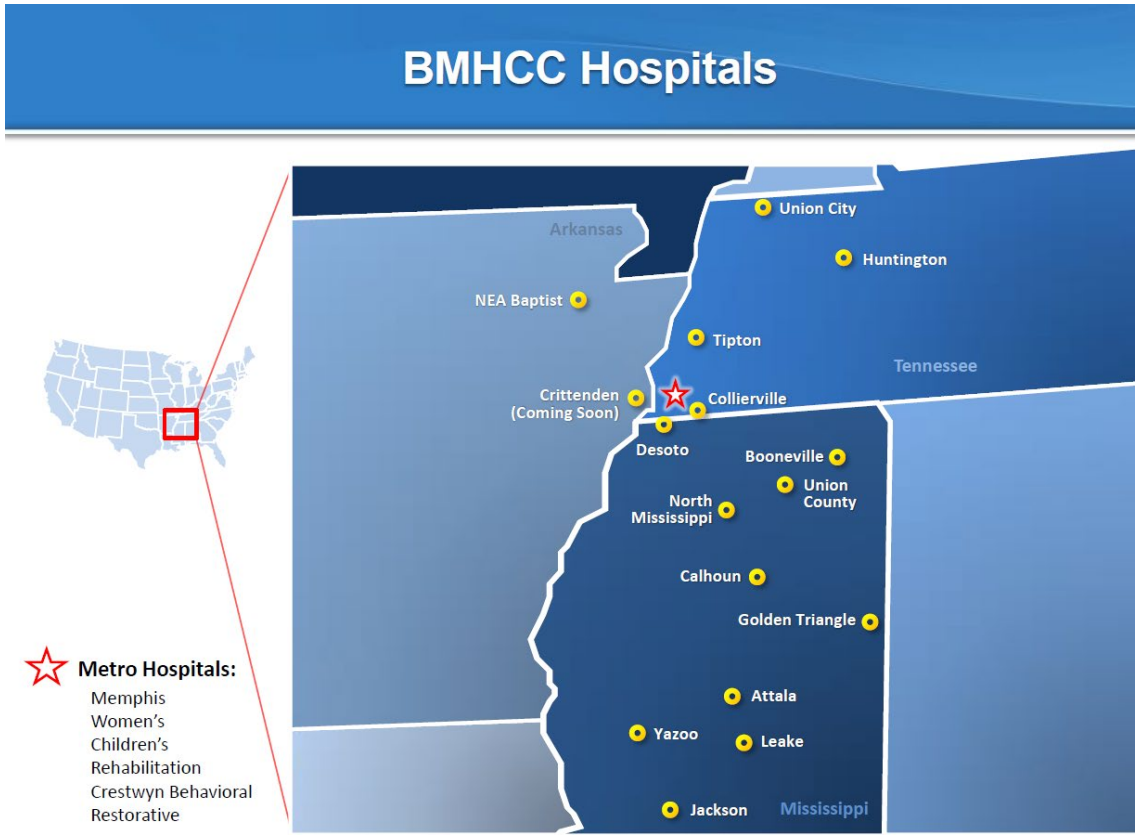






Trends and Patterns of Disparity in Cancer Mortality Among US Counties. Mokdad AH et al, JAMA.2017; 317(4):388-406.

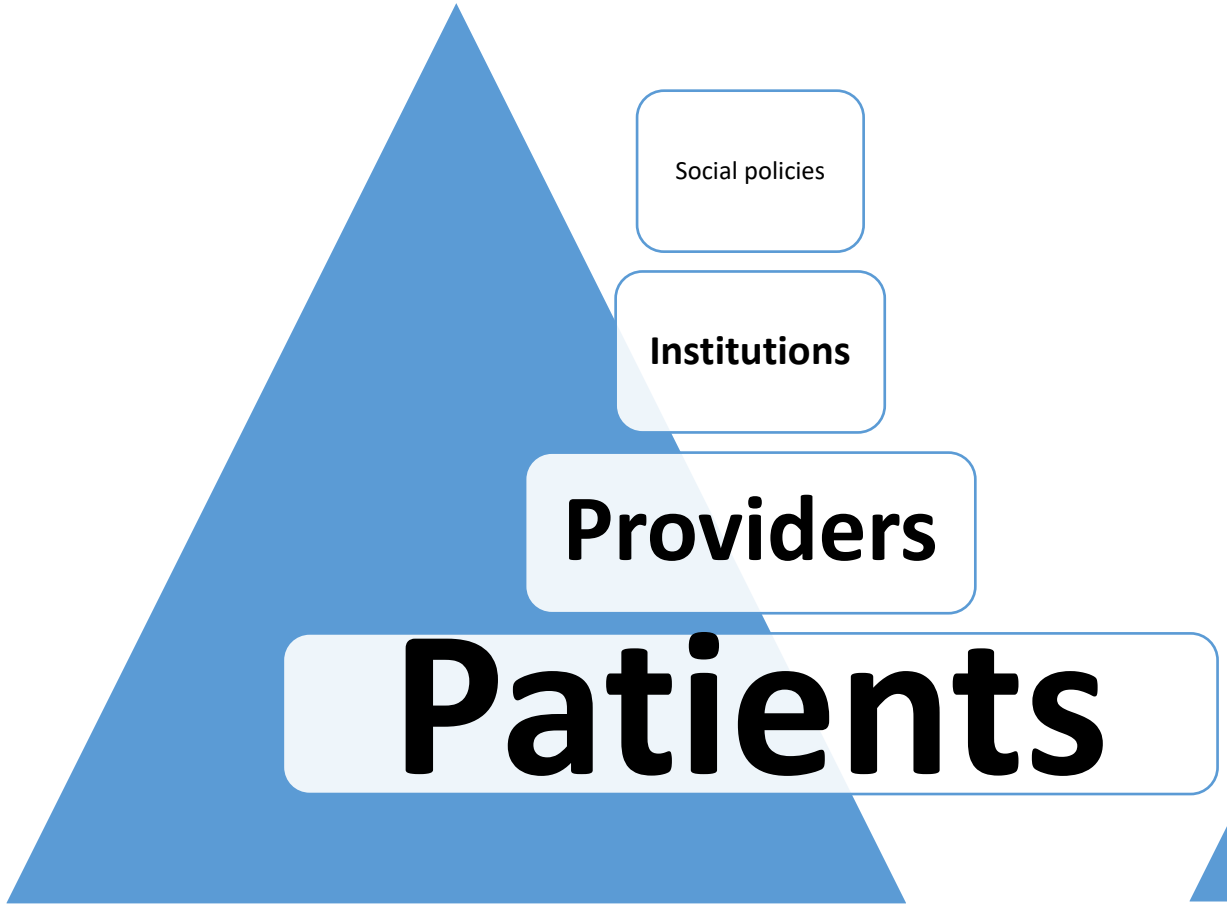
If BMHCC was a state….



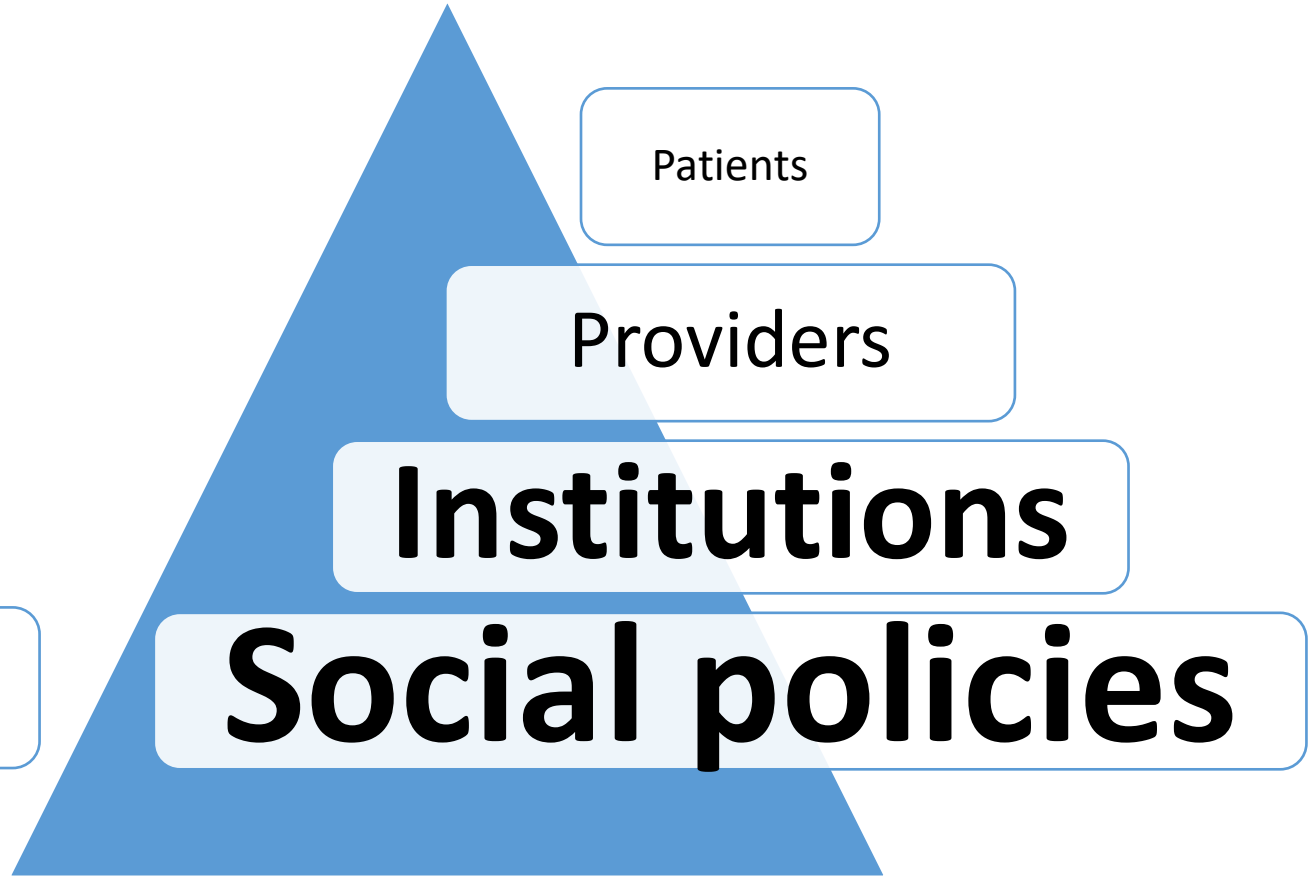
	State	Estimated new lung cancer cases, 2020[1]	NCI-Designated Cancer Center?
37	Nebraska	1270	1
38	New Hampshire	1220	1
	BMHCC	**1200 - 1300**	**0**
39	New Mexico	1040	1
40	Idaho	990	0
41	Rhode Island	920	0
42	Delaware	890	0
43	Hawaii	870	1
44	Montana	770	0
45	Utah	730	1
46	South Dakota	590	0
47	Vermont	570	0
48	North Dakota	460	0
49	Alaska	400	0
50	Wyoming	320	0
	DC	300	1

[1] Siegel RL, Miller KD, Jemal A. Cancer Statistics, 2020. CA Cancer J Clin 2020;70:7-30.

