SCAN
South East Scotland Cancer Network

NHS SCOTLAND

Working regionally to improve cancer services

SOUTH EAST SCOTLAND CANCER NETWORK
PROSPECTIVE CANCER AUDIT

Lung Cancer 2023
QPI Comparative Audit Report

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Document History

Version	Circulation	Date	Comments
Version 1	Lead Clinicians	01/11/2024	Draft results and outliers circulated in individual SCAN Health Boards.
Version 1.1	Lead Clinician & Regional Audit/Sign Off Sub Group	07/11/2024	To clarify Actions and provide and/or agree outstanding clinical commentary.
Version 2	To Lead Clinician	05/12/2024	Report to Lead Clinician to provide “Chair Summary”.
Version 3	To SCAN Lung Group.	07/01/2025	To SCAN Lung Group for final approval.
Final SCAN Report Index SAL01/25	SCAN Lung Group SCAN Governance Framework SCAN Action Plan Board Leads	31/01/2025	Any potentially disclosive data to be removed prior to publication on SCAN Website.
Version 4W	Report published to SCAN Website	January 2026	

Chair Summary

SCAN Lung Cancer 2023
Quality Performance Indicators (QPI) Comparative Report
Comment by Chair of the SCAN Lung Group

Reflecting on the previous year's audit report it is heartening to see continued success in some of our QPIs, particularly around treatments for our lung cancer patients.

QPI 12 (SCLC treatments) has improved having previously been an area of concern, most likely as a result of the Quality Improvement intervention with 'SCLC alert' and the persistent diligence of our pathology and clinical teams.

Whilst meeting QPI 7 last year (2022), there was some concern about adequacy of lymph node assessment during surgical resection and I am grateful to Anthony Chambers and the thoracic surgical team for their work looking at this in greater detail. In 2023, QPI 7 shows a significant improvement, thought predominantly to be due to access to robotic thoracic surgery. This is perhaps an early indicator of improvement in quality associated with access to advanced technologies.

In the front end of the lung cancer pathway (diagnosis and staging) we continue to see significant challenges in achieving a timely and accurate diagnosis, more particularly the access to PETCT reporting within 10 days (QPI 4) which remains unattainable, and is a problem not isolated to SCAN. Incidentally in Fife, where patients travel outwith the SCAN region for access to PETCT, we have seen continued decline in this metric. Promising work from the WGH team may offer a faster pathway for patients with stage II/III disease which I hope we will see evidence of in next year's audit.

QPI15 (pathological diagnosis pre radical treatments) continues to be difficult to achieve although tissue confirmation rates are slowly rising as we adopt new diagnostic pathways but will be challenging to meet without significant investment in diagnostic modalities.

For the first time in the introductory section of this report we have published some data using NLCA (National Lung Cancer Audit) specific performance descriptors, as used in England and Wales, enabling us to better benchmark our activity against the rest of the UK which should be valuable for future quality improvement.

I am grateful to all members of SCAN who have contributed to the collection and review of this data, in particular to the SCAN lung cancer audit team.

Adam Marshall, January 2025

Clinical Action Plans

2023 Action Plan

QPI	Action required	Person Responsible	Date for update
QPI 2 (i)	To enable equitable reporting across the UK it would be beneficial to align QPI reporting with that of NLCA. This would provide a unified benchmark against which to measure performance. To discuss at Formal Review Cycle 3.	Formal Review Cycle 3.	SCAN Lung Group meeting
QPI 2 (ii), (iii), & (iv)	All health boards are consistently exceeding the target year on year. To archive at Formal Review 3	Formal Review Cycle 3.	SCAN Lung Group meeting
QPI 4	There is an overwhelming lack of PET CT capacity in SCAN (and across Scotland) which is additionally impacted by competing pressures on PET CT service from specialities other than lung cancer and as required for 2nd line oncology treatment within the service. A pilot is underway at WGH with scheduled PET CT coinciding with Respiratory OP clinics where patients with stage II/III, where mediastinal staging is important, will receive PET CT the next day (2 protected slots), followed by EBUS early the following week.	Dr Adam Marshall	RCPG meeting, August 2025
QPI 6 (i)	To enable equitable reporting across the UK it would be beneficial to align QPI reporting with that of NLCA. This would provide a unified benchmark against which to measure performance. To discuss at Formal Review Cycle 3.	Formal Review Cycle 3.	SCAN Lung Group meeting
QPI 11 (ii)	EGFR biomarker testing is screened for exons 18-21, with the exon type informing the TKI agent-specific treatment management. Of the EGFR Exon mutations, exon 20 is **not** indicated for first line TKI treatment. The QPI audit is primarily concerned with first line treatment and this particular exon mutation should have been excluded from QPI 11 (ii) from the outset. This oversight has come to light this year when exploring outlier reasons to explain why targeted therapy was not given to individual patients. Take to FR3 – to exclude Exon 20 from the analysis.	Formal Review Cycle 3, Dr David Dorward	SCAN Lung Group meeting

QPI	Action required	Person Responsible	Date for update
QPI 11 (iii)	It has been noted that the criteria have been incorrectly specified because the immunotherapy agent Pembrolizumab is only available to stage IV patients by licence. Stage III patients can only receive Pembrolizumab for second line treatment which is not in audit's QPI reporting remit. The QPI process is concerned only with first line treatment. Additionally patients with PS2 are not eligible for first line immunotherapy. **Action:** Formal Review Cycle 3 – QPI denominator to be amended to *All patients with NSCLC who are stage IV and PS 0-1 not having surgery that are oncogene mutation negative*.	Formal Review Cycle 3.	SCAN Lung Group meeting
QPI 12 (ii)	Formal Review 3: to consider adding detail or an additional QPI *Chemoimmunotherapy for SCLC* which, is now a standard first line treatment.	Formal Review Cycle 3.	SCAN Lung Group meeting
QPI 13	Treatment options have evolved where curative treatment can be given as a 'package', for example surgery plus adjuvant SACT or Chemoradiotherapy plus adjuvant immunotherapy. The current methodology does not accommodate cases where a patient's death might be related to, for example, immunotherapy induced pneumonitis rather than resulting from the initial chemoradiotherapy component. Formal Review 3: Discussion around curative treatment 'packages' within 30- and 90-day mortality analyses and reporting with a view to accommodate these in the analyses.	Formal Review Cycle 3.	SCAN Lung Group meeting
QPI 14	Given the QPI has not been achieved in NHS Fife over the last few years, it is important to audit these cases to confirm the level of comorbidity and frailty in each case and the appropriateness of that management outcome. An audit should also examine if there were any other barriers to treatment, for example: travel distance and explore survival outcomes.	Dr Iain Murray Dr Tamasin Evans Dr Almudena Cascales	Q4 2025

QPI	Action required	Person Responsible	Date for update
QPI 15 (i) & 15 (ii)	Pathological Diagnosis prior to surgery & radical radiotherapy: The target continues to be challenging. The appropriateness of identical targets for QPI 15 (i) prior to surgery and QPI 15 (ii) prior to radical radiotherapy was discussed. Surgical patients are generally of better fitness levels than those patients who have radical radiotherapy and as such would be expected to perform better, i.e. be more suitable for biopsy prior to treatment. These two groups of patients form distinct categories based on differing fitness and comorbid levels and, separate and different targets would be more appropriate. The target of 75% is appropriate to those 'fitter' patients having surgical resection but should be revised for patients of the second, less fit, cohort type. Formal Review Cycle 3 1. To discuss the relevance of Herder score. 2. To request a change in target levels to distinguish between the different cohort types associated with QPI 15 (i) and (ii). The target for QPI 15 (ii) should be discussed and reduced.	Formal Review Cycle 3.	SCAN Lung Group meeting
QPI 16	Although this QPI was passed by all SCAN HBs, discussion at the National Lung Cancer Audit & Education Event hosted by SCAN in May 2024 led to a desire to have an overall 'national' MDT approach to facilitate the recording of all QPI requirements. Formal Review Cycle 3: discuss the option of having a 'national' MDT form.	Formal Review Cycle 3.	SCAN Lung Group meeting
General	CNS Provision: to continue to highlight CNS resource deficits as part of the national agenda.	Dr Adam Marshall	RCPG meeting, August 2025

Historical action plans are available in previous SCAN Comparative Lung Cancer QPI Reports which can be found on the SCAN website (www.scan.scot.nhs.uk).

