The Beaumont-RCSI-Irish Cancer Society Lung Health Check: *A Blueprint for an Irish National Lung Cancer Screening Service*

Dr James Ryan *BSc CPC, MB, BCh, BA, MRCPI, FFR RCSI*
Consultant Radiologist Beaumont Hospital
Lung Health Check Radiology Lead



LUNG HEALTH CHECK

BEAUMONT RCSI CANCER CENTRE

Proudly funded by Irish Cancer Society

Disclosures

- Lung Health Check Radiology Lead for Alliance Medical.

- Lung Health Check CTs are reported on a fee-per-service basis.

Lung Cancer in Ireland

Commonly presents late, leading to increased mortality

20% of annual cancer deaths in Ireland

~2,000 deaths per year

Stage I
Often curable
Higher survival
Lower long-term cost

Stage IV
Systemic therapy required
Lower survival
Higher continuing care cost

Current Evidence for Lung Cancer Screening

NLST

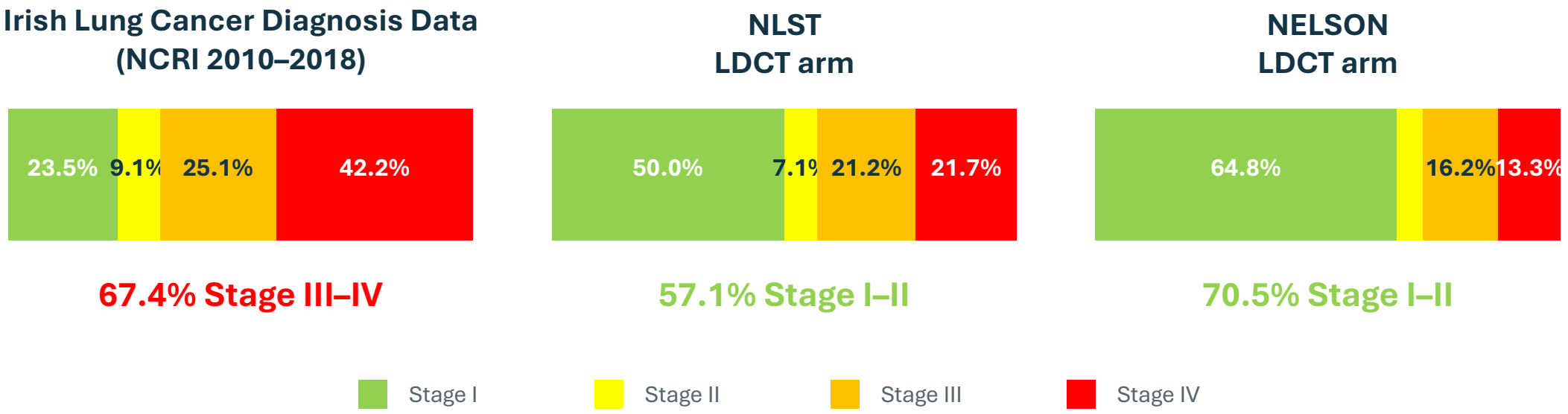


NELSON



High-risk population → Low-dose CT → Earlier detection → Reduction in Lung Cancer Mortality ~20-25%

Screening Leads to a Stage Shift in Lung Cancer Diagnosis



Sources: NCRI; AHRQ/USPSTF Evidence Synthesis No. 198 (2021); Horeweg et al., AJRCCM 2013.

Limitations

NLST



NELSON




Targeted Lung Health Check Programme
www.mft.nhs.uk/lunghealthcheck/
NHS
Greater Manchester
Cancer Alliance
"Catching lung cancer early can make a big difference"
For more information, please come inside and talk to our team.

Ireland’s First Community Based Lung Cancer Screening Pilot





Prof Dan Ryan
Clinical Lead



Dr James Ryan
Radiology Lead



Prof Patrick Redmond
GP Lead

LUNG HEALTH CHECK

BEAUMONT RCSI CANCER CENTRE

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Core Team



Sandra Roche PhD
Programme Manager



Prof Jarushka Naidoo
Principal Investigator

The Radiology Team



Dr James Ryan



Dr Neasa Ni Mhuirceartaigh



Dr Marie Bambrick



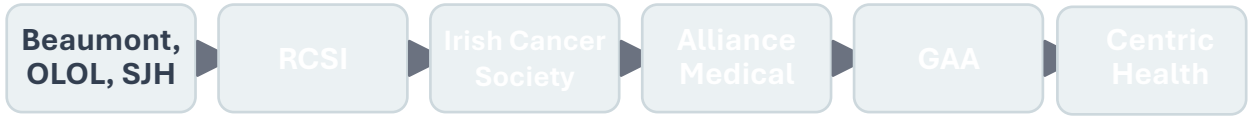
Dr Mary Louise Gargan



Dr Ruth Dunne

The Stakeholders

Clinical care & downstream management



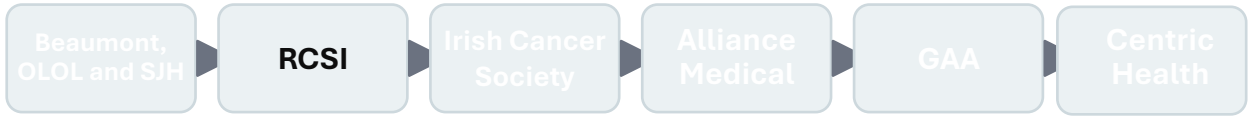
Beaumont, OLOL and SJH

ROLE IN THE LUNG HEALTH CHECK

- Clinical care & downstream management for participants with significant findings