Inverse proportionality between number of targets and intervention leverage



Number of intervention targets



Impact of intervention target

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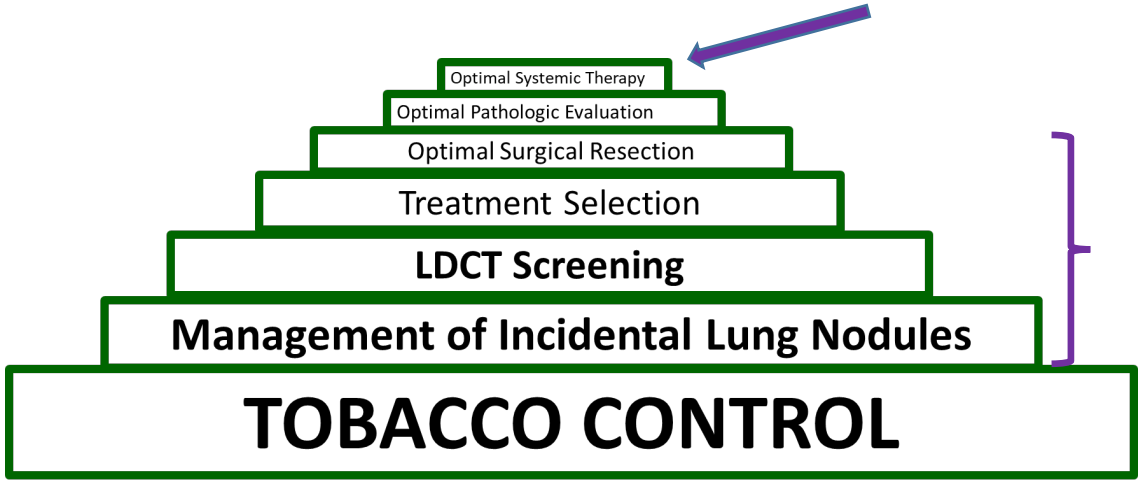
Implementing The Mid-South Miracle:

Goal: Reduce Lung Cancer Mortality >25% Over 10 Years

Objectives: sustained, rigorous implementation of seven specific clinical programs

The Population Impact Pyramid



A Three-Tiered Approach

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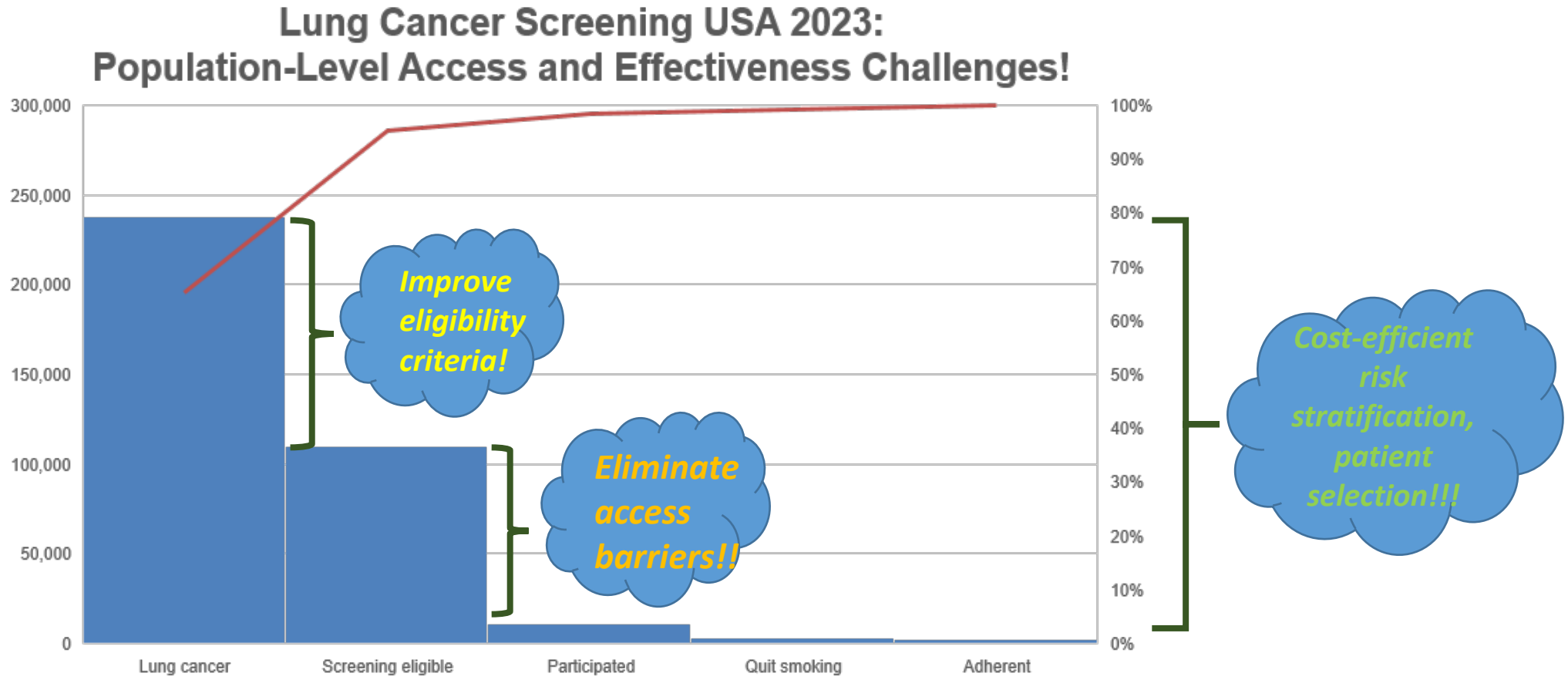
Lung Cancer Screening Saves Lives! But…



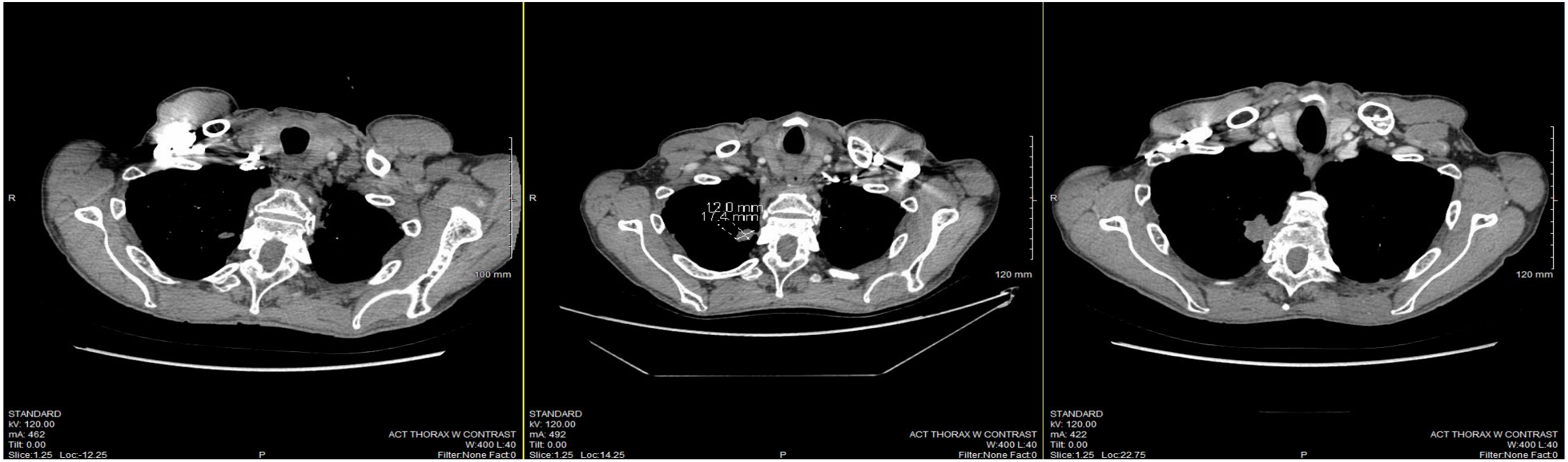
Osarogiagbon, Yang, Sequist. ASCO Educational Book 2023

BURDEN

Lung Cancer Mortality Rate Per 100,000 Adults 55-80 years (2013-2017)

Fedewa SA, et al. J Natl Cancer Inst. 2020. PMID: 33176362.

Avoid this… save lives!



February, 2020 **June, 2020** **April, 2021**

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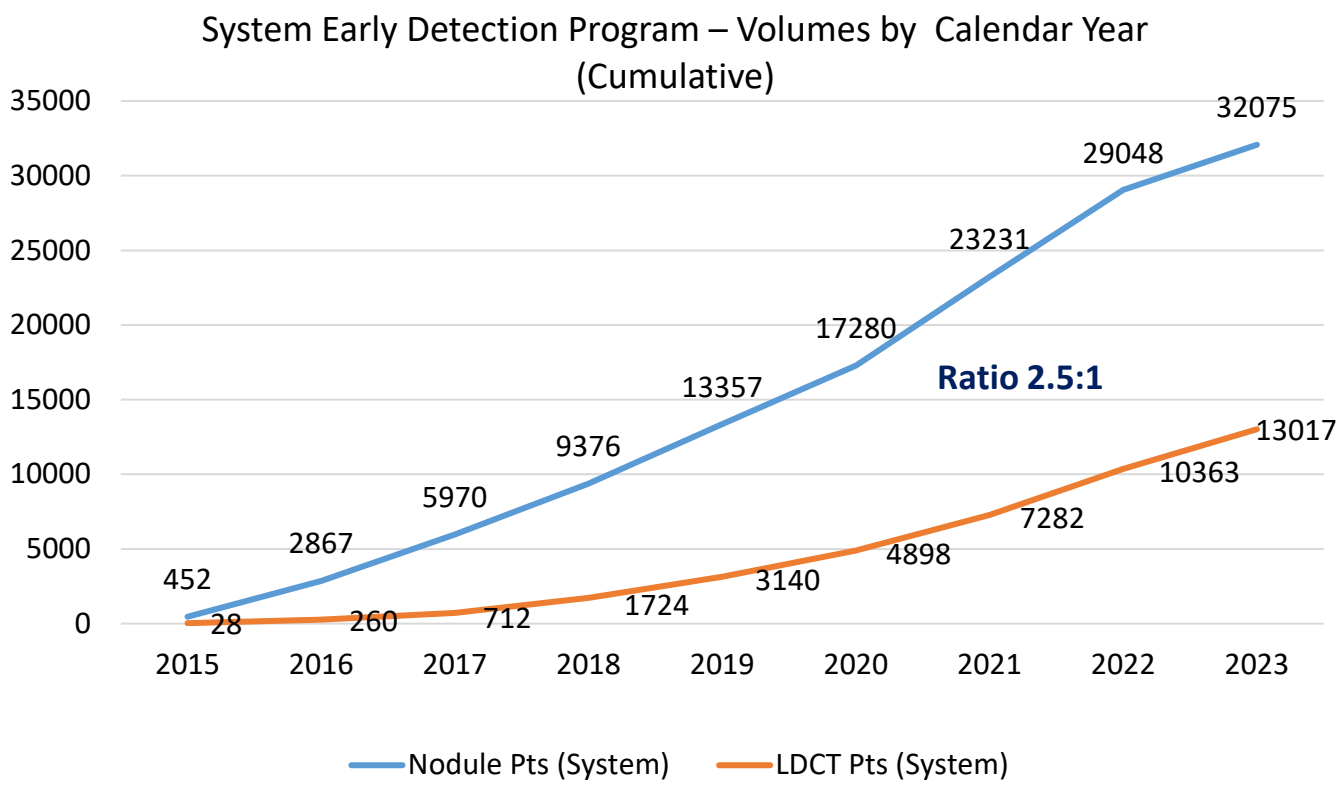
Guideline-Concordant Management of Incidentally Detected Lung Nodules[1,2]

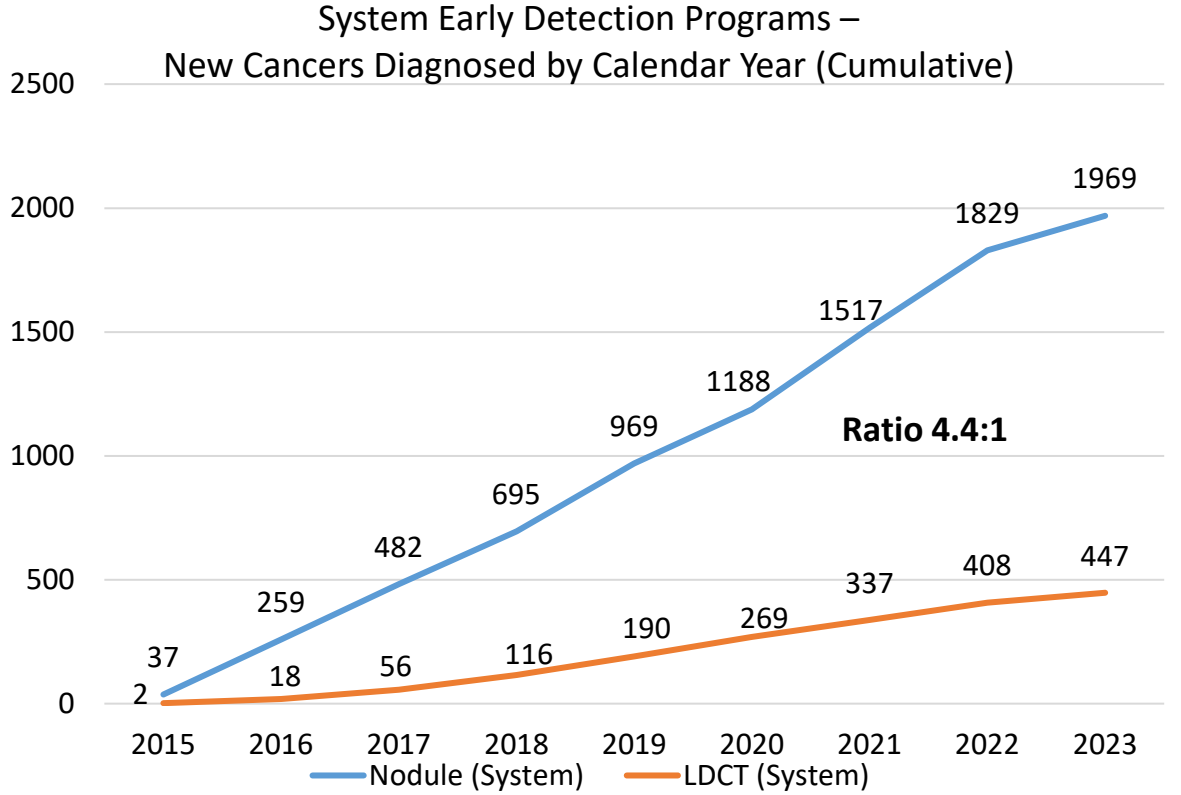
- Pros:
  - Starts from the point of detection of potentially malignant lung lesion
  - LDCT eligibility criteria less relevant
  - Bypasses LDCT implementation barriers
  - Leverages existing clinical material, infrastructure
  - Expands the reach of early detection to hard-to-reach populations
  - Alleviates a medico-legal quandry
- Cons:
  - Requires some infrastructure for identifying, tracking, oversight
  - Optimally requires transparent, interdisciplinary decision-making