Lung Cancer QPI Attainment Summary 2023		Target %	Borders		D&G		Fife		Lothian		SCAN	
QPI 1 MDT discussion		95	N 100 D 101	99.0%	N 134 D 135	99.3%	N 358 D 358	100%	N 703 D 729	96.4%	N 1295 D 1323	97.9%
QPI 2 Pathological Diagnosis	All patients with lung cancer	80	N 52 D 70	74.3%	N 77 D 114	67.5%	N 143 D 180	79.4%	N 380 D 466	81.5%	N 652 D 830	78.6%
	NSCLC with sub-type identified	90	N 47 D 49	95.9%	N 72 D 72	100%	N 137 D 152	90.1%	N 359 D 372	96.5%	N 615 D 645	95.3%
	Non-Squamous, III-IV: Oncogenic Profiling	80	N 20 D 24	83.3%	N 36 D 40	90.0%	N 80 D 83	96.4%	N 166 D 185	89.7%	N 302 D 332	91.0%
	NSCLC IIIB-IV: PDL1 testing	80	N 33 D 39	84.6%	N 48 D 50	96.0%	N 113 D 116	97.4%	N 218 D 244	89.3%	N 412 D 449	91.8%
QPI 4 PET CT for NSCLC within 10 days from request to report		95	N 0 D 19	0.0%	N 3 D 24	12.5%	N 1 D 55	1.8%	N 33 D 148	22.3%	N 37 D 246	15.0%
QPI 5 Nodal Sampling to confirm Mediastinal Malignancy		80	N 7 D 7	100%	N 7 D 13	53.8%	N 15 D 22	68.2%	N 47 D 55	85.5%	N 76 D 97	78.4%
*QPI 6 Surgical resection in NSCLC	All NSCLC	20	N 6 D 48	12.5%	N 17 D 72	23.6%	N 18 D 152	11.8%	N 82 D 372	22.0%	N 123 D 644	19.1%
	NSCLC stage I-II	60	N 6 D 10	60.0%	N 12 D 14	85.7%	N 16 D 30	53.3%	N 71 D 103	68.9%	N 105 D 157	66.9%
*QPI 7 Lymph node assessment for NSCLC patients having pneumonectomy or lobectomy		80	Analysis is by Hospital of Surgery – RIE:						N 124 D 135	91.9%	n/a	
QPI 8 Radiotherapy (including SABR) for inoperable lung cancer		35	N 15 D 24	62.5%	N 10 D 16	62.5%	N 33 D 101	32.7%	N 97 D 201	48.3%	N 155 D 342	45.3%
QPI 9 Chemoradiotherapy for locally advanced NSCLC		50	N 1 D 4	25.0%	N 2 D 3	66.7%	N 4 D 7	57.1%	N 10 D 14	71.4%	N 17 D 28	60.7%
QPI 10 Chemoradiotherapy for limited stage SCLC		70	N 0 D 0	n/a	N 1 D 2	50.0%	N 1 D 2	50.0%	N 5 D 5	100%	N 7 D 9	77.8%

Lung Cancer QPI Attainment Summary 2023		Target %	Borders		D&G		Fife		Lothian		SCAN	
QPI 11 SACT for patients with NSCLC	All types of SACT for NSCLC	35	N 19 D 42	45.2%	N 28 D 48	58.3%	N 52 D 120	43.3%	N 132 D 263	50.2%	N 231 D 473	48.8%
	Targeted Therapy for NSCLC, stages IIIB-IV (based on Analysis B, p19)	80	N 4 D 4	100%	N 6 D 7	85.7%	N 6 D 6	100%	N 18 D 22	81.8%	N 34 D 39	87.2%
	Immunotherapy for NSCLC, stages IIIB-IV	40	N 2 D 5	40.0%	N 9 D 18	50.0%	N 14 D 35	40.0%	N 52 D 83	62.7%	N 77 D 141	54.6%
QPI 12 SACT for patients with SCLC	All types of chemotherapy for SCLC	70	N 3 D 4	75.0%	N 2 D 5	40.0%	N 18 D 27	66.7%	N 39 D 44	88.6%	N 62 D 80	77.5%
	Palliative chemotherapy for SCLC for treatment with non-curative intent	50	N 2 D 3	66.7%	N 1 D 3	33.3%	N 15 D 24	62.5%	N 26 D 29	89.7%	N 44 D 59	74.6%
*QPI 13.1 30 Day Mortality After Treatment	*Surgery	<5	Analysis is by Hospital of Surgery – RIE:						N 3 D 167	1.8%	n/a	
	Radical Radiotherapy	<5	N 0 D 9	0.0%	N 0 D 12	0.0%	N 1 D 36	2.8%	N 0 D 99	0.0%	N 1 D 156	0.6%
	Chemoradiotherapy	<5	N 0 D 7	0.0%	N 0 D 7	0.0%	N 0 D 15	0.0%	N 2 D 43	4.7%	N 2 D 72	2.8%
	Adjuvant Chemotherapy	<5	Centralised reports are available from PHS: 30-day mortality after systemic anti-cancer therapy (SACT) - patients treated in 2023 - 30-day mortality after systemic anti-cancer therapy (SACT) - Publications - Public Health Scotland									
	Palliative Chemotherapy (NSCLC)	<10										
	Palliative Chemotherapy (SCLC)	<15										
	Biological Therapy (NSCLC)	<10										
*QPI 13.2 90 Day Mortality After Treatment	*Surgery	<5	Analysis is by Hospital of Surgery – RIE:						N 3 D 166	1.8%	n/a	
	Radical Radiotherapy	<5	N 1 D 9	11.1%	N 0 D 12	0.0%	N 2 D 36	5.6%	N 3 D 98	3.1%	N 6 D 155	3.9%
	Chemoradiotherapy	<5	N 1 D 7	14.3%	N 1 D 7	14.3%	N 0 D 15	0.0%	N 5 D 43	11.6%	N 7 D 72	9.7%
QPI 14 SABR for Inoperable Lung Cancer with Stage I Disease		35	N 8 D 11	72.7%	N 4 D 12	33.3%	N 12 D 44	27.3%	N 50 D 104	48.1%	N 74 D 171	43.3%

Lung Cancer QPI Attainment Summary 2023		Target %	Borders		D&G		Fife		Lothian		SCAN	
QPI 15 Cytological / Histological Diagnosis Prior to Definitive Treatment	i. Surgery	75	N 9 D 9	100%	N 11 D 17	64.7%	N 14 D 18	77.8%	N 65 D 91	71.4%	N 99 D 135	73.3%
	ii. Radical Radiotherapy	75	N 6 D 13	46.2%	N 6 D 12	50.0%	N 26 D 35	74.3%	N 46 D 93	49.5%	N 84 D 153	54.9%
QPI 16 Contrast CT/MRI for N2 Patients Prior to Definitive Treatment		95	N 8 D 8	100%	N 6 D 6	100%	N 13 D 13	100%	N 28 D 29	96.6%	N 55 D 56	98.2%

Target Met	Target Not Met	Not applicable

* D&G patients have surgery at Golden Jubilee Hospital, Clydebank and are therefore included in WOSCAN's (West of Scotland Cancer Network) report for QPIs 7, 13(i) and 13(ii) – all being reported by HOSPITAL OF SURGERY.
All patients in NHS Borders, Fife and Lothian have thoracic surgery at the Royal Infirmary of Edinburgh (RIE).
Some patients from outwith the SCAN area have surgery at RIE, e.g. patients referred from Tayside. These are identified throughout the report as required.
SCAN totals are therefore not appropriate for QPIs 7 & 13(i) & 13(ii) and are marked as "n/a".