The Stakeholders

Academic sponsorship & research



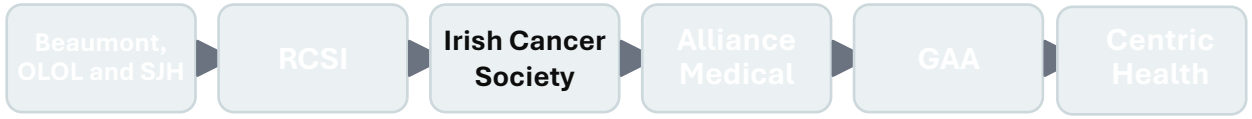
RCSI

ROLE IN THE LUNG HEALTH CHECK

- Provides academic and research support

The Stakeholders

Funding, awareness & engagement



Irish Cancer Society

ROLE IN THE LUNG HEALTH CHECK

- Provided the majority of funding for the pilot
- Supported community awareness of lung cancer screening and helped engage the target population

The Stakeholders

Mobile CT & integrated screening infrastructure

Beaumont, OLOL and SJH → RCSI → Irish Cancer Society → **Alliance Medical** → GAA → Centric Health

Alliance Medical

ROLE IN THE LUNG HEALTH CHECK

- Provides an end-end Lung Cancer Screening Service
  - CT-Truck
  - Radiographers
  - Physicists
  - IT Support

The Stakeholders

Community access

Beaumont, OLOL and SJH → RCSI → Irish Cancer Society → Alliance Medical → **GAA** → Centric Health

GAA

ROLE IN THE LUNG HEALTH CHECK

- **Provided locations for the mobile Lung Health Check CT Truck**
  - Making a community based service possible

Lung Health Check – At Community Sites

CROKE PARK

Dublin City North

1. Glasnevin Family Practice
2. Willow Park Medical Centre
3. Finglas Medical
4. Castleknock
5. Navan Rd

O'Toole's GAA ARYFIELD

1. Raheny Medical
2. Donaghmede Medical

Fingallians GAA SWORDS

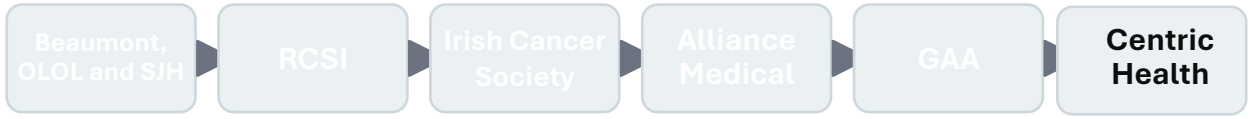
1. Boroimhe Medical
2. Ashbourne Clinic
3. Applewood Medical
4. The Plaza Clinic

O'Raghalllaigh DROGHEDA

1. The Cottage Surgery
2. Bryanstown Medical
3. Fairgate Medical
4. Hilltop Medical
5. Northgate Surgery
6. The Square Medical
7. Headfort Family Practice
8. Trim Medical