[1]Gould MK, Donington J, Lynch WR, et al. ACCP evidence-based clinical practice guidelines. Chest. 2013 **PMID: 23649456,**
[2]MacMahon H, Naidich DP, Goo JM, et al. From the Fleischner Society 2017. Radiology. 2017 **PMID: 28240562.**

Detecting Early Lung Cancer (DELUGE) in MS Delta

Program Volumes





Annual Volumes	2015	2016	2017	2018	2019	2020	2021	2022	2023*
Nodule	452	2,415	2,985	3,406	3,981	3,923	5,951	5,817	3,562
LDCT	28	232	452	1,012	1,416	1,758	2,384	3,081	2,614

Cumulative Rates of Detection
Nodule – 6.14%
LDCT –3.43%

*Data through August 2023

ILNP: Complementary Pathway to Early Lung Cancer Detection?

Patient Group	LDCT	LNP	MDC	*P*
Proportion eligible for LDCT by USPSTF 2013 Criteria, No. (%)				
All patients	4,513 (79.75)	1,756 (11.36)	570 (32.28)	< .0001
Patients with lung cancer	133 (88.67)	298 (42.69)	430 (42.57)	< .0001
Proportion eligible for LDCT by USPSTF 2021 Criteria, No. (%)				
All patients	4,720 (83.41)	2,280 (14.75)	718 (40.66)	< .0001
Patients with lung cancer	137 (91.33)	344 (49.28)	529 (52.38)	< .0001

Abbreviations: LDCT, Low-Dose Computed Tomography Lung Cancer Screening Program; LNP, Lung Nodule Program; MDC, Multidisciplinary Care Program; USPSTF, US Preventive Services Task Force.

Even if 100% of eligible persons by USPSTF 2021 criteria had been enrolled into LDCT screening, ILNP would have detected 20% of all stage I/II patients in the entire cohort.

Osarogiagbon, et al. Epub J Clin Oncol.
PMID: 35258994 **DOI: 10.1200/JCO.21.02496**

original reports abstract

Lung Cancer Diagnosed Th Lung Nodule, and Neither Observational Study of th Cancer (DELUGE) in the M

Raymond U. Osarogiagbon, MBBS[1]; Wei Liao, PhD[1]; Nicholas R. Fa Jordan Lane, MA[1]; Sara C. Williams, MFA[1]; Anita A. Patel, MBBS[1]; Amanda Epperson, RN[1]; Joy Luttrell, RN[1]; Denise McCoy, BS[1]; Laur Keith Tonkin, MD[1,2]; Robert Optican, MD, MSHA[1,2]; Jeffrey Wright, Matthew P. Smeltzer, PhD[4]

PURPOSE Lung cancer screening saves lives, but implem to early lung cancer detection—low-dose computed management of incidentally detected lung nodules.

METHODS A prospective observational study enrolled pa compared them with patients managed in a Multidisc distribution, surgical resection rates, 3- and 5-year survi diagnosed with lung cancer.

RESULTS From 2015 to May 2021, 22,886 patients were 1,766 in Multidisciplinary Care. Of 150, 698, and 1,010 programs, 61%, 60%, and 44% were diagnosed at clinica IV (P = .0005); 47%, 42%, and 32% had curative-intent rates were 80% (95% CI, 73 to 88) versus 64% (60 to 6 were 76% (67 to 87) versus 60% (56 to 65) versus 44% (lung cancer would have been deemed eligible for LDCT criteria, and 54% by 2021 criteria. Even if all eligible pat LDCT, the Nodule Program would have detected 20%

CONCLUSION LDCT and Lung Nodule Programs are co detection and curative treatment to different-risk popul leviate emerging disparities in access to early lung can

J Clin Oncol 00. © 2022 by American Society of Clinical Oncology

INTRODUCTION

Although aggregate US lung cancer incidence and mortality statistics have improved in recent years, they mask great geographic heterogeneity.[1-3] States and counties in the Southeastern and Midwestern United States lag behind in the emerging improvement.[1,3] The aggregate 5-year lung cancer survival barely reaches 21%, largely because 79% of patients present with regional and distant metastatic disease, when the 5-year survival is 32% and 6%, respectively.[1] Only 15% present with localized disease when the 5-year survival is 59%.[1]

Low-dose computed tomographic screening for lung cancer (LDCT) saves lives.[4,5] Annual LDCT was recommended by the US Preventive Services Task Force

ASSOCIATED CONTENT
Appendix
Protocol
Author affiliations and support information (if applicable) appear at the end of this article.
Accepted on January 31, 2022 and published at ascopubs.org/journal/jco on March 8, 2022: DOI https://doi.org/10.1200/JCO.21.02496

ORIGINAL ARTICLE

Potential Impact of Criteria Modi and Sex Disparities in Eligibility f Screening

Matthew P. Smeltzer, PhD,[a] Wei Liao, PhD,[b] Nicho Carrie Fehnel, BBA,[b] Jordan Goss, MA,[b] Catherine Rodolfo Ramos, BA,[b] Talat Qureshi, BS,[b] Ayesha M Meredith A. Ray, PhD,[a] Raymond Uyiosa Osarogiag

[a]Division of Epidemiology, Biostatistics, and Environmental Healt Memphis, Tennessee
[b]Multidisciplinary Thoracic Oncology Department, Baptist Cancer

Received 18 August 2022; revised 20 September 2022; accepted 2 Available online - 5 October 2022

ABSTRACT

Introduction: Low-dose computed tomography (LDCT) screening reduces lung cancer mortality, but current eligibility criteria underestimate risk in women and racial minorities. We evaluated the impact of screening criteria modifications on LDCT eligibility and lung cancer detection.

Methods: Using data from a Lung Nodule Program, we compared persons eligible for LDCT by the following: U.S. Preventive Services Task Force (USPSTF) 2013 criteria (55–80 y, ≥30 pack-years of smoking, and ≤15 y since cessation); USPSTF2021 criteria (50–80 y, ≥20 pack-years of smoking, and ≤15 y since cessation); quit duration expanded to less than or equal to 25 years (USPSTF2021-QD25); reducing the pack-years of smoking to more than or equal to 10 years (USPSTF2021-PY10); and both (USPSTF2021-QD25-PY10). We compare across groups using the chi-square test or analysis of variance.

Results: The 17,421 individuals analyzed were of 56% female sex, 69% white, 28% black; 13% met USPSTF2013 criteria; 17% USPSTF2021; 18% USPSTF2021-QD25; 19% USPSTF2021-PY10; and 21% USPSTF2021-QD25-PY10. Additional eligible individuals by USPSTF2021 (n = 682) and USPSTF2021-QD25-PY10 (n = 1402) were 27% and 29% black, both significantly higher than USPSTF2013 (17%, $p <$ 0.0001). These additional eligible individuals were 55% (USPSTF2021) and 55% (USPSTF2021-QD25-PY10) of female sex, compared with 48% by USPSTF2013 ($p < 0.05$). Of 1243 persons (7.1%) with lung cancer, 22% were screening eligible by USPSTF13. USPSTF2021-QD25-PY10 increased the total number of persons with lung cancer by 37%. These additional individuals with lung cancer were of 57% female sex (versus 48% with USPSTF2013, $p = 0.0476$) and 24% black (versus 20% with USPSTF2013, $p = 0.3367$).

JAMA Network | Open

Original Investigation | Oncology

Evaluation of Lung Cancer Ri or Guideline-Concordant Mo

Raymond U. Osarogiagbon, MBBS; Wei Liao, PhD; Nicholas Anberitha T. Matthews, PhD; Matthew P. Smeltzer, PhD; Pa

Abstract

IMPORTANCE Guideline-concordant management diagnosis, but the lung cancer risk profile of persons from that of screening-eligible persons.

OBJECTIVE To compare lung cancer diagnosis haza computed tomography screening (LDCT cohort) an

DESIGN, SETTING, AND PARTICIPANTS This pros enrollees from January 1, 2015, to December 31, 202 system. Participants were prospectively identified, (survival was updated at 6-month intervals. The LDC Reporting and Data System as having no potentially those with potentially malignant lesions (Lung-RAD by smoking history into screening-eligible vs screen cancer, younger than 50 years or older than 80 year cohort only) were excluded. Participants were follo

MAIN OUTCOMES AND MEASURES Comparative patient, nodule, and lung cancer characteristics bet

RESULTS There were 6684 participants in the LDC men [50.49%]; 5774 [86.39%] in the Lung-RADS 1-2 and 12 645 in the LNP cohort (mean [SD] age, 65.42 [19.75%] screening eligible and 10 148 [80.25%] scr 1244 (18.61%) of the LDCT cohort, 492 (19.70%) of (28.72%) of the screening-ineligible LNP cohort ($P <$ mm for the LDCT cohort (3 [IQR, 2-4] mm for Lung-R cohorts), 9 (IQR, 6-16) mm for the screening-eligible screening-ineligible LNP cohort. In the LDCT cohort (1.44%) in the Lung-RADS 1-2 cohort and 162 (17.80 cohort, it was diagnosed in 531 (21.27%) in the scree screening-ineligible cohort. Compared with Lung-R were 16.2 (95% CI, 12.7-20.6) for the screening-eligi screening-ineligible cohort; compared with Lung-RA 0.3 (95% CI, 0.2-0.4), respectively. The stage of lun (64.46%) in the LDCT cohort, 276 of 531 (52.00%) 447 (56.60%) in the screening-ineligible LNP cohor

JAMA Network Open. 2023;6(2):e2307167. doi:10.1001/jamanet

Pulmonary Nod Screening, and Medicare Popul

Paul Pinsky, PhD; Eric Miller, PhD;

BACKGROU may reduc

RESEARCH lung cance diagnosed

STUDY DES gram-Med of Medicar with a dia month pe nying cod R91.1 (ICI classified b diagnosis cancer stag

RESULTS: of 5.0 year nosis were 2.9%, and in the PN, disease of a the PN an rates were

INTERPRET PNs tende had PNs t LDCT scar lung cance

KEY WORDS

ABBREVIATIONS: HMO = health mainter hazard ratio; ICD = International Classifica low-dose CT; PN = pulmonary nodule; SE miology and End Results

AFFILIATIONS: From the Division of Cance M.), National Cancer Institute, Bethesda, MD

Received: 27 February 2023 | Revised: 11 April 2023 | Accepted: 24 April 2023
DOI: 10.1002/cncr.34846

ORIGINAL ARTICLE

Diagnostic follow-up of indeterminate pulmonary nodules in the Medicare population

Paul F. Pinsky PhD[1] | Raymond Osarogiagbon MD[2]

[1]Division of Cancer Prevention, National Cancer Institute, National Institutes of Health, Bethesda, Maryland, USA
[2]Multidisciplinary Thoracic Oncology Program, Baptist Cancer Center, Memphis, Tennessee, USA

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Abstract

Background: Management of indeterminate pulmonary nodules (IPNs) is associated with redistribution of lung cancer to earlier stages, but most subjects with IPNs do not have lung cancer. The burden of IPN management in Medicare recipients was assessed.