Detailed information regarding PS, TNM and stage groupings can be found in Appendices 3, 4 and 5 respectively.

Note: Allowance should be made where small numbers and variation may be due to chance and manifest as disproportionate percentages, which can distort results both positively and negatively. These should be viewed with a degree of caution.

See appendix 2 for historical Lung Cancer QPI Attainment Summary 2022

Introduction & Methods

Cohort

This report presents analyses of data collected on patients who are newly diagnosed with lung cancer between 1st January and 31st December 2023 and who were treated in one of the four constituent health board (HB) areas; comprising South East Scotland Cancer Network (SCAN) – Borders, Dumfries & Galloway (D&G), Fife, Lothian, and the Edinburgh Cancer Centre (ECC). The results contained within this report are generally presented by NHS board of diagnosis with the exception of surgical outcomes which are presented by hospital of surgery.

Datasets & Definitions

Quality Performance Indicators (QPIs) have been developed collaboratively with the three Regional Cancer Networks (SCAN, North Cancer Alliance (NCA), and West of Scotland Cancer Network (WOSCAN)); Public Health Scotland (PHS); and Healthcare Improvement Scotland (HIS).

The overarching aim of the cancer quality work programme is to ensure that activity at NHS board level is focused on areas most important in terms of improving survival and patient experience whilst reducing variance and ensuring safe, effective and person-centred cancer care. Following a period of development, public engagement and finalisation, each set of QPIs has been published by HIS[1]. Accompanying datasets and measurability criteria for QPIs are published on the PHS website[2]. NHS boards are required to report against QPIs as part of a mandatory and publicly reported programme at a national level.

QPI reporting for patients diagnosed with lung cancer was implemented on 01/04/2013. This is now the tenth publication of QPI results for lung cancer patients diagnosed in the SCAN region. QPIs are kept under regular review to be responsive to changes in clinical practice and emerging evidence: Baseline Review after year 1; Formal Review 1 (FR1) after years 2, 3 & 4 (and implemented at Year 5: 2017); and FR2 after years 5, 6 & 7. FR2 developments were disrupted by the COVID pandemic and consequently QPIs with new data items and/or codes were deferred to 2021 reporting, whereas those with existing data items were available for reporting in year 8 (2020).

Year 8, 2020	QPIs: 1, 2(i), 2(ii), 2(iv), 6, 7, 8, 9, 10, 12, 13, 14, 15, 16
Year 9, 2021	QPIs:2(iii), 4, 5, 11

The following QPIs have been updated at Formal Review, Cycle 2:

QPI	Change	Year of reporting
1	**Numerator:** Deleted the requirement *prior to definitive treatment.* FR2 Numerator: Number of patients with lung cancer discussed at the MDT meeting.	2020
2 (i)	**Exclusions:** The denominator was amended to exclude patients with performance status (PS) 3 and 4.	2020
2 (ii)	**Numerator:** NSCLC subtypes extended to include code 31: combination of non-small cell components (e.g. Adenosquamous).	2020
2 (iii)	**Denominator:** Staging changed from *IIIB-IV* to *III-IV* to include all stage III patients. New data item [PROFILE] (Yes/No)	2021

[1] QPI documents are available at Cancer Quality Performance Indicators (QPIs) – Healthcare Improvement Scotland

[2] Datasets and measurability documents are available at Lung cancer quality performance indicator (QPI) documentation (1 January 2021 onwards) - Lung cancer quality performance indicator (QPI) documentation - Publications - Public Health Scotland

QPI	Change	Year of reporting
2 (iv)	**New QPI:** to measure PDL1 testing. This QPI uses existing data items and codes.	2020
4	**QPI** amended to include timing element: *the report is available within 10 days of radiology request*. New data items; [PETREQDATE] & [PETREPORTDATE]	2021
5	**Archived at Baseline Review. Reinstated in amended format** Change to Dataset, unable to report in year 8.	2021
6 (i) & (ii)	**Exclusions:** Exclusions deleted: *patients who decline surgery* and *patients undergoing SABR*.	2020
8	**Denominator:** Staging changed from *III* to *I-IIIA*. **Exclusions:** Stage IV removed from exclusions. Stage is now specified in the	2020
10	**Denominator:** Staging changed from *I-IIIB* to *I-IIIA*	2020
11 (i)	**Data Set:** New data values (Codes 8, 9 & 10) added to data item [CHEMTYPE1-3].	2021
11 (ii)	**QPI:** amended to measure targeted therapy (TKIs[3]) New data value (Code 8) added to data item [CHEMTYPE1-3]. Target changed from 60% to 80%	2021
11 (iii)	**New QPI:** To measure immunotherapy and chemoimmunotherapy. New data values (Codes 8 & 9) added to data item [CHEMTYPE1-3].	2021
13.1 (v)-(vii)	**New standardised 30-day SACT Mortality QPI:** across all tumour types using data from ChemoCare to provide results for all lung cancer patients undergoing palliative SACT annually.	TBC
15 (i) & (ii)	**Numerator:** Treatment specified as *first* has been changed to *definitive*.	2020

QPI 15 (iii): Pathology prior to Chemoradiotherapy was archived at FR2. At FR1 QPI 3: Bronchoscopy and QPI 5: Mediastinal malignancy were archived. QPI 5 has been re-introduced (and amended) at FR2 and will be reported in year 9, i.e.2021.

The standard QPI format is shown below:

QPI Title:	**Short title of Quality Performance Indicator (for use in reports etc.)**	
Description:	Full and clear description of the Quality Performance Indicator.	
Rationale and Evidence:	Description of the evidence base and rationale which underpins this indicator.	
Specifications:	Numerator:	Of all the patients included in the denominator those who meet the criteria set out in the indicator.
	Denominator:	All patients to be included in the measurement of this indicator.
	Exclusions:	Patients who should be excluded from measurement of this indicator.
	Not recorded for numerator:	Include in the denominator for measurement against the target. Present as not recorded only if the patient cannot otherwise be identified as having met/not met the target.
	Not recorded for exclusion:	Include in the denominator for measurement against the target unless there is other definitive evidence that the record should be excluded. Present as not recorded only where the record cannot otherwise be definitively identified as an inclusion/exclusion for this standard.
	Not recorded for denominator:	Exclude from the denominator for measurement against the target. Present as not recorded only where the patient cannot otherwise be definitively identified as an inclusion/exclusion for this standard.
Target:	Statement of the level of performance to be achieved.	

[3] TKI: Tyrosine Kinase Inhibitors block certain enzymes and suppress cancer cell growth and division.

Audit Process
Data were collected and analysed by audit staff in each NHS board according to the dataset and measurability documentation provided by PHS. SCAN data was collated by Ailsa Patrizio, SCAN Cancer Information Analyst for Lung Cancer; and this report compiled.

Patients are mainly identified through registration at weekly Multi-Disciplinary Team Meetings (MDMs, also called MDT), and through checks made against pathology listings, General Register Office (GRO) records; and via a data mart from PHS: Acute Cancer Deaths and Mental Health (ACaDMe). Oncology data is available electronically via ARIA database downloads and the ChemoCare database.