The Stakeholders

Participant identification & risk stratification



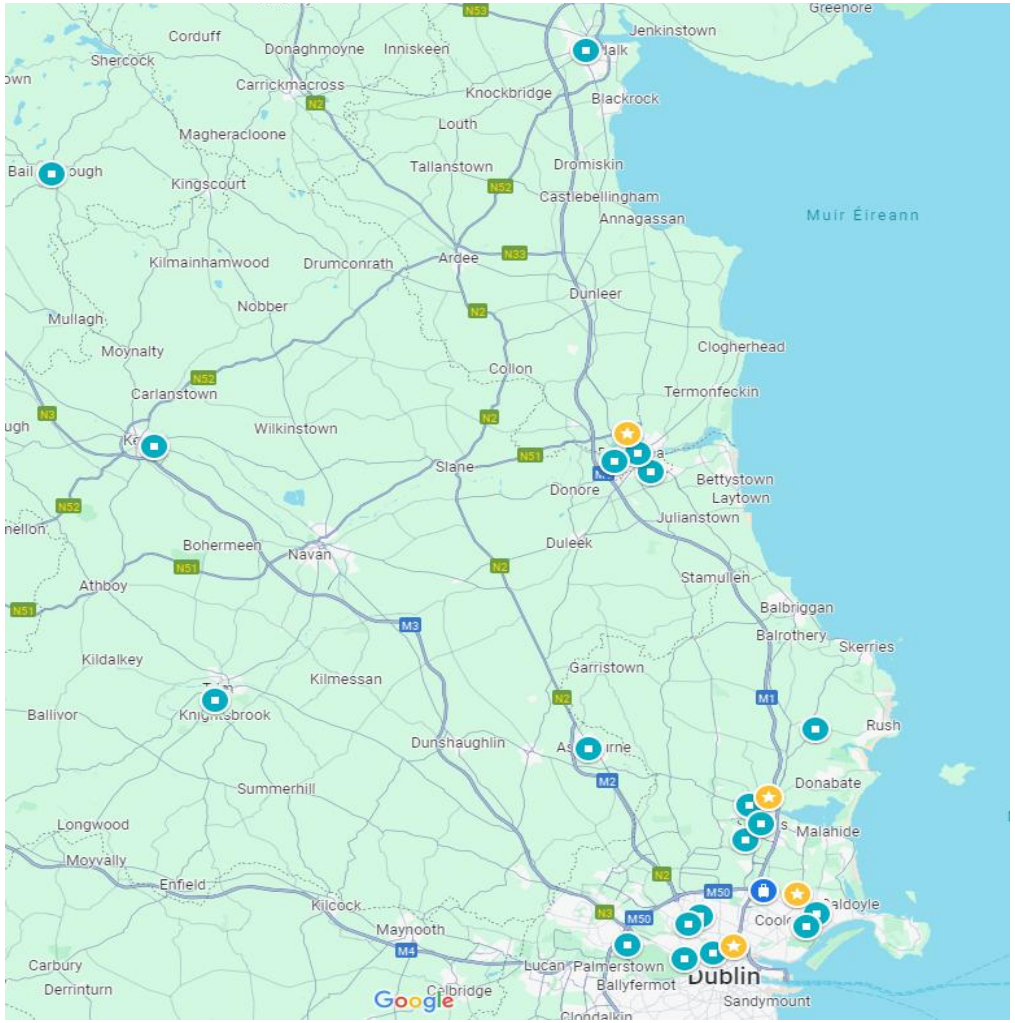
Centric Health

ROLE IN THE LUNG HEALTH CHECK

- Provided patient database from which participants were identified

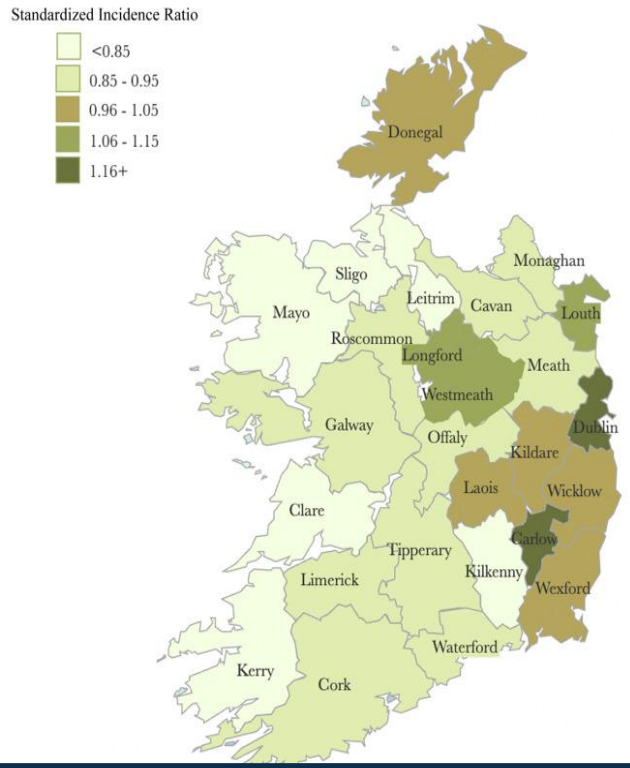
Targeted Screening in Ireland

GP practices across North Dublin and the North East Region



1. Glasnevin Family Practice
2. Willow Park Medical Centre
3. Finglas Medical
4. Castleknock
5. Navan Rd
6. The Cottage Surgery
7. Bryanstown Medical Centre
8. Fairgate Medical Practice
9. Hilltop Medical
10. Northgate Surgery
11. The Square Medical
12. Headfort Family Practice
13. Trim Medical
14. Raheny Medical
15. Donaghmede Medical Centre
16. Boroimhe Medical
17. Ashbourne Clinic
18. Applewood Medical
19. The Plaza Clinic

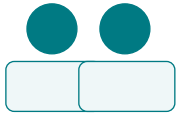
Centric Health



The Lung Health Check Pathway

FROM IDENTIFICATION → ACTIONABLE FOLLOW-UP

1

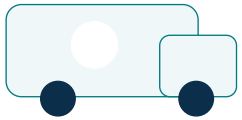


Identify & stratify

Centric Health patient database

AT RISK → LHC INVITATION

2

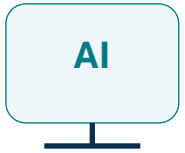


Community LHC visit

Participant attends the LHC CT truck at the GAA site for acquisition of a low-dose chest CT

GAA SITE • LDCT

3



AI-assisted reporting

Radiologist reads the LDCT in DeepHealth with AI support and a bespoke AI-integrated reporting template

RADIOLOGIST + AI

4



Nelson automation

Radiology report ingested → automated outputs

- GP letter
- Patient letter
- RALC list
- Significant findings

Who Gets Screened?



Risk thresholds

PLCOm2012 ≥ 1.51%
OR
LLPv2 ≥ 2.5%

Identifies a high-risk population for screening

Lung Health Check: Participant Experience

Spirometry → Symptom questionnaire → Nurse consultation → Smoking cessation → Biomarkers → Low-dose CT