Methods: Surveillance, Epidemiology, and End Results–Medicare data were analyzed for IPNs, diagnostic procedures, and lung cancer status. IPNs were defined as chest computed tomography (CT) scans with accompanying *International Classification of Diseases* (*ICD*) codes of 793.11 (*ICD-9*) or R91.1 (*ICD-10*). Two cohorts were defined: persons with IPNs during 2014–2017 comprised the IPN cohort, whereas those with chest CT scans without IPNs during 2014–2017 comprised the control cohort. Excess rates of various procedures due to reported IPNs over 2 years of follow-up (chest CT, positron emission tomography [PET]/PET-CT, bronchoscopy, needle biopsy, and surgical procedures) were estimated using multivariable Poisson regression models comparing the cohorts adjusted for covariates. Prior data on stage redistribution associated with IPN management were then used to define a metric of excess procedures per late-stage case avoided.

Results: Totals of 19,009 and 60,985 subjects were included in the IPN and control cohorts, respectively; 3.6% and 0.8% had lung cancer during follow-up. Excess procedures per 100 persons with IPNs over a 2-year follow-up were 63, 8.2, 1.4, 1.9, and 0.9 for chest CT, PET/PET-CT, bronchoscopy, needle biopsy, and surgery, respectively. Corresponding excess procedures per late-stage case avoided were 48, 6.3, 1.1, 1.5, and 0.7 based on an estimated 1.3 late-stage cases avoided per 100 IPN cohort subjects.

Conclusions: The metric of excess procedures per late-stage case avoided can be used to measure the benefits-to-harms tradeoff of IPN management.

KEYWORDS
diagnostic imaging, lung neoplasms, Medicare, pulmonary nodule, surgical procedures

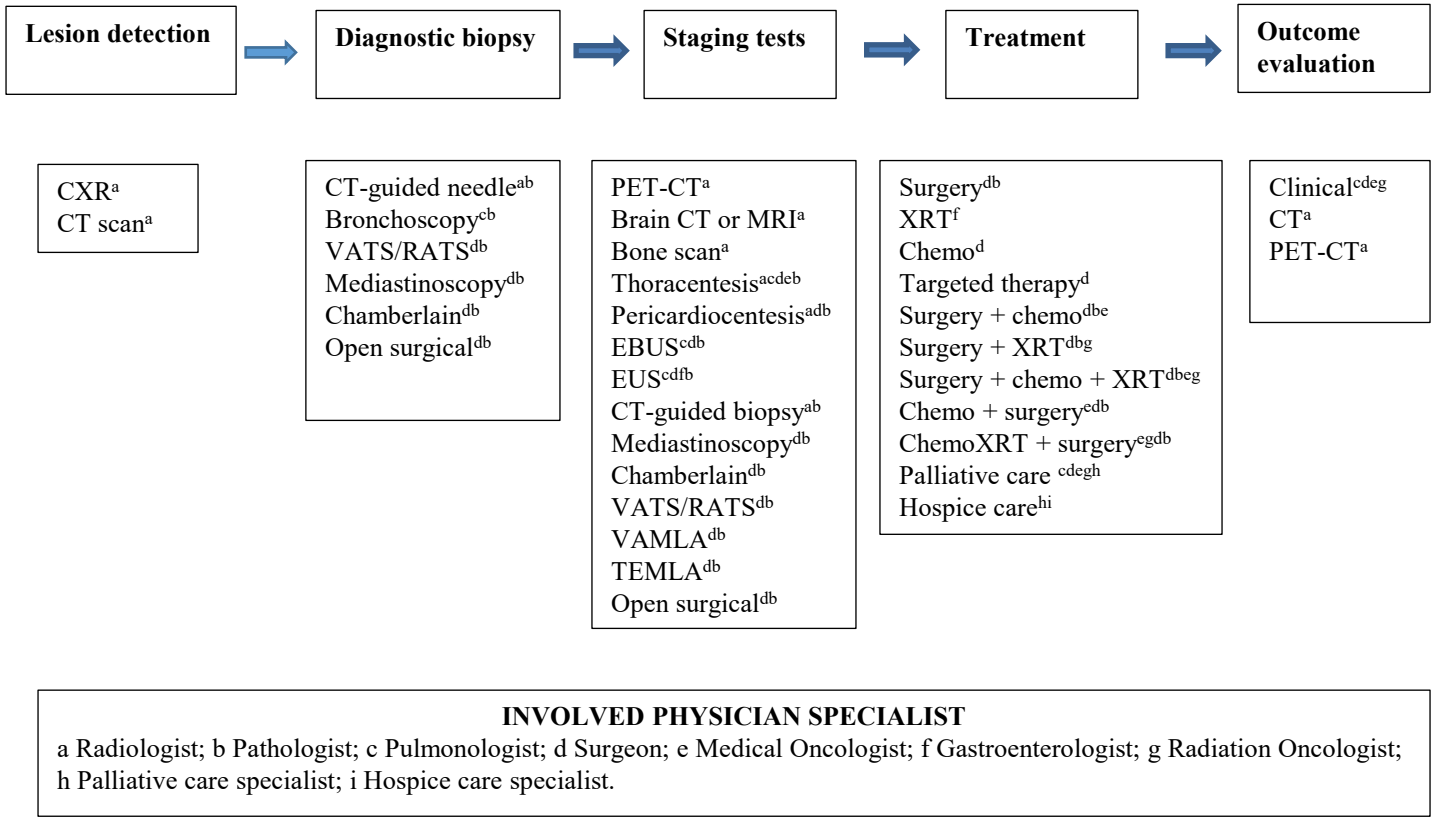
Osarogiagbon RU. 'The Mid-South Miracle.' Fred Hutch Cancer Center Value in Cancer Care Summit 2023. November 2, 2023.

Structured Multidisciplinary Decision-Making

Osarogiagbon RU. 'The Mid-South Miracle.' Fred Hutch Cancer Center Value in Cancer Care Summit 2023. November 2, 2023.

Lung Cancer Care is Complex!

- Anatomy
- Patient characteristics
- Widening array of options
- Provider factors
- Care-delivery systems



Osarogiagbon RU. Achieving better quality of lung cancer care. In: Tanoue L, Detterbeck F, editors. *Lung Cancer: A Practical Approach to Evidence-Based Clinical Evaluation and Management*. St. Louis, MO: Elsevier; 2018:167-182.

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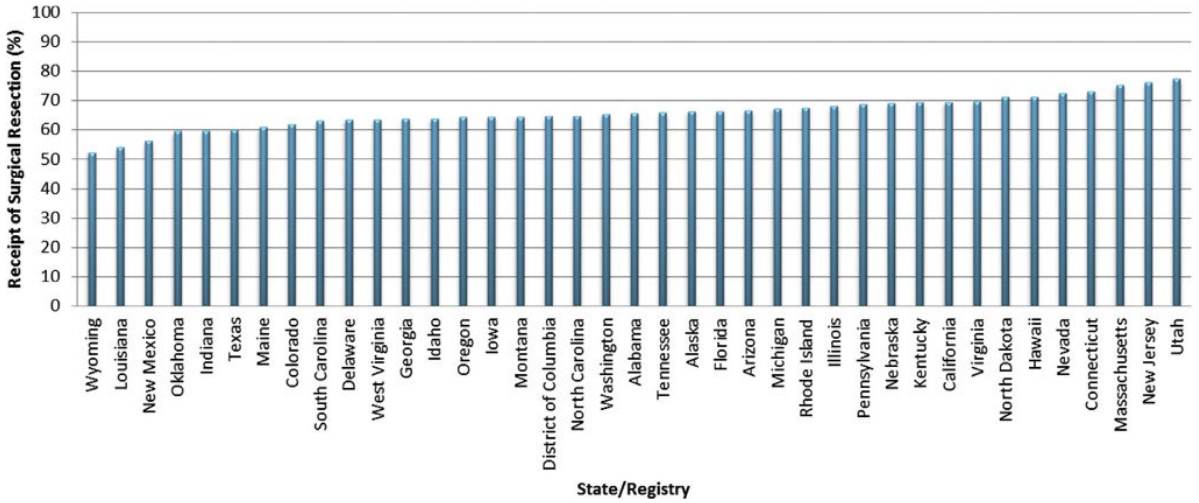
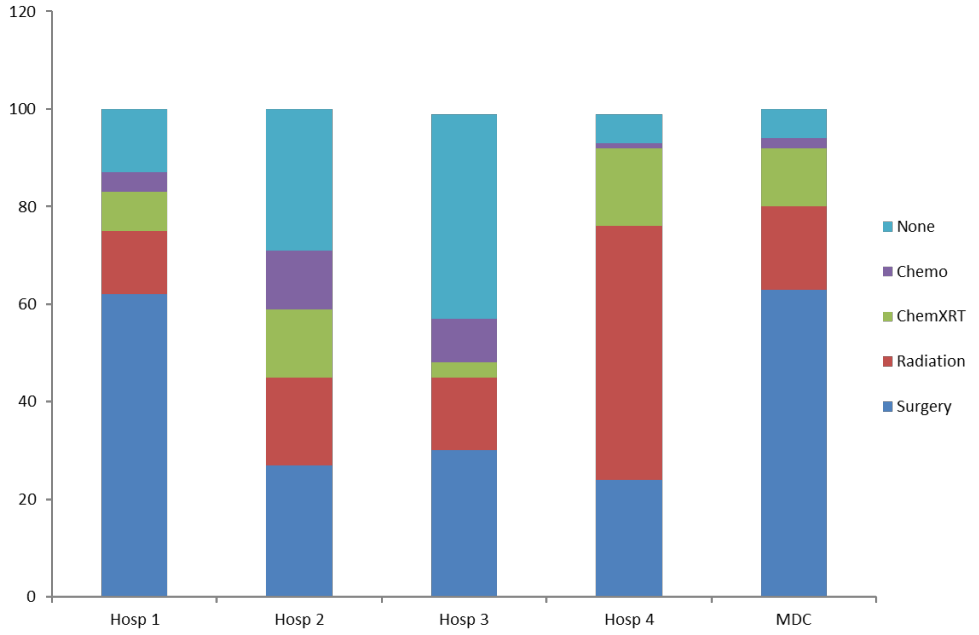
NATIONAL CANCER POLICY FORUM

Problem: Guideline-Discordant Treatment



Sineshaw, Wu, Flanders, Osarogiagbon, Jemal. J Thorac Oncol 2016



Treatment of Stage I/II NSCLC- Single Healthcare System. Osarogiagbon, Unpublished

County-level range: 12.8% to 91.7%!

Sineshaw, Sahar, Osarogiagbon, Flanders, Yabroff, Jemal. Chest. 2020;157:212-222.

What is ‘Multidisciplinary Care’?

- A title/brand/marketing opportunity?
- A program?
- Care by a group of individuals?
- A set of benchmarks or standards?
- A set of behaviors?
- A set of beliefs? A way of thinking? Conceptual model built around principles of care?

Stakeholder Perspectives: Multidisciplinary Model

	Patients & Caregivers	Physicians	Hospital Admins.	Health Insurance
Benefits				
Physician collaboration	+	+	+	+
Coordinated care	+	+	+	+
Concordance with recommendations	+	+	+	+
Timeliness of care	+	+	+	+
Challenges				
Financial disincentives		+		
Scheduling conflicts		+		
Conflicting treatment opinions		+		
Lack of validated benchmarks			+	+

Multidisciplinary Care: A Definition

- Delivered by a **coordinated team** committed to **processes** that enhance certain group behaviors demonstrated to be necessary for high quality **outcomes**.