Patients living closer to either Dundee or Carlisle may opt to have their oncology treatment outwith SCAN region or Scotland, respectively. Collecting complete audit data for these patients remains challenging.

The process is dependent on audit staff for capture and entry of data, and for data quality checking. Data is entered and interrogated on a national system used by all health boards across NHS Scotland: Electronic-Cancer Audit Support Environment (e-Case) and analysed via SQL Server Reporting Services (SSRS).

Lead Clinicians & Audit Personnel

SCAN Region	Hospital or Designation	Lead Clinician	Audit Support
SCAN	Clinical Lead Chair of SCAN Lung Group	Dr Adam Marshall	Ailsa Patrizio
NHS Borders	Borders General Hospital (BGH)	Dr Sunny Jabbal	Leanne Robinson
NHS Dumfries & Galloway	Dumfries & Galloway Royal Infirmary (DRI)	Dr Wasib Shah	Teresa Quintela Jenny Bruce
NHS Fife	Queen Margaret Hospital (QMH) Victoria Hospital (VHK)	Dr Iain Murray	Mimi Bjelorgrlic
NHS Lothian	Royal Infirmary of Edinburgh (RIE) Western General Hospital (WGH) St John's Hospital (SJH)	Dr Phil Reid	Ailsa Patrizio
SCAN	Edinburgh Cancer Centre (ECC)	Dr Colin Barrie Dr Kirsty MacLennan Dr Tamasin Evans Dr Sorcha Campbell	

Data Quality & Case Ascertainment

Case Ascertainment & Scottish Cancer Registry
Case ascertainment levels are assessed by comparing the number of new cases identified by Audit with those identified by Scottish Cancer Registry. Comparisons, however, are not straightforward but are subject to a small amount of variation. The 'year' in Audit is based on the date of diagnosis whereas cancer registration defines their cohort as the date the patient first became known to secondary healthcare. Cases that have been diagnosed in the private sector and have received any part of their treatment in NHS hospitals are included in audit.

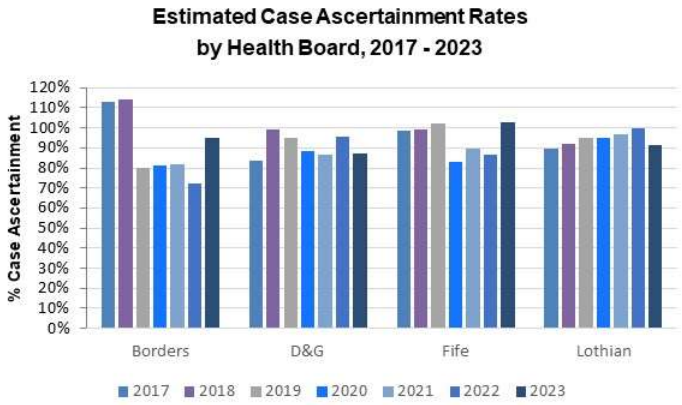
Estimated case ascertainment (ECA) is based on the most recent 5-year average available from Scottish Cancer Registry data and excludes death certificate only registrations.

Estimate of case ascertainment is calculated using the average of the most recent available 5 years of Cancer Registry data (2018-2022) and measured against the most recent year (2023) in audit.

	Borders	D&G	Fife	Lothian	SCAN
Number of cases in audit cohort	101	135	358	729	1323
Average from Cancer Registry (2018-2022)	106	155	348	799	1408
Estimated Case Ascertainment 2023	**95.3%**	**87.1%**	**102.9%**	**91.2%**	**94.0%**

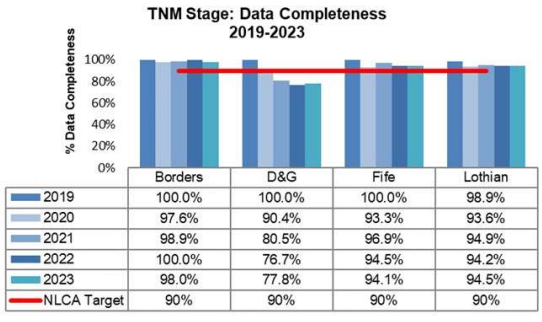
Source: Scottish Cancer Registry, PHS. Data extracted from ACaDMe: **31/10/2024**.

Historical case ascertainment results by HB are as follows:

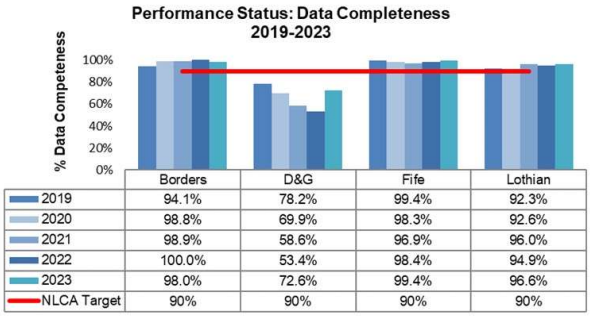


High levels of case ascertainment can provide confidence and contribute to the reliability of results presented, but only in part. The ECAs should also be viewed in conjunction with data completeness and the effects this can have on data outcomes.

Specific key categories endorse standards of care and drive improvements, for example: performance status (PS) and staging which are essential parameters in the selection of optimal treatment management and, which are important denominator-specific criteria for several QPIs, as are many other data items. It is vital that data are as complete as possible to ensure comprehensive and accurate QPI measurement.



	Borders	D&G	Fife	Lothian
2019	100.0%	100.0%	100.0%	98.9%
2020	97.6%	90.4%	93.3%	93.6%
2021	98.9%	80.5%	96.9%	94.9%
2022	100.0%	76.7%	94.5%	94.2%
2023	98.0%	77.8%	94.1%	94.5%
NLCA Target	90%	90%	90%	90%



	Borders	D&G	Fife	Lothian
2019	94.1%	78.2%	99.4%	92.3%
2020	98.8%	69.9%	98.3%	92.6%
2021	98.9%	58.6%	96.9%	96.0%
2022	100.0%	53.4%	98.4%	94.9%
2023	98.0%	72.6%	99.4%	96.6%
NLCA Target	90%	90%	90%	90%

While data completeness is acknowledged as necessary for all data items, the illustration above focuses only on PS and stage parameters.

There is not, however, a Scottish 'standard' to measure against but if we align with National Lung Cancer Audit (NLCA)[4], data completeness targets for staging and PS are recommended to be at least 90%.

[4] The NCLA analyses and reports on data in England & Wales, with submissions from Northern Ireland and Guernsey. Scotland no longer submits data due to QPI reporting methodology not being compatible with NLCA reporting.

Data completeness, overall, is generally good excepting NHS Dumfries & Galloway which is an outlier for both stage and PS. However, improvements which were introduced at MDT meetings are starting to show some progress in 2023 and it is anticipated that, as this practice embeds, performance will be of the same high standard across SCAN.

Completeness of data inspires greater confidence in the reliability of results and overall accuracy. Data completeness should be viewed as an additional measurement of confidence because it is based on the actual data collected and, when viewed together with high levels of case ascertainment demonstrates greater confidence in the reliability of results presented.

Quality Assurance
All hospitals participate in a Quality Assurance (QA) programme appraised by PHS to investigate the accuracy of recording of lung cancer data items which are used to report against national QPIs and, to highlight where data definitions may require further clarification. The most recent QA of lung data was carried out in August 2020: *Assessment of Lung Cancer QPI Dataset, Patients Diagnosed January to December 2018, Scotland Summary*. SCAN results are shown by health board below:

Performance by Health Board	Percent
Borders	97.1%
Dumfries and Galloway	95.8%
Fife	100.0%
Lothian	99.8%

All SCAN health boards exceeded the PHS recommended minimum standard of 90%.