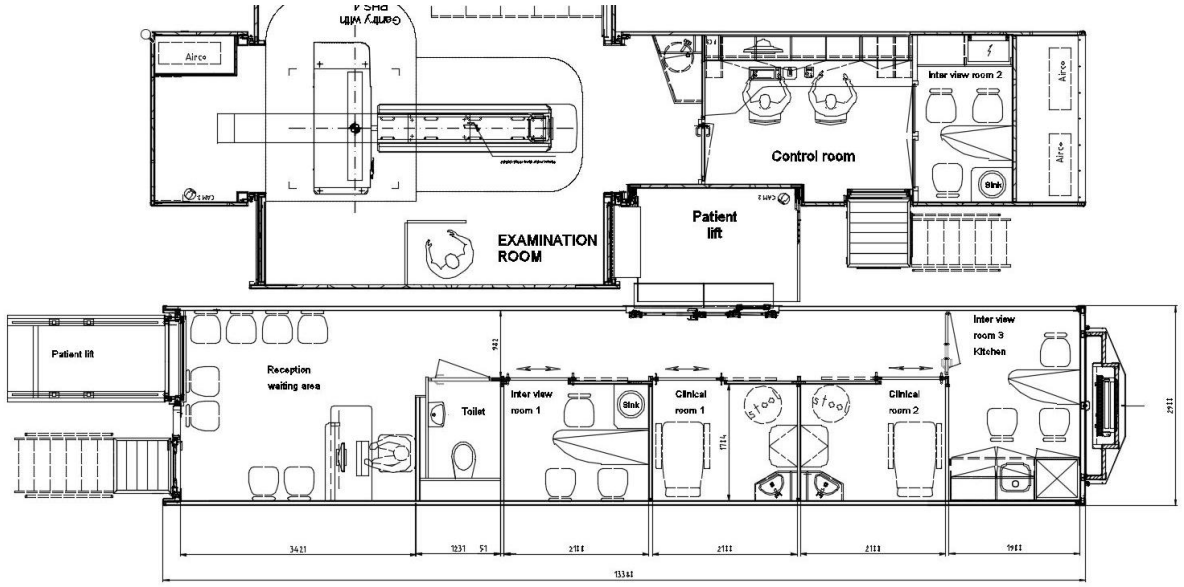


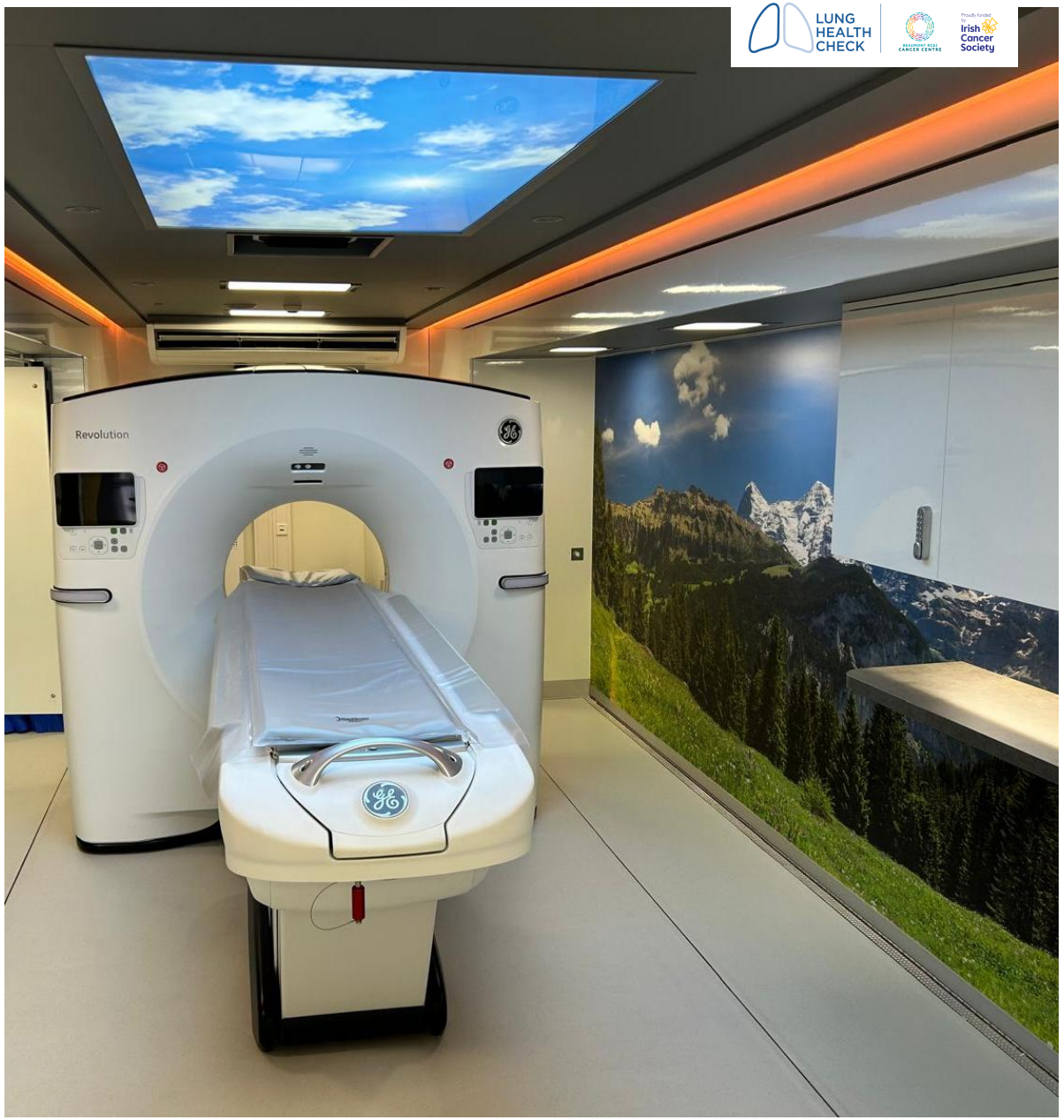






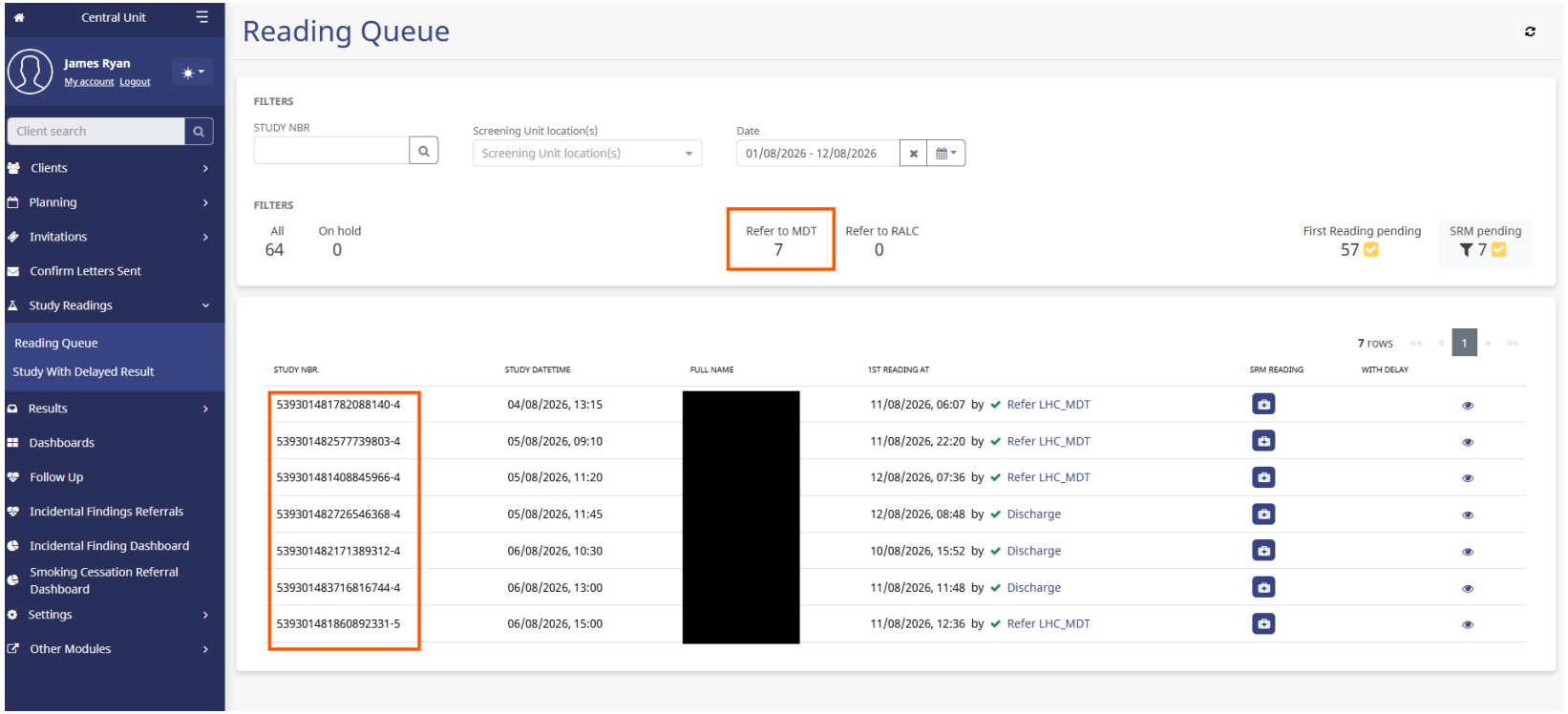






GE Revolution Maxima (72kW EMEA)

Nelson +



NELSON+

Screening management

Automate pathway

Structured report ingested and converted into pathway actions

AUTOMATIC OUTPUTS

- GP letter
- Patient letter
- RALC Lists
- Significant finding Lists

GP Letter



Centric Health Northgate

Northgate Surgery (A92 E088), Co Louth

Further Information:

www.LungHealthCheck.ie

RE: Participant [redacted]

[redacted]

Dear Dr [redacted]

You may recall that some of your patients have been invited to take part in the Lung Health Check (LHC) pilot. The above participant had a repeat Low Dose CT Scan on [redacted] The results of the Low Dose CT scan are below.

Findings suspicious of Lung Cancer (actioned by LHC Team)

We have explained that there is an abnormal finding to the participant and have made a referral to their preferred local hospital team for Rapid Access Lung Clinic (RALC) and review. We have arranged for the images to be transferred to the hospital team, who will communicate any further findings with you directly. Please include in your records that this patient has been referred to the Rapid Access Lung Clinic (RALC).

Name	Value	Recommendation
Emphysema	moderate	The participant has been informed of these smoking related changes. We strongly recommend stopping smoking if the participant is a current smoker.

Spirometry Result