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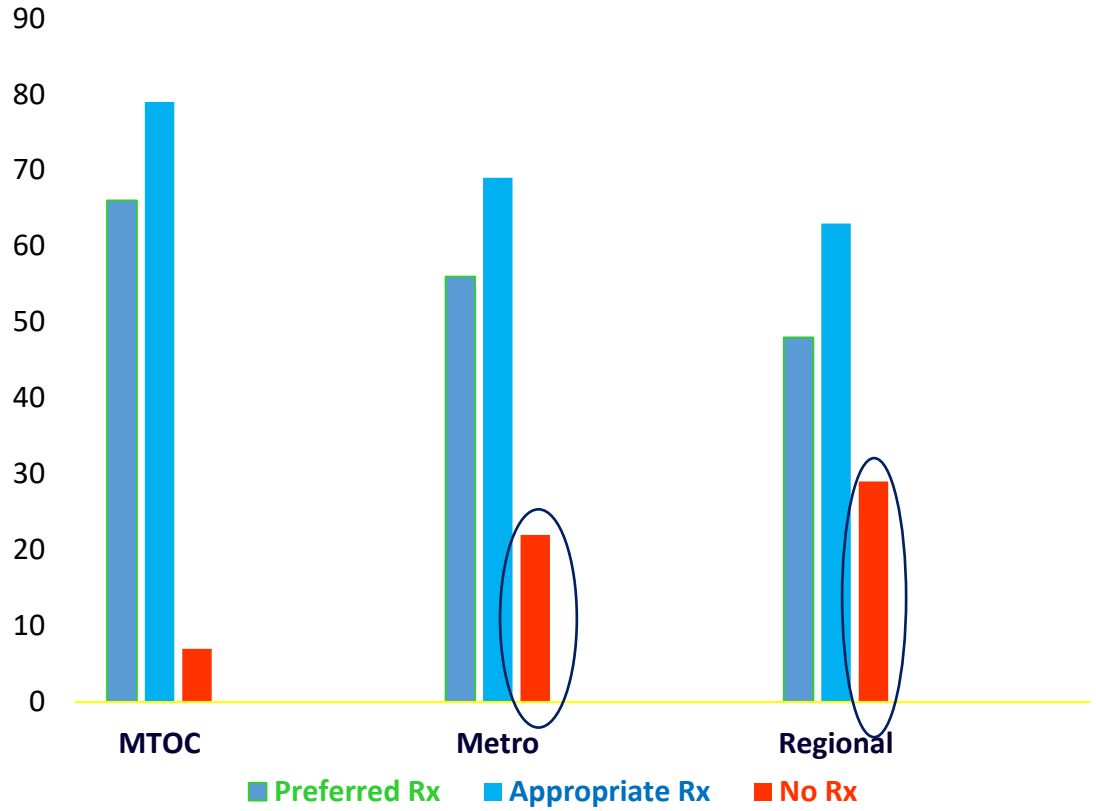
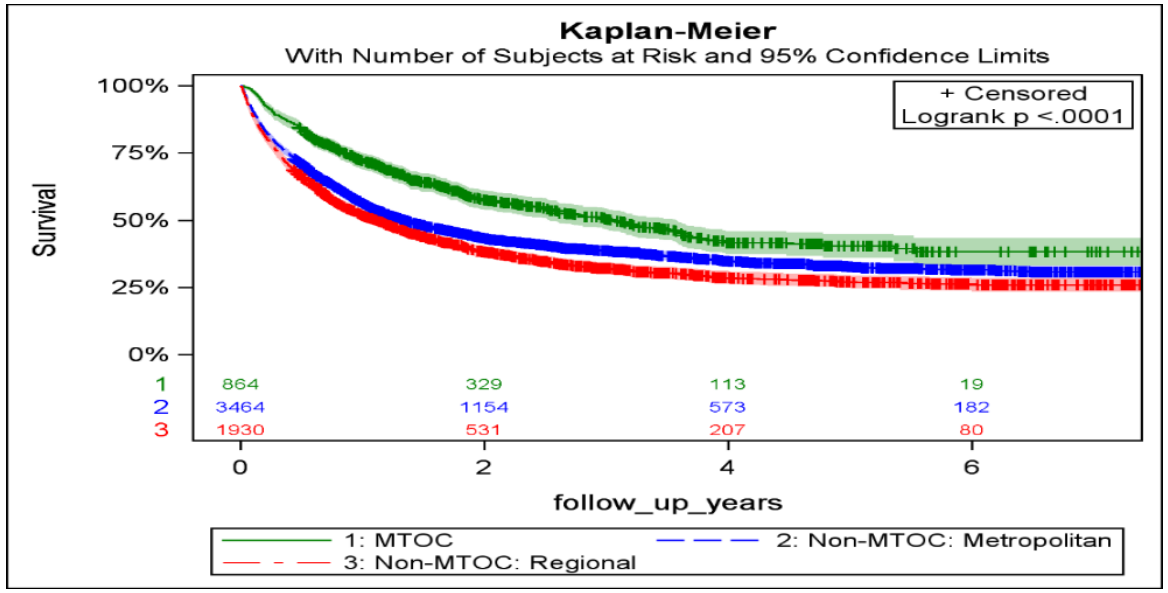
MultiD Care Saves Lives

‘Building a multidisciplinary bridge across the quality chasm of thoracic oncology…’

Baptist Memorial Healthcare Corporation NSCLC patients 2011-2017





Ray MA, et al. JTO Clin Res Rep 2021. PMID: 34590046

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The Immutable Core of Multidisciplinary Care

- A coordinated team…

- Team
  - Anatomy
    - All physician specialties/skill sets (diagnosticians, tissue procurers, treatment specialists)
    - Central coordination through navigators
    - Must include the patient and their caregivers
  - Physiology
    1. Recognition of the team by members and non-members
    2. Commitment to mutually agreed team-level objectives
    3. Interdependent functionality toward team objectives
    4. Regular **reflection** to regulate and adapt team objectives and processes

Team Science Principles

- 1. Shared mental models
  - What do we seek to achieve?
  - How do we achieve it?
  - How can we tell where we are in getting from here to there (benchmarking)?
- 2. Mutual trust
- 3. Mutual performance monitoring
  - Evidence-based care
  - Concordance between recommendations and care delivery
  - Quality and safety of care

Continuous data collection, analysis and interpretation
CORE PRINCIPLE!

- 4. Backup behavior
  - Program success independent of single individuals' availability: 'the show goes on.'
- 5. Psychological safety
  - Team members empowered to speak up.
- 6. Closed-loop communication
  - Content, structure and reliability of message.

Applied Team Science: Multidisciplinary Team-Based Care

Team Principles	Team Behaviors	Team Benchmarks	Team Targets
Shared Mental Models Mutual Trust Mutual Performance Monitoring Backup Behavior Psychological Safety Closed-Loop Communication	Commitment to pre-agreed conference and meeting logistics	- Attendance at regular conference - Attendance at monthly program meeting(s)	- Team members are present at all team meetings - At least one of each specialty present at all conferences (med onc, rad onc, surgery, pulm, pathology, radiology, navigation) - All conference cases are presented by the referring provider or their pre-specified delegate
	Systematic, prospectively coordinated case selection: eg. all new cases	- % of cases presentations that are prospective - % of institutional cases presented at conference	- 100% prospective presentations - 50% in Y1, 70% in Y2, 90% all subsequent years
	Commitment to standard, evidence-based care (evaluation and treatment) pathways Consideration of all relevant clinical information/perspectives Multi-level incorporation of patient/caregiver perspectives	- Concordance between consensus recommendations and care delivered - Guideline concordant staging practice - Stage-appropriate treatment rate	- 80% concordance rate - All discordant care documented with reason(s) why - 80% guideline concordant staging practice - 80% stage appropriate treatment rate
	Team meeting results in precise, strategic, evidence-based consensus plan. The consensus plan is documented, quickly and verifiably communicated to all team members	- % of patients with a conference note completed - % of conference notes routed to entire care team - % of case presentations for which stage is articulated and documented - Verifiable/timely communication of recommendations	- 100% of presentations have a conference note completed, including attributed stage and detailed recommendations with justifications - 100% of conference notes are routed to care team within 48 hours

Red Bar Challenge: BMHCC 2015 - 2021

Figure 4A. K-M plot in whole cohort (2011-2021): Stratified by program pathway

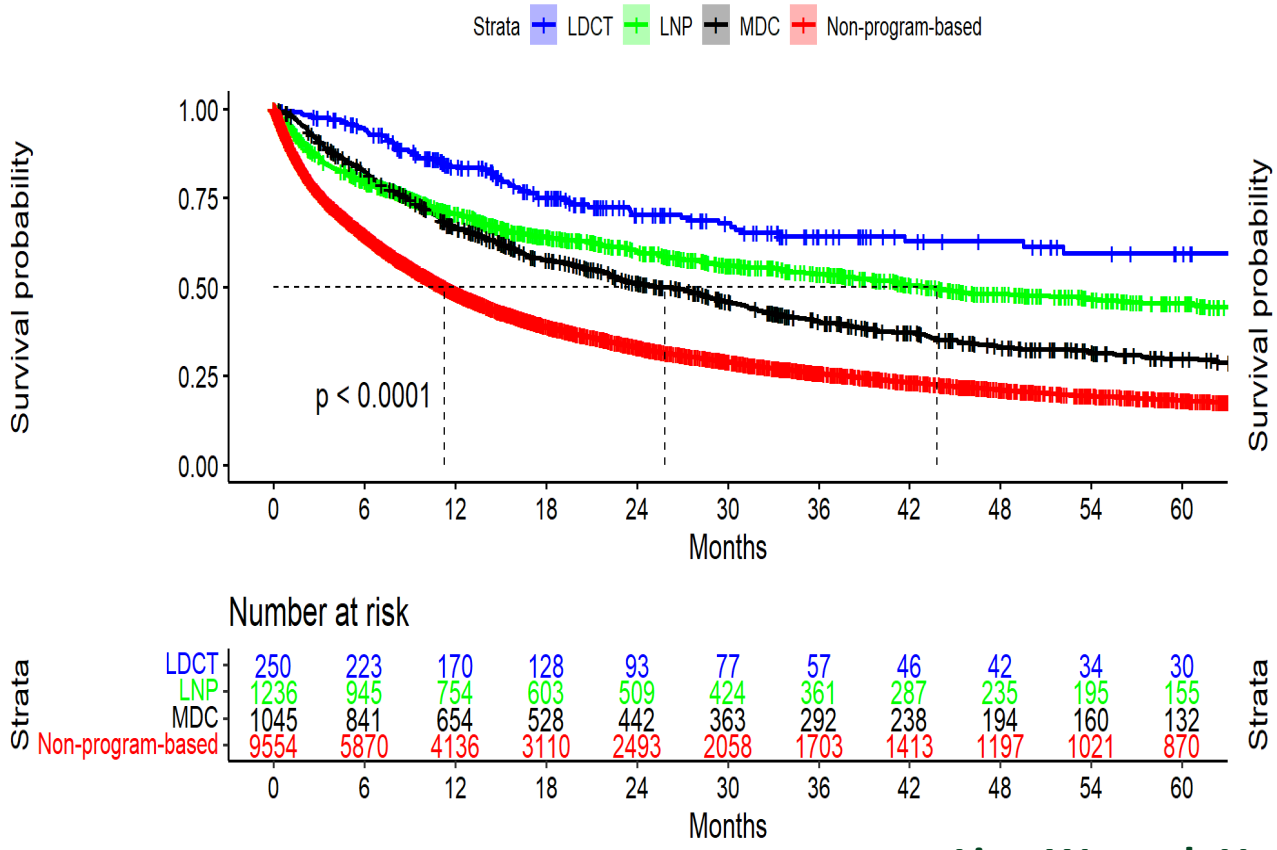
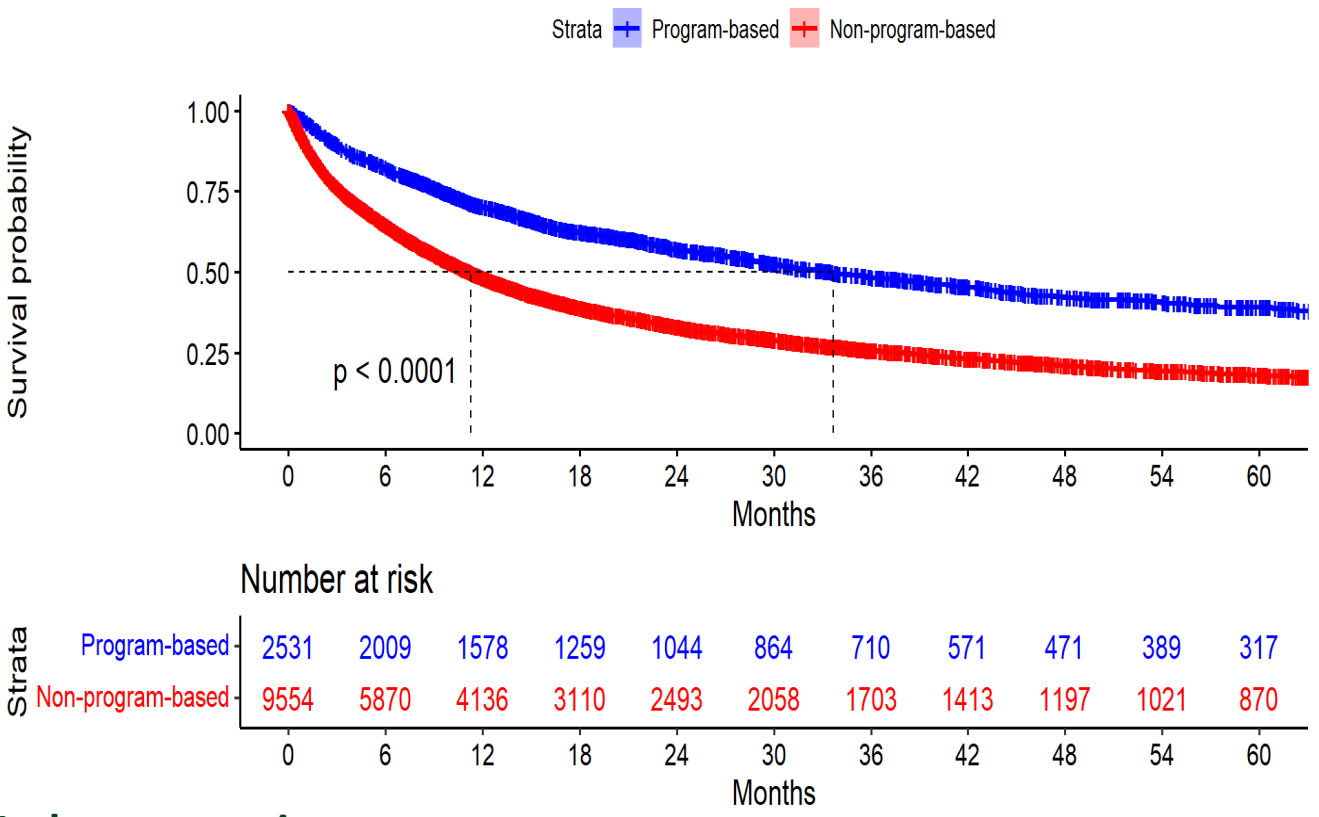