Clinical Sign-off
This report compares current and historical data jointly and separately for each of the four SCAN Health Boards. The collated SCAN results are reviewed jointly by lead clinicians in SCAN to assess variances and provide comments on results as per the following processes:

- Individual health board results are reviewed and signed-off locally.
- Collated results were presented and discussed at the SCAN Regional Lung Cancer Sign off Meeting on 7th November 2024, at which point clinical recommendations were agreed.
- The final draft, complete with agreed amendments from the Sign-off meeting, was circulated to the SCAN Lung Group December 2024.
- The Final report was circulated to Clinical Governance Groups and SCAN Action Plan Board Leads January 2025.
- The report will be placed on the SCAN website once it has been fully signed-off and checked for disclosive material.

Actions for Improvement
Lung cancer teams in SCAN (clinicians, nursing and audit teams) work collaboratively to review data regularly to identify possible areas for improvement and to actively participate in driving improvements and, where appropriate, making changes to the ways care is delivered. Action plans and details of their progress are completed at health board level.

Acknowledgements
Thanks must go to the Lung Cancer Multi-Disciplinary Team: respiratory, radiology, pathology, cardiothoracic surgery consultants, the Edinburgh Cancer Centre consultant oncologists, the lung cancer nurse specialists' teams, and to audit colleagues for their collaborations and enthusiasm which have resulted in a very comprehensive report. For a full list of those who have contributed to this report, see appendix 6.

Key Categories

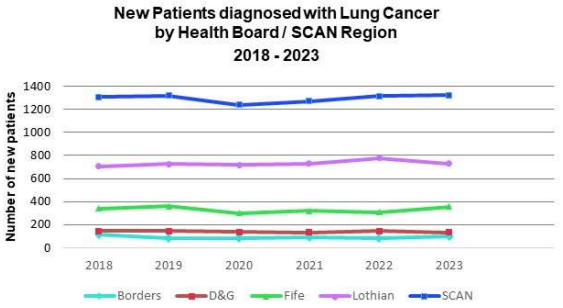
Whilst QPIs are fundamental to drive improvement in patients' pathways and outcomes, they are not the sole benchmark for measuring patient care. Key category data analyses enable additional perspective in the measurement of performance and should also be given due consideration. The SCAN Lung Group has endorsed that this report adopts a methodology which explores a selection of *key categories* alongside QPIs. Not only does this provide a more comprehensive analyses but also formulates improvement strategies for cancer services at health board level, and with particular attention to the Scottish Government's Cancer Strategy 2023-2033[5]; a strategy which sets out the vision to improve cancer survival and to provide excellent, equitably accessible care. Key data are illustrated below and additional tables and charts are provided in appendix 1.

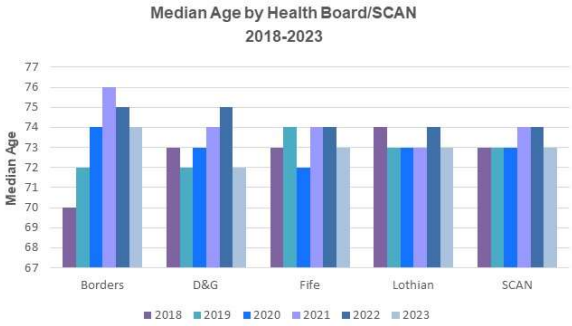
1. Demographics

In the most recent period (1st January to 31st December 2023) 1323 patients were diagnosed with lung cancer (ICD-codes: C33, C34) in the SCAN region; and by health board:

Patients diagnosed 01/01/2023 to 31/12/2023

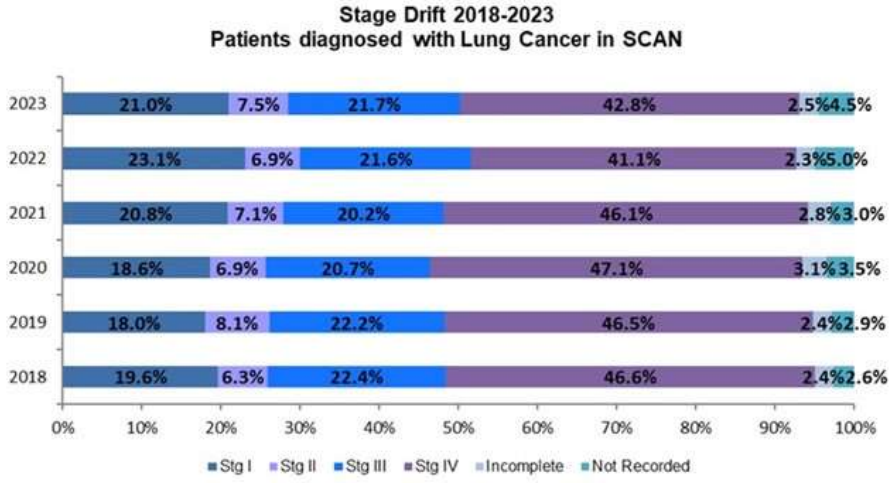
	Borders	D&G	Fife	Lothian	SCAN
Number of cases in audit cohort	**101**	**135**	**358**	**729**	**1323**
Male	52	66	150	330	598
Female	49	69	208	399	725
Median Age	74	72	73	73	73





2. Stage

Overall in SCAN region in 2023, almost 43% of patients with lung cancer presented with advanced (stage IV) disease (compared to almost 47% in 2018). Reassuringly, early stage presentation (stage I-II) has increased from 25.9% in 2018 to 28.5% in 2023.

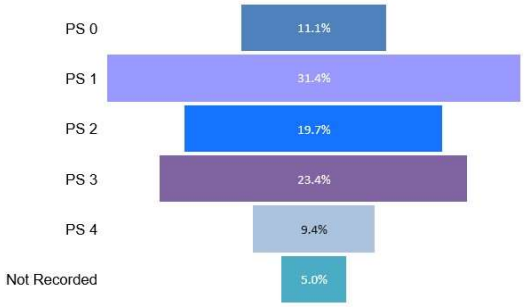


[5] Scottish Government (2023): *Cancer Strategy 2023-2022*. Cancer strategy 2023 to 2033 - gov.scot (www.gov.scot)

3. Performance Status

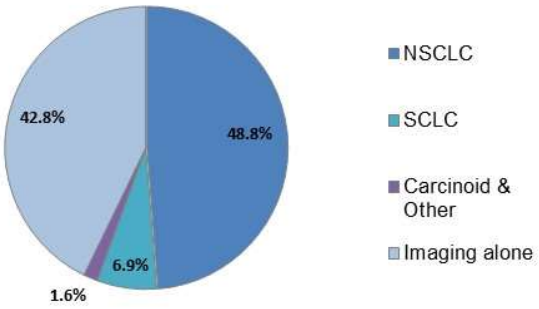
Performance status (PS) in conjunction with staging provide key parameters in determining optimal treatment options. Pre-treatment PS levels for 2023 are shown below.