The main result of the spirometry assessment is as follows: **Airway Obstruction (Known diagnosis).** This is in keeping with the participants known diagnosis and no further investigation is required at this time.

Thank you to you and your practice for supporting the LHC pilot. This examination involved a medical exposure to ionising radiation. Information relating to this exposure can be found at https://www.alliancemedical.ie/wp-content/uploads/2022/04/Practitioner_to_Patient_Explanation-poster.pdf. The participant / GP can also contact the Lung Health Check team for the specific radiation dose associated with the low dose CT examination. If you need any further information or advice, please contact us on **061 514 555** Monday to Friday 9am-5pm or email us at lunghealthcheck@beaumont.ie.

Lung Health Check screening services provided by



Incidental Findings



Incidental Findings

High prevalence of potentially actionable findings

~48%

emphysema

69%

coronary artery calcium

Potentially actionable referrals

- ILA 4.4%
- Adrenal 5.3%
- Thyroid 1.8%
- Breast 1.5%
- Renal Mass 1.1%
- Aortic valve Ca 1.4%

Strategies to Reduce Incidental Finding Referrals

High prevalence findings and potentially actionable findings

Use evidence-based guidelines for consistency

Potentially significant incidental findings were reviewed at the weekly Screening Review Meeting

European Journal of Cardio-Thoracic Surgery 2023, ezad302
https://doi.org/10.1093/ejcts/ezad302