Figure 4B. K-M plot in whole cohort (2011-2021):
Program-based care cohort combined vs. Non-program-based care cohort



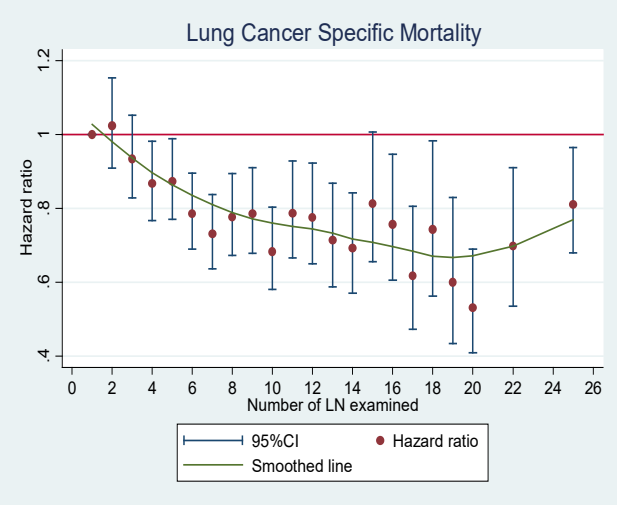
Liao W, et al. Under peer review

Surgical Quality Improvement: The Mid-South Quality of Surgical Resection (MS-QSR) Project

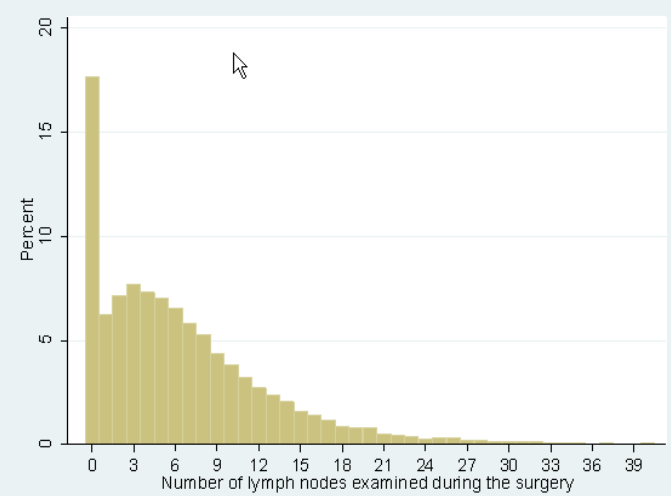
Osarogiagbon RU. 'The Mid-South Miracle.' Fred Hutch Cancer Center Value in Cancer Care Summit 2023. November 2, 2023.

The Problem: Poor Surgical Quality Begets Poor Outcomes

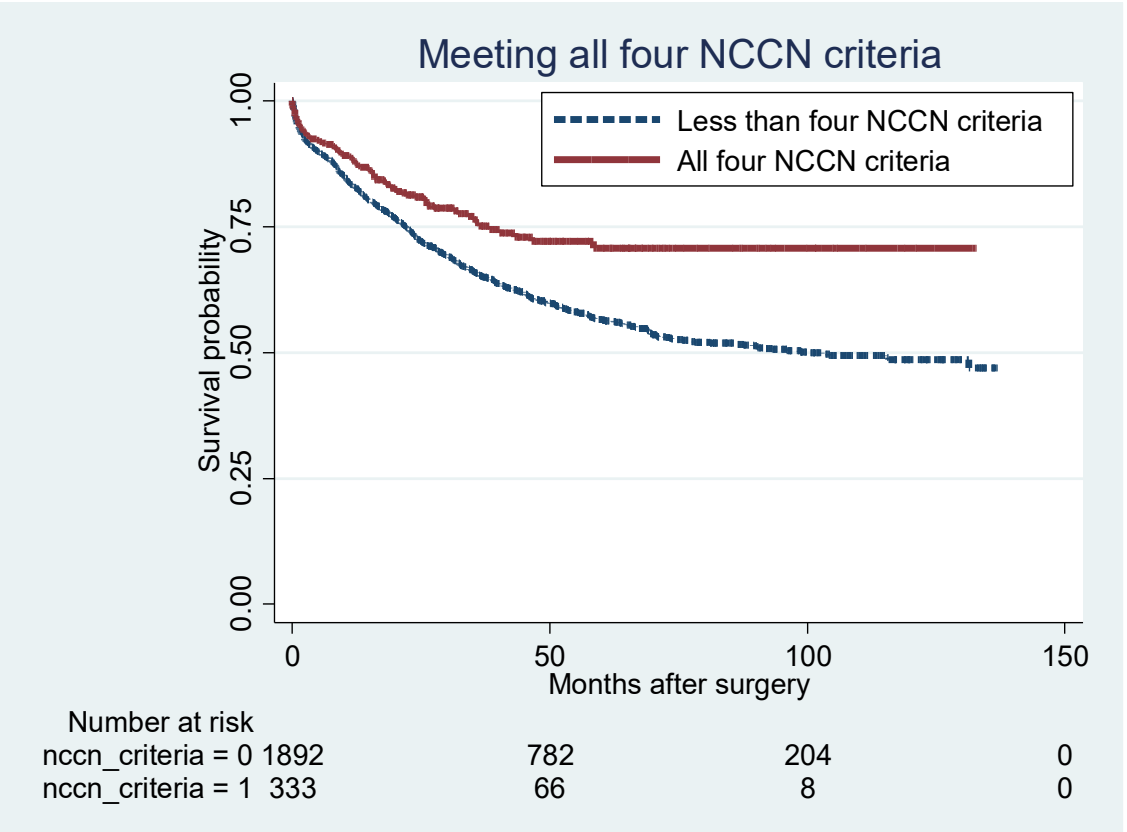
The main component of the problem: poor pathologic nodal evaluation



Osarogiagbon RU, et al. Ann Thorac Surg. 2014
PMID: 24266949

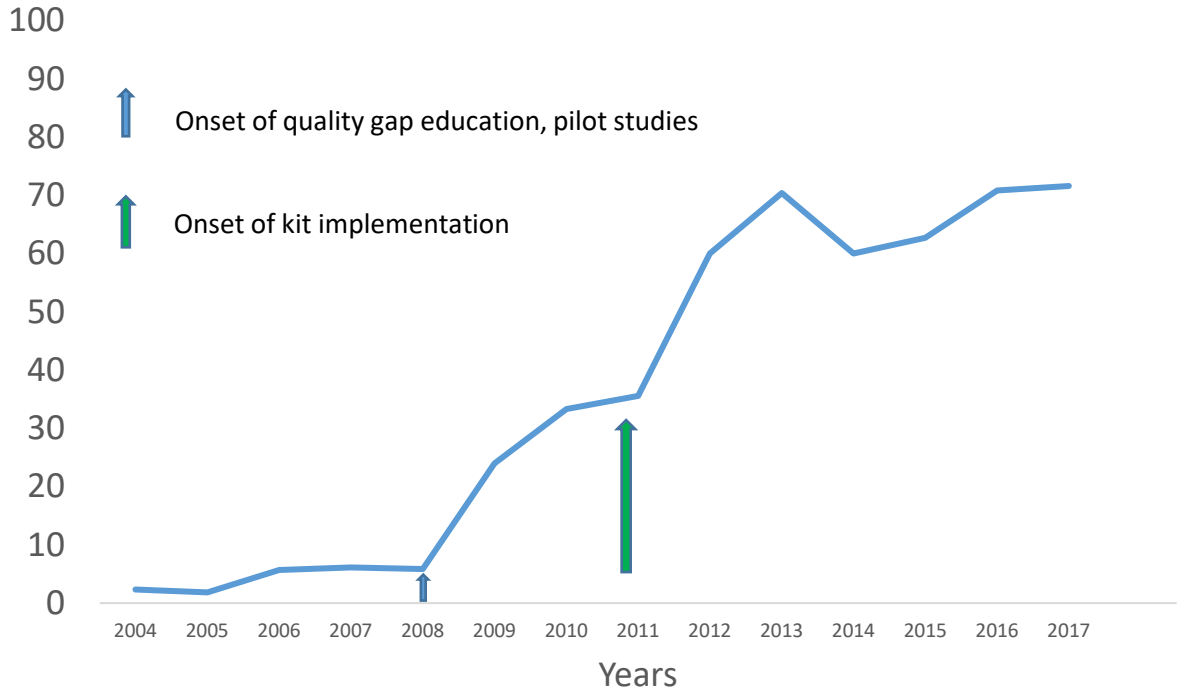


Osarogiagbon RU, et al Ann Thorac Surg. 2016
PMID: 27262908

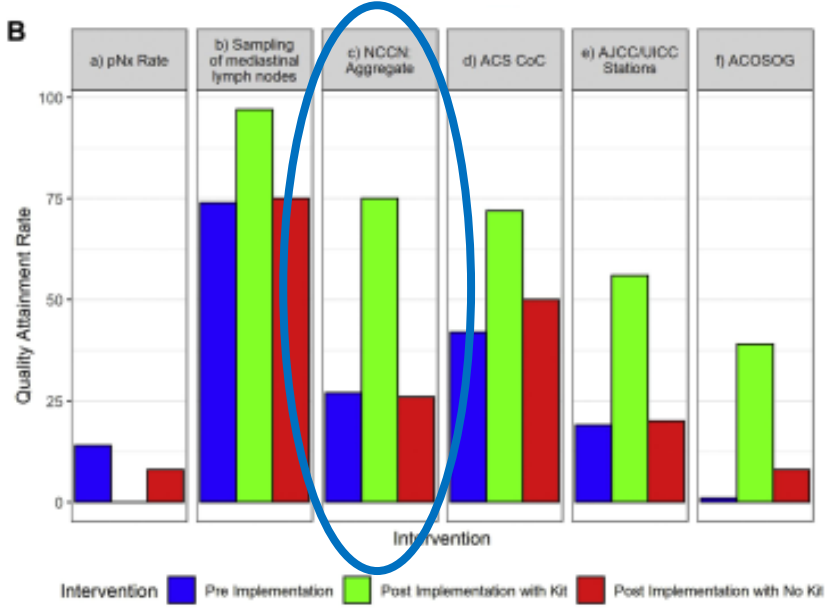


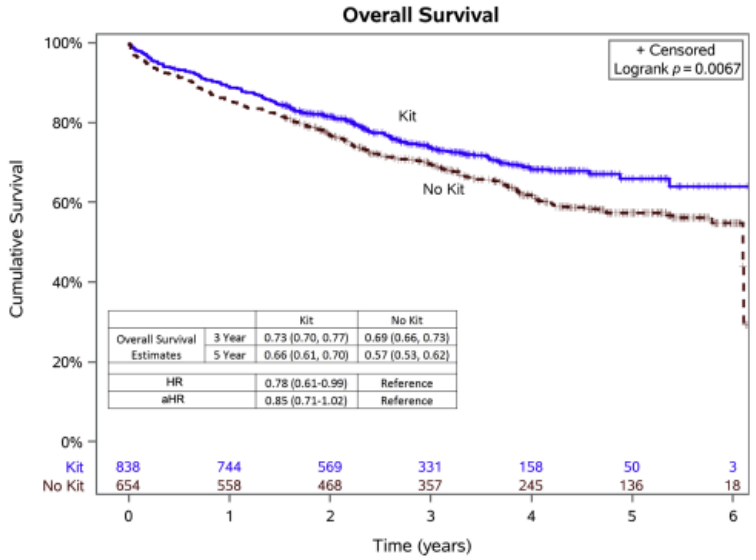
Osarogiagbon RU, et al. Ann Thorac Surg. 2017
PMID: 28366464