WHO Performance Status (pre-treatment) SCAN 2023



4. Pathology

Lung Cancer SCAN 2023; n = 1323



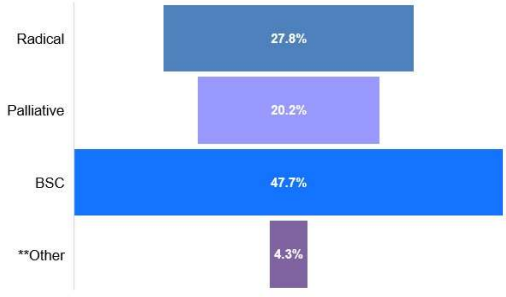
Pathology, SCAN 2023

NSCLC	
Squamous	161
Adenocarcinoma	422
NSCLC (NOS)	31
Other Specific NSCLC	26
Combination of NSCLC	5
SCLC	
SCLC	88
Mixed SCLC/NSCLC	3
OTHER	
Carcinoid	14
Cancer (NOS)	7

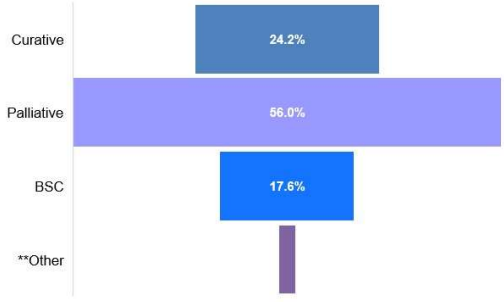
In 2023 almost 43% of patients were diagnosed by imaging alone which likely correlates to the advanced stage presentation of patients. These patients also tend to be frailer, likely PS3 or 4, and with higher levels of comorbid conditions. These patients usually cannot undergo invasive investigations, which come with a risk of harm, and which are additionally unlikely to improve outcomes for this vulnerable group.

5. Treatment Intent

***NSCLC, SCAN 2023**



SCLC, SCAN 2023



*NSCLC includes pathological and imaging diagnoses

** Other: W&W/Declined treatment/Died before treatment

** Other: W&W/Declined/Died before treatment = 2.2%

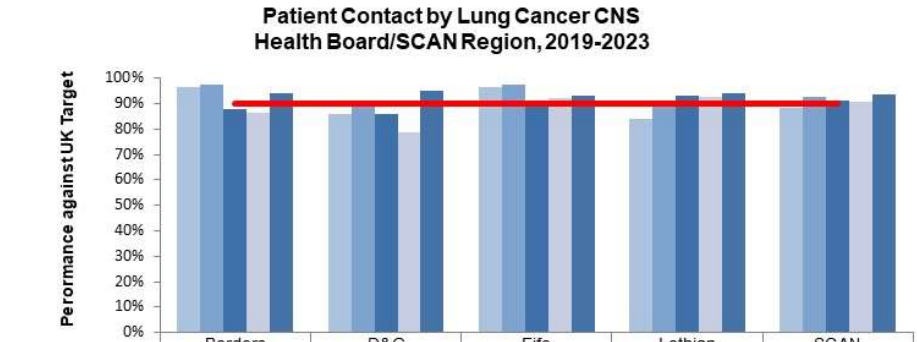
Curative treatment: surgery, radical radiotherapy and chemoradiotherapy
Palliative treatment: palliative radiotherapy, and palliative SACT which includes palliative chemotherapy, targeted therapy, immunotherapy and chemoimmunotherapy
BSC: Best Supportive care

Treatment by specific type (e.g. surgery, radical radiotherapy, palliative SACT, et cetera) can be found in appendix 1.

6. Lung Cancer Clinical Nurse Specialist Provision

In the absence of a specific QPI to measure performance levels for Lung Cancer Clinical Nurse Specialists (LCNS), reference is made to the National Lung Cancer Forum for Nurses (LCFN), the NLCA in England & Wales, and the National Institute for Health and Care Excellence (NICE). These organizations agree that a target of 90% is reasonable and, additionally NICE recommend that *every patient with suspected or confirmed lung cancer should have access to a lung cancer clinical nurse specialist at the time of and after diagnosis and, continued support throughout their pathway. The CNS facilitates communication between the secondary care team, the person's GP and the person with lung cancer*[6].

Results by health board for the most recent 5 years:



	Borders	D&G	Fife	Lothian	SCAN
2019	96.5%	85.7%	96.7%	83.7%	88.3%
2020	97.6%	89.7%	97.3%	91.0%	92.8%
2021	87.6%	85.7%	90.0%	92.9%	91.0%
2022	86.3%	78.8%	91.9%	92.7%	90.6%
2023	94.1%	94.8%	93.3%	93.8%	93.8%
NLCA Target	90%	90%	90%	90%	90%

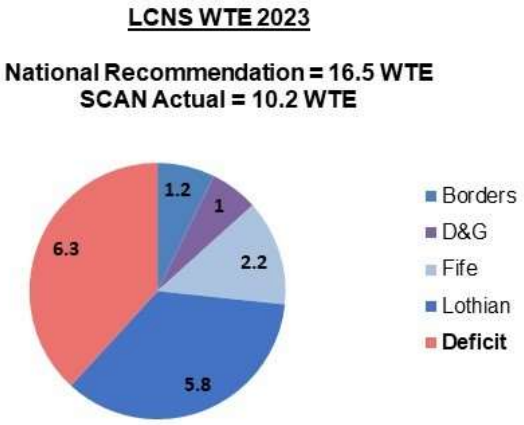
It is encouraging that new patients who have first-line treatment are well supported by LCNS as evidenced in the reassuringly high performance levels demonstrated above. It should also, however, be recognised that the workload of the LCNS extends beyond new patients and first-line treatments. Nurse-led clinics provide support before and after initial treatment, support for any subsequent treatments and additionally, the LCNS continues to monitor the high proportion of patients who are not suitable for active cancer treatment and instead are given ongoing supportive care.

Audit is currently unable to measure the 'full' activities and hard work of the LCNS staff and it is to their credit that, given workforce shortfalls, a deficit in resource and all associated challenges, that they endeavour to meet the demands of a busy service with the limited resources that are available to them.

The ratio of LCNS to patients has been found to be fundamental to optimal patient care. The United Kingdom Lung Cancer Coalition (UKLCC) *Scottish Pathways Matter*[7] was published in 2023. Nursing capacity is addressed under Recommendation 10 which focuses on workforce requirements. The recommendation goes on to specify that *this should include at least 1 whole-time equivalent (WTE) lung CNS per 80 new lung cancer patients to support patients on the pathway".*

[6] NICE (2019, updated 2023): *Lung Cancer: Diagnosis and Management [NG 122]* Lung cancer: diagnosis and management (nice.org.uk)
[7] UKLCC (2023): *Scottish Pathways Matter.* Scottish Pathways Matter | UKLCC

The UKLCC recommendation equates to an *ideal* of 16.5 WTE LCNS for SCAN based on the 2023 cohort (1323 patients). The actual current WTE falls well below this at 10.2 and represents a deficit of 6.3 WTE.



UKLCC recommendations across the four constituent health boards and by hospital in NHS Lothian, as compared to 'actual' WTE, are shown below.

Health Board	No. of Patients	Actual WTE	UKLCC Recommendation
Borders	101	1.2	1.26 WTE
D&G	135	1.0	1.69
Fife	358	2.2	4.47
Lothian	729	5.8	9.11

NHS Lothian comprises 3 main hospitals Royal Infirmary of Edinburgh (RIE), St John's Hospital, Livingston (SJH) and Western General Hospital in Edinburgh (WGH). There are 4 WTE CNS serving SJH & WGH and 1.8 WTE based at RIE.

NHS Lothian Hospitals	No. of Patients	Actual WTE	UKLCC Recommendation
RIE	275	1.8	3.4 WTE
SJH & WGH	454	4.0	5.6

Action: It is acknowledged that financial circumstances might inhibit immediate action but it is important to continue to draw attention to CNS resource deficits within the national agenda.

National UK Performance Indicators

An important benchmark for measuring patient care, in addition to key category analyses, is comparison with other parts of the UK. The NLCA produce annual reports for patients diagnosed with lung cancer in England and Wales. While Scotland had previously submitted data to NLCA pre-QPI, when measurement criteria were more similar, this discontinued when lung cancer QPIs were introduced in 2013 and measurement diverged to deliver on Scotland-specific challenges and objectives.