POSITION STATEMENT

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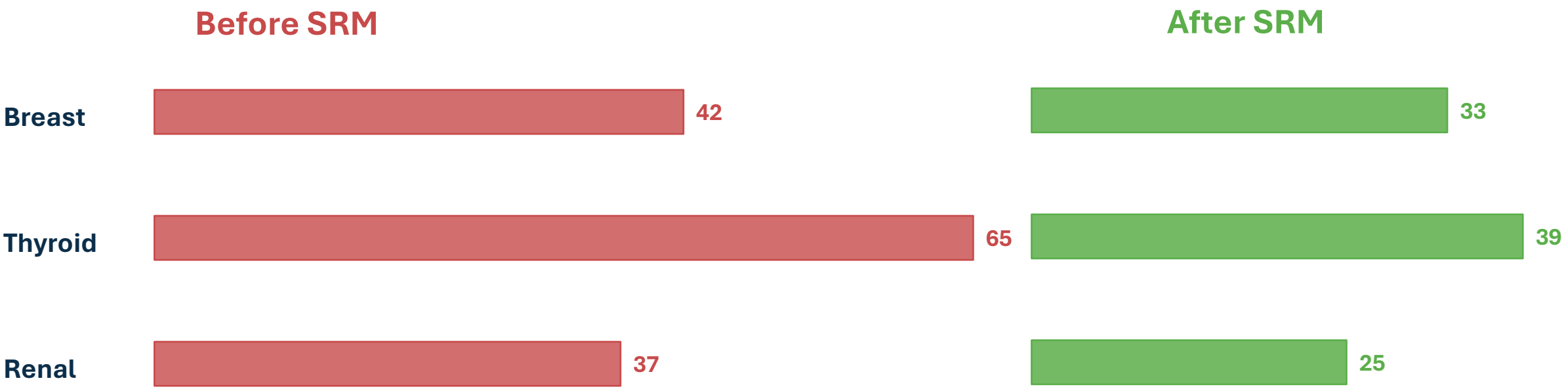
ERS/ESTS/ESTRO/ESR/ESTI/EFOMP statement on management of incidental findings from low dose CT screening for lung cancer

Emma L. O'Dowd[a,b], Ilona Tietzova[c], Emily Bartlett[d], Anand Devaraj[d], Jürgen Biederer[e,f,g,h], Marco Brambilla[i], Alessandro Brunelli[j], Joanna Chorostowska [k], Herbert Decaluwe [l], Dirk Deruysscher[m], Walter De Wever[n], Matthew Donoghue[o], Aurelie Fabre[p], Mina Gaga [q], Wouter van Geffen [r,s], Georgia Hardavella[t], Hans-Ulrich Kauczor[e,f], Anna Kerpel-Fronius [u], Jan van Meerbeeck [v], Blin Nagavci[w], Ursula Nestle[x], Nuria Novoa[y], Helmut Prosch [z], Mathias Prokop[aa], Paul Martin Putora[ab,ac], Janette Rawlinson[ad], Marie-Pierre Revel [ae,af], Annemiek Snoeckx[ag], Giulia Veronesi[ah], Rozemarijn Vliegenthart[ai], Sabine Weckbach[aj,ak], Torsten G. Blum[al] and David R. Baldwin [b,am,*]

Mitigating the Incidentaloma Cascade

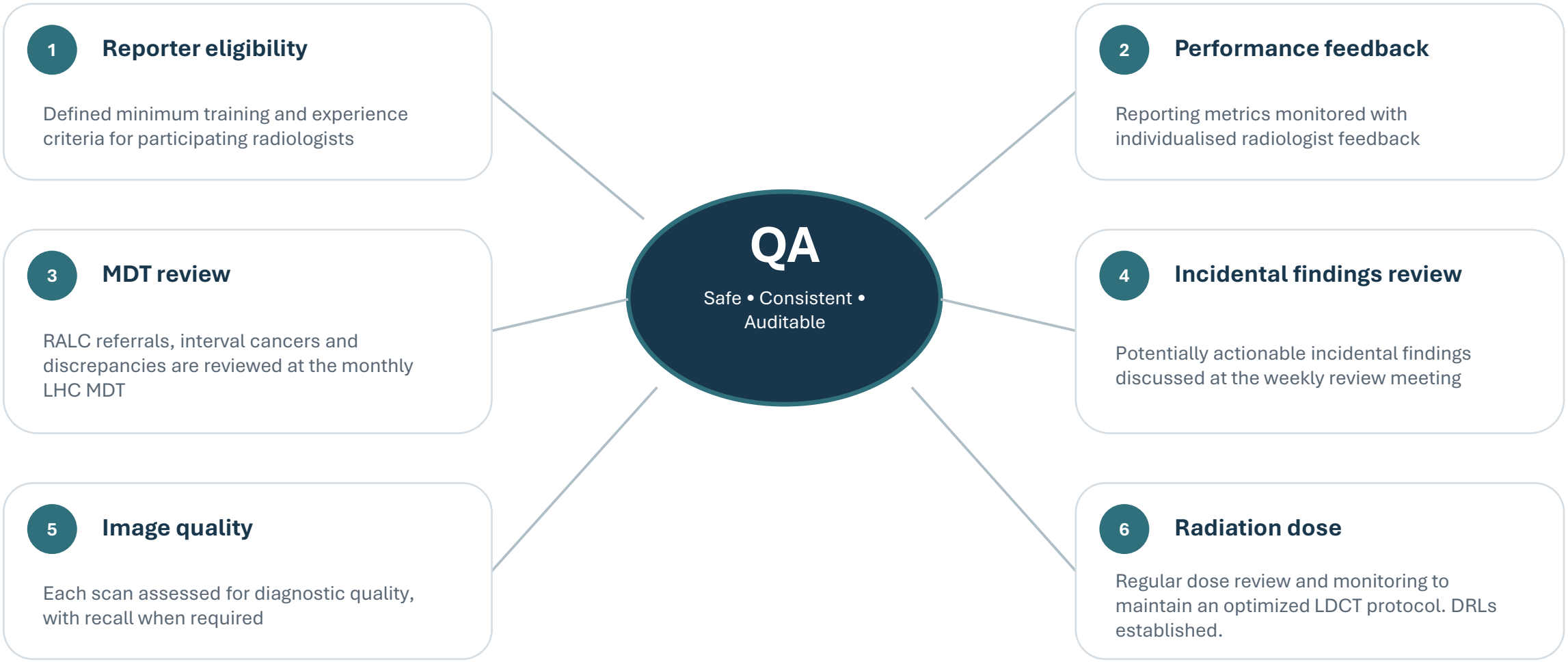
Consensus review reduced downstream referral burden