Attainment of National Comprehensive Cancer Network (NCCN) Surgical Quality Benchmark*



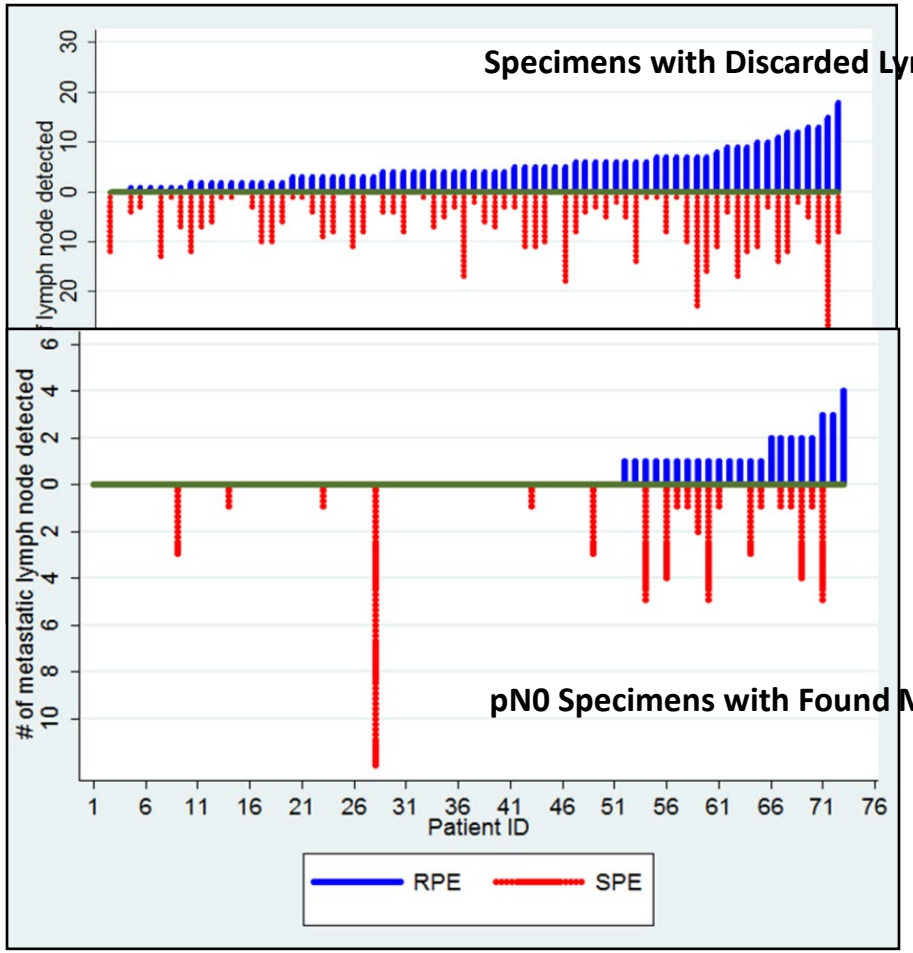
*NCCN: Anatomic resection + negative margins + hilar/intrapulmonary node sampling + ≥ 3 mediastinal nodal station sampling





Osarogiagbon et al. J Thorac Oncol. 2021. PMCID: PMC8012255.

Takes Two to Tango: Pathology Interventions



- Discarded lymph nodes were found in 90% of lobectomy specimens
- 60% of intrapulmonary lymph nodes were discarded without examination
- 29% of discarded lymph nodes had metastasis, including 12% of pN0 specimens

Ramirez RA, et al, JCO 2012;30(23):2823-2828. PMID: 22778318.

ORIGINAL ARTICLE

Outcomes After Use Kit for Lung Cancer Population-Based, M Implementation Stu

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Phillip Ojeabulu, M.B.B.S.,[a] O
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Available online - 16 February 2021

ABSTRACT

Introduction: Suboptimal patholog prevails after curative-intent resecti We evaluated the impact of a lym collection kit on lung cancer surg prospective, population-based, stag tion study.

Methods: From January 1, 2014, to A implemented the kit in three homog cohorts involving 11 eligible hospitals f hospital referral regions. Our primary logic nodal staging quality, defined evidence-based measures: the number stations examined, proportions with p such as nonexamination of lymph n quality benchmarks including the Nati Cancer Network criteria. Additional perioperative complications, health c overall survival.

Results: Of 1492 participants, 56% ha kit and 44% without. Pathologic nodal significantly higher in the kit cases: 0.2

Surgeon Quality and Patient S Non–Small-Cell Lung Cancer

Meredith A. Ray, PhD[1]; Olawale Akinbobola, MPH[2]; Carrie Fehnel, BB
Ganpat Valaulikar, MD[4]; Hetal D. Patel, MD[5]; Thomas Ng, MD[6]; Todd Rol
and Raymond U. Osarogiagbon, MBBS, FACP[2,8]; The Mid-South Quali

DOI https://doi.org/10.1200/JCO.22.01971

ABSTRACT

PURPOSE The quality and outcomes of curative-intent populations. Surgeons are key drivers of surg association between surgeon-level intermediat survival differences, and potential mitigation b

PATIENTS AND METHODS Using a baseline population-based surgical surgeon-level cut points for rates of positiv lymph nodes, nonexamination of mediastinal sections. Applying the baseline cut points to a su population-based data set, we assign surgeon gories in reference to each metric: 1 (<25th pe tile), and 3 (>75th percentile). The sum of pe surgeon quality tiers: 1 (4–6, low), 2 (7–9, intern used chi-squared, Wilcoxon-Mann-Whitney, compare patient characteristics between the b and across surgeon tiers. We applied Cox prop amine the association between patient survival sequentially adjusting for clinical stage, patien cific processes.

RESULTS From 2009 to 2021, 39 surgeons performed 4,08 and subsequent cohorts. Among 31 subsequent c five were tier 2, and 21 were tier 3. Tier 1 and 2 s outcomes than tier 3 surgeons (hazard ratio [HI 1.19; 95% CI, 1.00 to 1.43, respectively). Adju mitigated the surgeon-tiered survival differen (95% CI, 0.8 to 1.3) and 0.93 (95% CI, 0.7 to 1.

CONCLUSION Readily accessible intermediate outcomes metr geon performance for targeted process impr patient survival disparities.

INTRODUCTION

Although improving in recent years, the aggregate 5-year survival of all patients diagnosed with lung cancer in the United States is still only approximately 23%.[1] Most 5-year survivors have had curative-intent surgery for non–small-cell lung cancer (NSCLC). However, fewer than 50% of recipients of surgical resection survive 5 years.[2,3] In CALGB/Alliance 140503, patients with stage IA NSCLC had a 5-year disease-free survival of 64% and two thirds of deaths were attributed to lung cancer.[4] Long-term survival disparities after curative-intent resection of NSCLC are well-described at the patient and institution levels.[5–8] Older

ORIGINAL ARTICLE

Institution-Level Evolution of Lung Can Resection Quality With Implementation Node Specimen Collection Kit

Olawale Akinbobola, MPH,[a] Meredith A. Ray, PhD,[b] Carrie
Andrea Saulsberry, MBA,[a] Kourtney Dortch, BS,[a] Matthew S
Nicholas R. Faris, M. Div,[a,c] Raymond U. Osarogiagbon, M.D[5]

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Received 22 August 2022; revised 25 January 2023; accepted 6 March 2023
Available online - 15 March 2023

ABSTRACT

Introduction: Lung cancer surgery with a lymph node kit improves patient-level outcomes, but institution-level impact is unproven.

Methods: Using an institutional stepped-wedge implementation study design, we compared lung cancer resection quality between institutions in preimplementation and postimplementation phases of kit deployment and, within implementing institutions, resections without versus with the kit. Benchmarks included rates of nonexamination of lymph nodes, nonexamination of mediastinal lymph nodes, and attainment of American College of Surgeons Operative Standard 5.8. We report institution-level adjusted ORs (aORs) for attaining quality benchmarks.

Results: From 2009 to 2020, three preimplementing hospitals had 953 resections; 11 implementing hospitals had 4013 resections, 58% without and 42% with the kit. Quality was better in implementing institutions and with kit cases. Compared with preimplementing institutions, the aOR for nonexamination of lymph nodes was 0.62 (0.49–0.8, $p = 0.002$), nonexamination of mediastinal lymph nodes was 0.56 (0.47–0.68, $p < 0.0001$), and attainment of Operative Standard 5.8 was 7.3 (5.6–9.4, $p < 0.0001$); aORs for kit cases were 0.01 (0.001–0.06), 0.08 (0.06–0.11), and 11.6 (9.9–13.7), respectively ($p < 0.0001$ for all). Surgical quality was persistently poor in preimplementing institutions but sequentially improved in implementing institutions in parallel with kit adoption. In implementing institutions, resections with the kit had a uniformly high level of quality, whereas nonkit cases had a low level of quality, approximating that of preimplementing institutions. Within implementing institutions, 5-year overall survival was 61% versus 51% after surgery with versus without the kit ($p < 0.001$).

Conclusions: tion kit improv lung cancer re

Keywords: Lun collection; Pati

Introducti

The qualit long-term sur cancer.[1] Awar sequences of p analyses of la data sets, ha

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Disclosure: Dr. specimen collect[31] Eli Lilly; serving Society, the Ass Roche, Biodesix Tryptych Healt founder of Onc consultant for remaining autho

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Lung: Research

Two Interventions on Pathologic Nodal Staging in a Population-Based Lung Cancer Resection Cohort

Raymond U. Osarogiagbon, MBBS,[1] Meredith A. Ray, PhD,[2] Carrie Fehnel, BBA,[1] Olawale Akinbobola, MPH,[1] Andrea Saulsberry, MBA,[1] Kourtney Dortch, BS,[1] Nicholas R. Faris, MDiv,[1] Anberitha T. Matthews, PhD,[1] Matthew P. Smeltzer, PhD,[2] and David Spencer, MD,[3] on behalf of the MS-QSR Consortium*

ABSTRACT

BACKGROUND Despite its prognostic importance, poor pathologic nodal staging of lung cancer prevails. We evaluated the impact of 2 interventions to improve pathologic nodal staging.

METHODS We implemented a lymph node specimen collection kit to improve intraoperative lymph node collection (surgical intervention) and a novel gross dissection method for intrapulmonary node retrieval (pathology intervention) in nonrandomized stepped-wedge fashion, involving 12 hospitals and ~~7~~ pathology groups. We used standard statistical methods to compare surgical quality and survival of patients who had neither intervention (group 1), pathology intervention only (group 2), surgical intervention only (group 3), and both interventions (group 4).

RESULTS Of 4019 patients from 2009 to 2021, 50%, 5%, 21%, and 24%, respectively, were in groups 1 to 4. Rates of nonexamination of lymph nodes were 11%, 9%, 0%, and 0% and rates of nonexamination of mediastinal lymph nodes were 29%, 35%, 2%, and 2%, respectively, in groups 1 to 4 ($P < .0001$). Rates of attainment of American College of Surgeons Operative Standard 5.8 were ~~19%, 22%, 70%, and 83%;~~ and rates of International Association for the Study of Lung Cancer complete resection were 14%, 21%, 53%, and 61% ($P < .0001$).
Compared with group 1, adjusted hazard ratios for death were as follows: group 2, 0.93 (95% CI, 0.76-1.15); group 3, 0.91 (0.78-1.03); and group 4, 0.75 (0.64-0.87). Compared with group 2, group 4 adjusted hazard ratio was 0.72 (0.57-0.91); compared with group 3, it was 0.83 (0.69-0.99). These relationships remained after exclusion of wedge resections.

CONCLUSIONS Combining a lymph node collection kit with a novel gross dissection method significantly improved pathologic nodal evaluation and survival.

(Ann Thorac Surg 2023;■:■-■)

For patients who undergo curative-intent surgery for non-small cell lung cancer, the pathologic nodal stage is a major determinant of subsequent management and prognosis.[1-3] Lymph node involvement connotes a worse prognosis and eligibility for adjuvant therapy.[2-5] Accurate pathologic nodal staging is increasingly important as more effective adjuvant therapy options become available. It depends on the combination of retrieval of hilar, mediastinal, and intrapulmonary nodes; thorough examination of all specimens; and complete, accurate reporting of the final pathologic findings.[6]

Deficits in these processes have been widely reported, with adverse impact on patient survival. For example,

The Supplemental Material can be viewed in the online version of this article [https://doi.org/10.1016/j.athoracsur.2023.08.026] on http://www.annalsthoracicsurgery.org.