Now, for the first time, data analyses in SCAN have been expanded and based on an NLCA-type analyses of specific data. SCAN data has been analysed based on 6 NLCA-comparable categories[8]:

1. Proportion of patients with pathological diagnosis: Lung cancer, stage I/II, PS 0-1
2. Surgical resection for NSCLC (pathology & imaging) excluding SCLC & Carcinoid
3. NSCLC (pathology & imaging), stage I/II, PS 0-2 who have treatment with curative intent (surgery or radical radiotherapy)
4. NSCLC (pathology & imaging), stage IIIA, PS 0-2 who have treatment with curative intent (surgery, radical radiotherapy or chemoradiotherapy)
5. NSCLC (pathology & imaging), stage IIIB-IV, PS 0-1 who receive SACT
6. SCLC (limited & extensive disease) who receive chemotherapy.

The analyses cover the period from 2020 to 2023.

SCAN	Pathological Diagnosis Lung Cancer Stage I-II PS 0-1	Surgical Resection NSCLC[1] (Excl SCLC & Carcinoid)	Treatment with curative intent[2] NSCLC Stage I-II PS 0-2	Treatment with curative intent[3] NSCLC Stage IIIA PS 0-2	Systemic Anti-Cancer Treatment NSCLC Stage IIIB-IV PS 0-1	Chemotherapy SCLC All Stages
Target[4]	90%	17%	80%	n/a	70%	70%
2023	**73.5%** (133/181)	**10.3%** (125/1217)	**77.7%** (209/269)	**67.6%** (43/66)	**69.8%** (176/252)	**70.0%** (63/90)
2022	**75.4%** (141/187)	**12.1%** (143/1179)	**77.8%** (221/284)	**75.8%** (47/62)	**62.4%** (153/245)	**56.8%** (67/118)
2021	**77.2%** (132/171)	**12.5%** (145/1161)	**78.2%** (205/262)	**64.9%** (48/74)	**57.3%** (134/234)	**64.5%** (69/107)
2020	**80.0%** (136/170)	**13.5%** (151/1117)	**84.4%** (200/237)	**64.7%** (44/68)	**60.7%** (142/234)	**51.9%** (55/106)

[1] NSCLC across all categories includes pathological and imaging diagnoses
[2] Curative Treatment includes surgery or radical radiotherapy
[3] Curative Treatment includes surgery, radical radiotherapy or chemoradiotherapy
[4] Targets are based on NLCA targets

[8] Categories aligned with NLCA Report 2024 www.lungcanceraudit.org.uk/reports-publications/nlca-state-of-the-nation-2024/

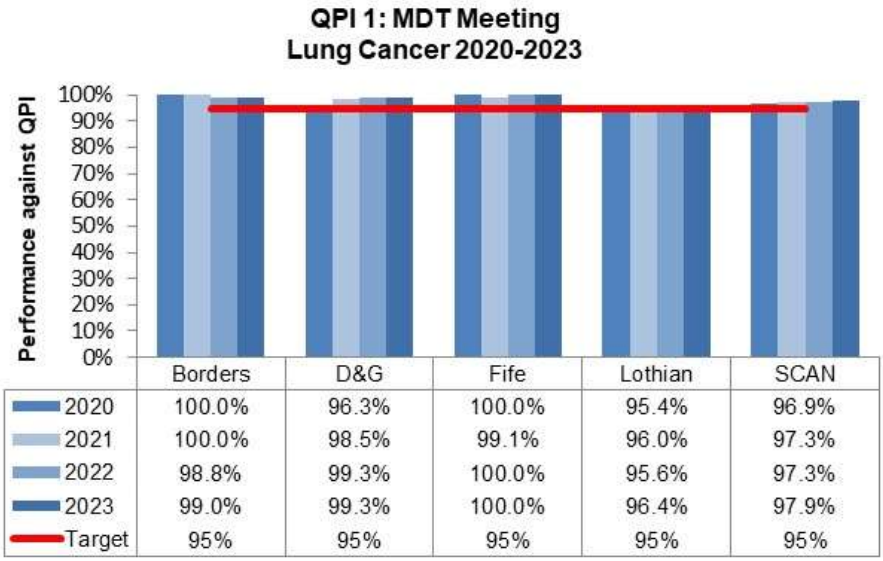
Quality Performance Indicators
Diagnosis and Staging Investigations

QPI 1 Multi-disciplinary Team (MDT) Meeting — Target = 95%

Numerator = Number of patients with lung cancer discussed at MDT.
Denominator = All patients with lung cancer (no exclusions).

Target 95%	Borders	D&G	Fife	Lothian	SCAN
2023 cohort	101	135	358	729	1323
Ineligible for this QPI*	0	0	0	0	0
Numerator	100	134	358	703	1295
Not recorded for numerator	1	0	0	0	1
Denominator	101	135	358	729	1323
Not recorded for denominator	0	0	0	0	0
Not recorded for exclusions	0	0	0	0	0
% Performance	**99.0%**	**99.3%**	**100.0%**	**96.4%**	**97.9%**

* The total number of *ineligible* refers to patients who do not meet the denominator criteria PLUS patients belonging to the exclusions category. For this QPI *all* patients meet the denominator criteria therefore no ineligible category patients exist.



	Borders	D&G	Fife	Lothian	SCAN
2020	100.0%	96.3%	100.0%	95.4%	96.9%
2021	100.0%	98.5%	99.1%	96.0%	97.3%
2022	98.8%	99.3%	100.0%	95.6%	97.3%
2023	99.0%	99.3%	100.0%	96.4%	97.9%
Target	95%	95%	95%	95%	95%

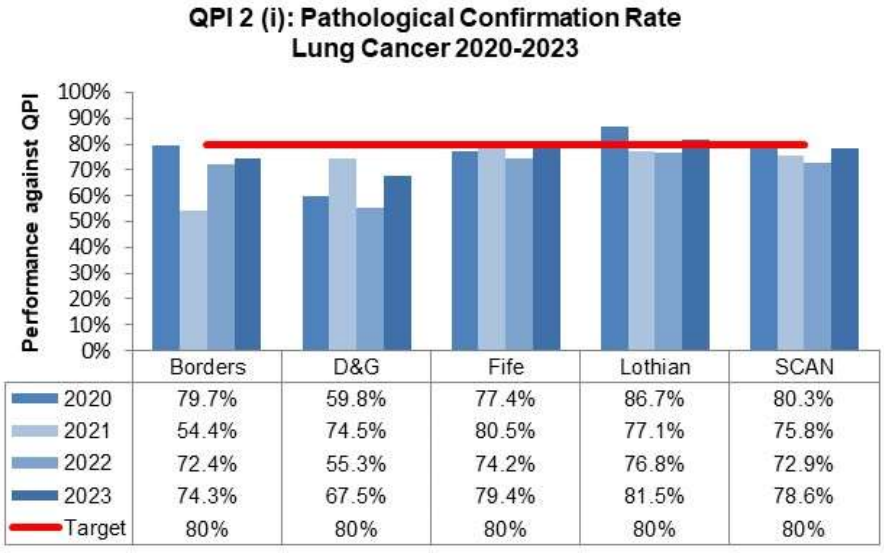
Comment
The QPI was passed by all health boards in the SCAN region in 2023 and no action is required.

QPI 2 Pathological Diagnosis

2 (i) Pathological Diagnosis of Lung Cancer **Target = 80%**

Numerator = Number of patients with lung cancer who have a pathological diagnosis (including following surgical resection).
Denominator = All patients with lung cancer.
Exclusions = Patients who decline investigations or surgical resection and patients with performance status 3 or 4.