Quality Assurance



Radiology Quality Assurance Framework



First Round of Screening Results



First Round Pilot Results at a Glance

~74%

participation

2,184

LDCT scans completed

~1.6%

cancer detection rate

~80%

Stage I–II

13.4%

T0+3 recall

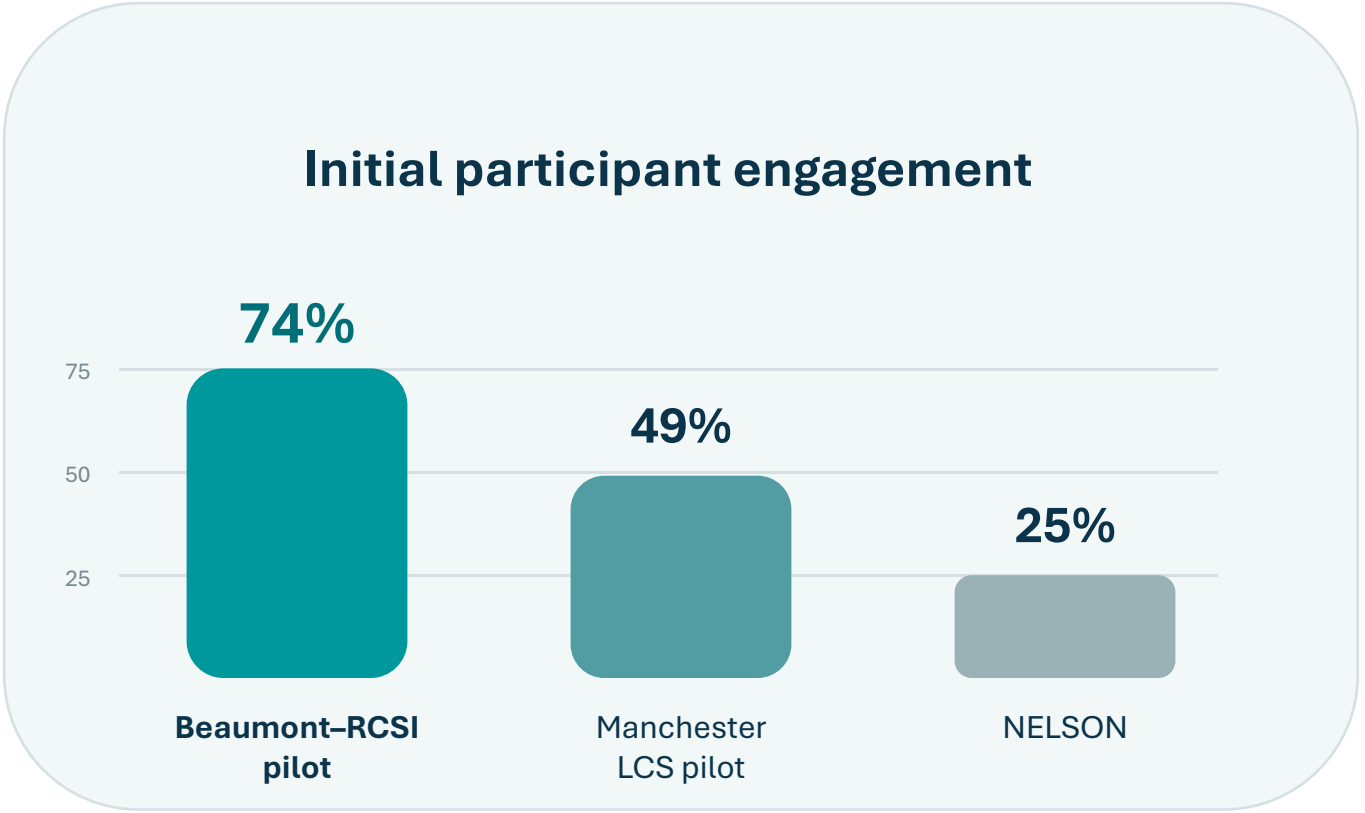
3.4%

RALC referral

Participation

Initial engagement with lung cancer eligibility / risk assessment



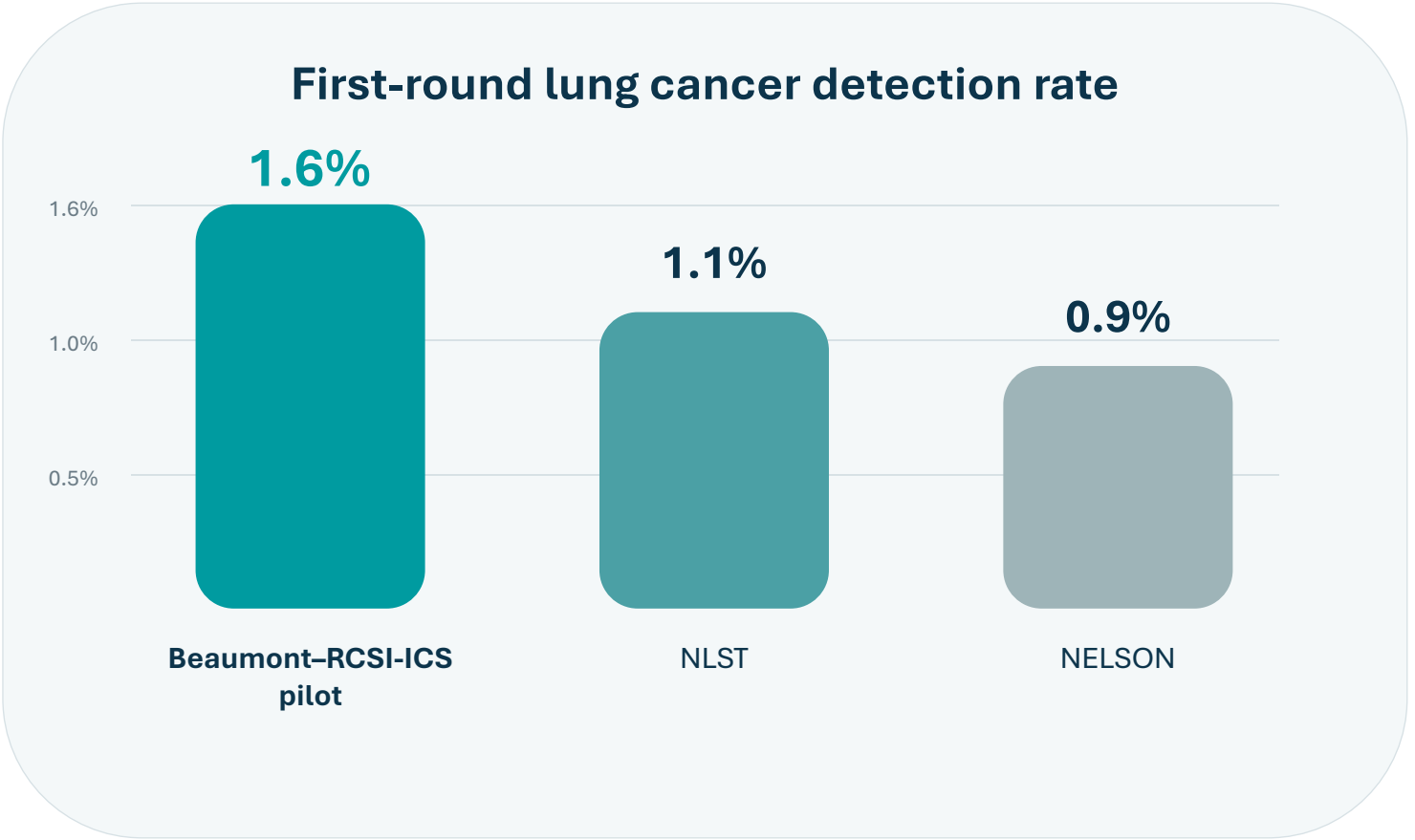


Cancer Detection at Baseline LDCT

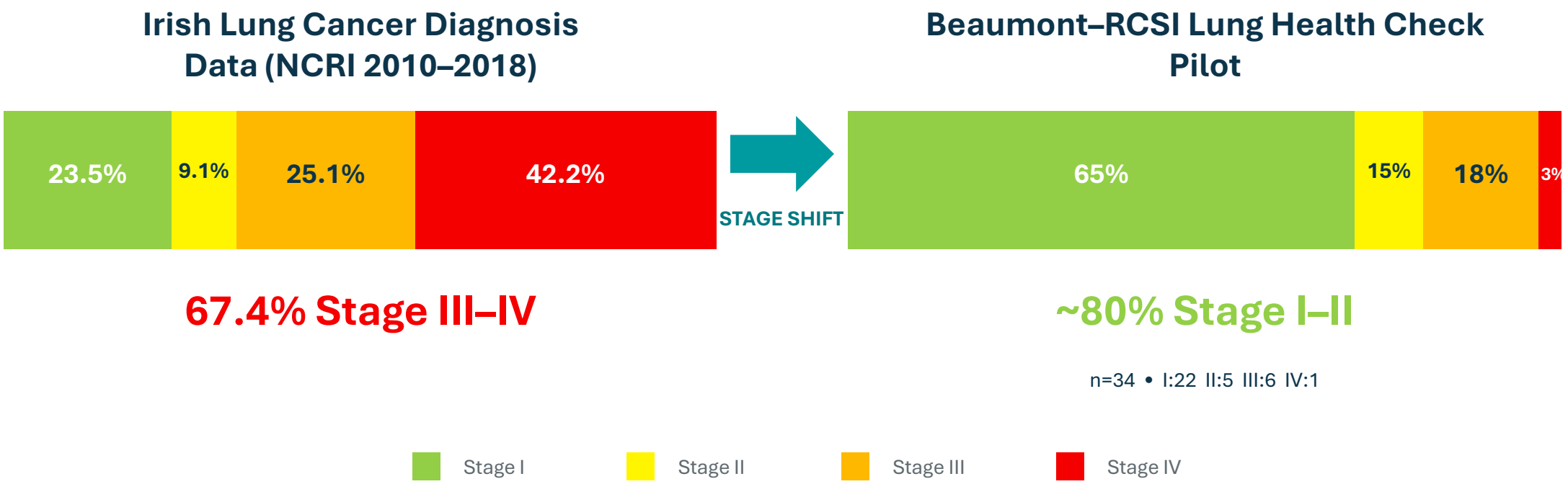
Beaumont–RCSI-ICS pilot compared with the landmark screening trials



Our baseline detection rate is comparable to—and slightly higher than—the landmark LDCT trials



Stage Shift in Screening Population



Sources: NCRI; Beaumont–RCSI Lung Health Check Pilot.

Key Learning Points



What this Irish Pilot has Demonstrated

- High participation is achievable
- Community screening is feasible
- Low dose diagnostic quality CT is achievable at scale
- AI-assisted structured reporting works well
- IF referral burdens can be mitigated through use of evidence-based guidelines and review meetings
- Most detected cancers were early stage

Thank you

LUNG HEALTH CHECK

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