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*Members of the MS-QSR Consortium are listed at the end of this article.

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Building clinical trials infrastructure in research deserts…

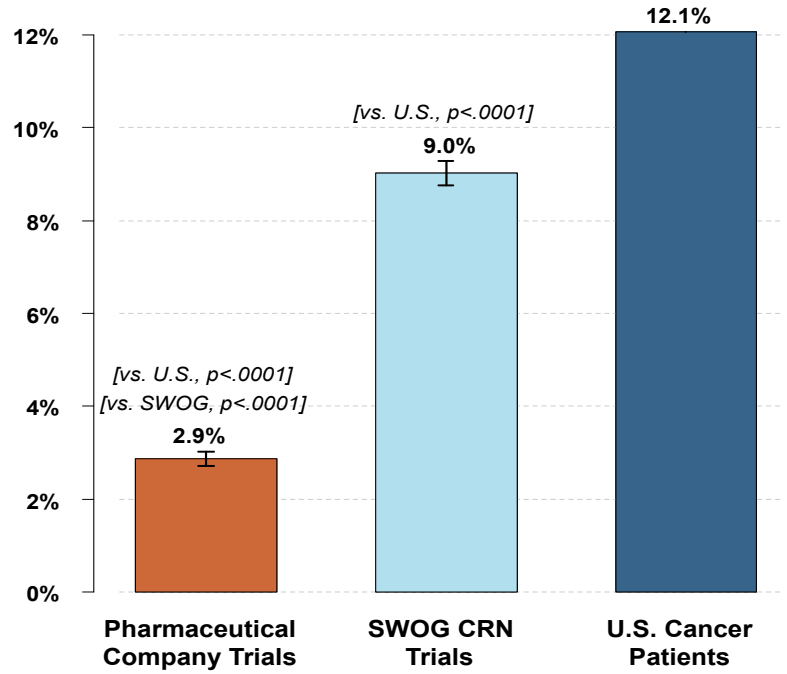
Osarogiagbon RU. 'The Mid-South Miracle.' Fred Hutch Cancer Center Value in Cancer Care Summit 2023. November 2, 2023.

Clinical Trials Matter Because….

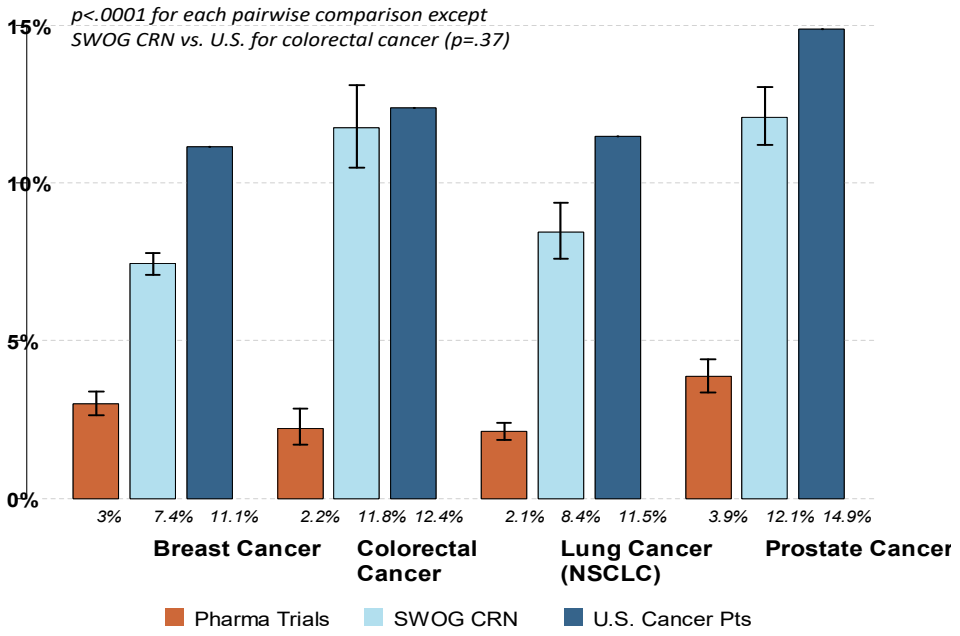
- ‘The best treatment is a clinical trial.’
- ‘Tomorrow’s treatment, today.’
- ‘Shooting fish in a barrel’: biology-driven experimentation.

- Equitable access to clinical trials matters because…
  - Extrapolation of benefit/harms in unstudied populations
  - Timely accrual, completion, interpretation, implementation…
  - **Yes,……. lives matter!**

In this age of rapid-fire discovery, ‘the best treatment is a clinical trial…’



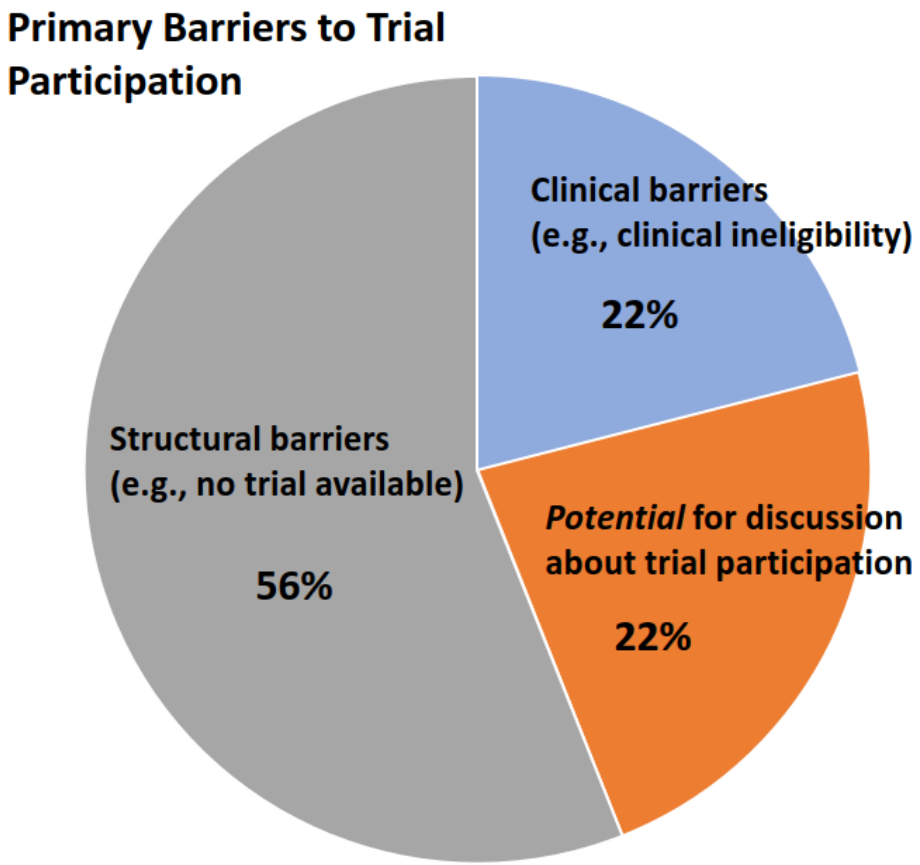
Proportion of Black patients by setting

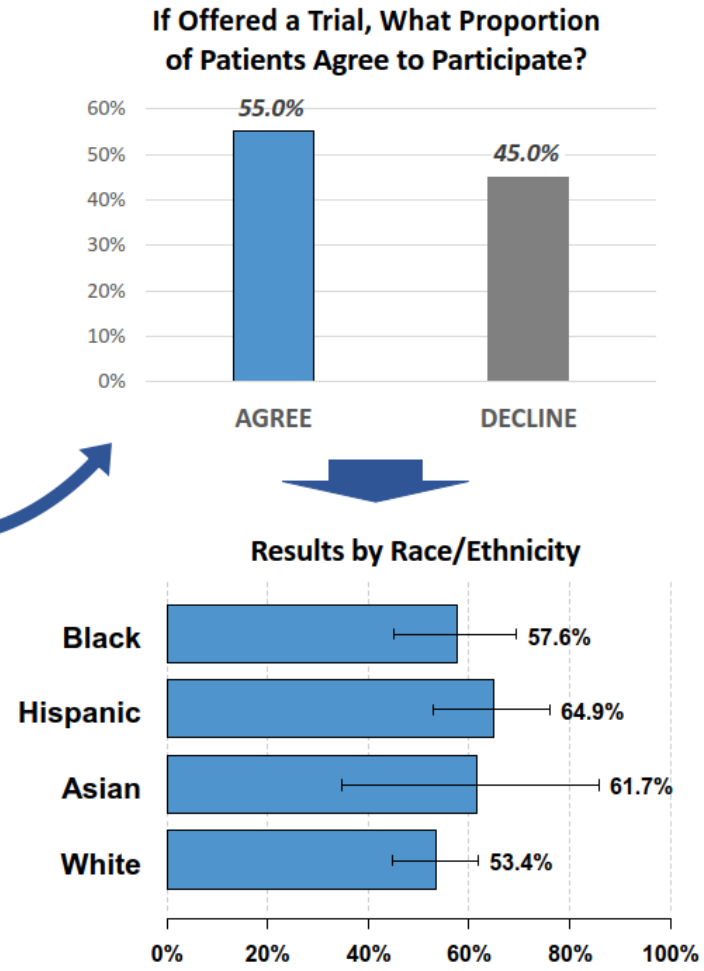


Proportion of Black patients by setting for common cancers

Unger JM, Hershman DL, Osarogiagbon RU, Gothwal A, Anand S, Dasari A, Overman M, Loree JM, Raghav K. Representativeness of Black Patients in Cancer Clinical Trials Sponsored by the National Cancer Institute Compared With Pharmaceutical Companies. JNCI Cancer Spectr. 2020. **PMID: 32704619**

The *Real* Barriers to Clinical Trials Participation





Unger JM, Vaidya R, Hershman DL, Minasian LM, Fleury ME. Systematic Review and Meta-Analysis of the Magnitude of Structural, Clinical, and Physician and Patient Barriers to Cancer Clinical Trial Participation. J Natl Cancer Inst. 2019;111:245-255. **PMID: 30856272**

Unger JM, Hershman DL, Till C, Minasian LM, Osarogiagbon RU, Fleury ME, Vaidya R. "When Offered to Participate": A Systematic Review and Meta-Analysis of Patient Agreement to Participate in Cancer Clinical Trials. J Natl Cancer Inst. 2021;113:244-257. **PMID: 33022716**

Framework for Solutions

- Understand where the true barriers are.
- Identify stakeholders:
  - Policymakers, organizations
  - Care delivery institutional leadership
  - Clinicians
  - Funders/sponsors
  - Patients/caregivers
  - Advocacy groups
  - Clinical trialists
- Make the stakeholder-centered case to each!
- Build infrastructure… meet the people where they are.
- Set goals, benchmark, measure, measure, measure….

Benchmarking, data collection, analysis and feedback

- Organizational
  - Institutional case-volumes
  - Clinical trials portfolio
- Physician
  - Credentialed
  - Participating
  - Accruing
- Research staff
  - Recruitment
  - Training
  - Retention
- Cultural:
  - ‘We are not a university, why are we doing this?’
  - ‘Time is money, this is a waste of time…’

Finding Enduring Solutions….!

- Build infrastructure where they population of interest resides: ‘meet people where they are…’
- Data centricity: ‘you can’t improve what you don’t measure…’
- Game out progress, set expectations: ‘fail to plan, plan to fail…’
- Team-building: ‘shared mental models, closed loop communication, mutual performance monitoring, mutual trust, back-up behavior, etc.’
- Financial models for sustainability: ‘no margin, no mission’
- Leverage technology

Osarogiagbon RU. ‘The Mid-South Miracle.’ Fred Hutch Cancer Center Value in Cancer Care Summit 2023. November 2, 2023.

Take-Home Messages

- Lung Nodule Programs provide a robust, complementary, epidemiologically sound pathway to early lung cancer detection.
  - Provides access to early detection to a non-overlapping, high-risk population.
  - Concurrent deployment alleviates looming disparities inadvertently induced by LDCT.
  - Can be implemented even when LDCT unavailable.
- Multidisciplinary decision-making saves lives, synthesizes decision-making.
- Close attention to surgical quality a vital component for population impact.
- Program-based care creates the shortest pathway to population-level lung cancer outcomes improvement.
- ***The best treatment is a clinical trial***; build clinical trials infrastructure where the population is.

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