Target 80%	Borders	D&G	Fife	Lothian	SCAN
2023 cohort	101	135	358	729	1323
Ineligible for this QPI (exclusions only)	31	21	178	263	493
Numerator	52	77	143	380	652
Not recorded for numerator	0	0	0	0	0
Denominator	70	114	180	466	830
Not recorded for denominator	0	0	0	0	0
Not recorded for exclusions (PS not recorded)	2	34	2	20	58
% Performance	**74.3%**	**67.5%**	**79.4%**	**81.5%**	**78.6%**



Comment
This QPI continues to be challenging year on year. More advanced diagnostics correspond to more CT scans than before and to more (often small and/or inaccessible) nodules being identified; many of which can be challenging to biopsy (size and location). At the other end of the spectrum are those patients who present with advanced disease (in SCAN 42.8% reported as stage IV with an additional 7% with stage not recorded or incomplete) and/or poor fitness (PS3/4 in SCAN region accounts for 33% of patients and 5% with PS not recorded) and/or comorbid conditions.

In 2023, however, slight improvement has been demonstrated by NHS Lothian, who only just exceeded the target (by 1.5%), while it was narrowly missed by NHS Fife showing a shortfall of only 0.6% (37 cases). NHS Borders had a shortfall of 5.7% (18 cases) and Dumfries & Galloway a larger shortfall of 12.5% (37 cases).

Higher case ascertainment generally corresponds to a higher number of frailer and more advanced disease patients with higher levels of comorbid conditions. Interestingly, case ascertainment in NHS Borders rose from 72.1% in 2022 to an impressive 95.3% in 2023. As expected, investigation of Borders' outliers demonstrated poor fitness and/or comorbidities as the most prevalent reasons why tissue was not pursued.

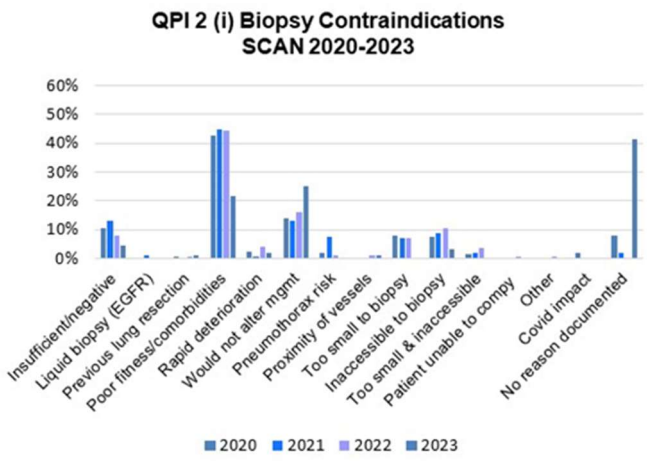
Conversely the shortfall in NHS Dumfries & Galloway might be a consequence of the higher level of "not recorded for exclusion" (34 cases) which accounts for 29.8% of eligible patients (i.e. of the denominator = 114).

Where PS is 'unknown' it is not possible to determine whether these patients should or should not be included in the analysis. QPI reporting guidance states that these 'unknowns' have to be *included in the denominator for measurement against the target UNLESS there is other definitive evidence that the record should be excluded.* This means that when performance status is not recorded, we may inappropriately include some patients in the denominator instead of placing into the exclusions group (i.e. those who are too frail (PS 3 or 4) to have a biopsy) and as such this may cause performance to fall short; and likely has been demonstrated by D&G.

Following on from an action in last year's report, a more robust recording process is now in place in NHS Dumfries & Galloway and it is expected there will be more complete PS recording going forward. It is anticipated that this will impact positively on next year's results.

Potential reasons for a lack of pathological diagnoses for outliers in NHS Borders, Dumfries & Galloway, and Fife have been individually reviewed and are illustrated below alongside an overall review for SCAN from 2020 to present:

Outliers 2023	Borders	D&G	Fife
ATTEMPTED/OTHER PATHOLOGY			
Insufficient/Negative	-	-	4
Previous lung resection	-	-	1
PATIENT FITNESS			
Poor fitness/comorbidity	15	-	5
Rapid deterioration	1	-	1
Would not alter management		-	23
TECHNICAL REASONS			
Pneumothorax risk	-	-	-
Hig risk: close to vessels	-	-	1
Too small	-	-	-
Inaccessible	2	-	1
Too small & inaccessible	-	-	-
Pt unable to comply with instructions	-	-	-
No reason documented	-	37	1
TOTALS	18	37	37



In most cases valid clinical reasons have been identified. Additionally, the outcome of last year's action plan is expected to drive improvements more particularly in the recording of performance status by the MDT. A further development, which is expected to impact on results, is the use of more advanced bronchoscopy methods which should correlate with a greater number of lesions being accessible to biopsy.

Sometimes it is not appropriate to pursue pathology for lung cancer patients. Previous detailed reviews of SCAN data[9] have shown there exists a group of patients who cannot undergo invasive investigations due to poor fitness levels and/or comorbidities and sadly, for whom treatment choices can be limited. Invasive procedures, with a risk of harm (e.g. bleeding, pneumothorax) have been shown not to improve outcomes for this vulnerable group. It is in this context we should view this QPI; so that we do not strive to attain targets which might drive clinically inappropriate or potentially unsafe outcomes for patients; which additionally are redundant when pathology would not influence or alter clinical management or patient outcomes. No further action is required at this time.

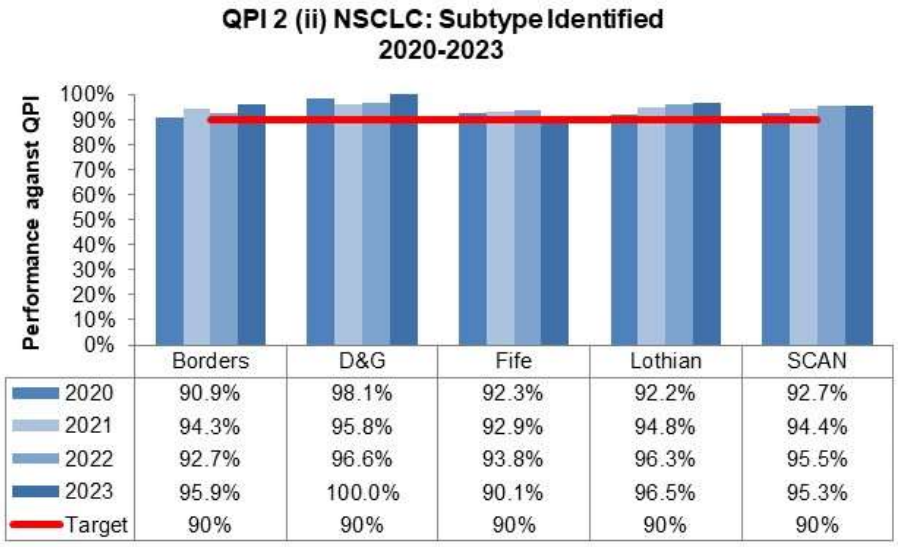
[9] Bain L et al, 2020: *Lung Cancer Patients Without Tissue Diagnosis in NHS Lothian 2016 – 2018*. (2020 Lung Cancer QPI Report) (www.scan.scot.nhs.uk).

2 (ii) Pathological Diagnosis of NSCLC: Sub-type Identified Target = 90%

Numerator = Number of patients with a pathological diagnosis of Non-Small Cell Lung Cancer (NSCLC) who have a tumour sub-type identified[10]
Denominator = All patients with a pathological diagnosis of NSCLC (no exclusions).

Target 90%	Borders	D&G	Fife	Lothian	SCAN
2023 cohort	101	135	358	729	1323
Ineligible for this QPI*	52	63	206	355	676
Numerator	47	72	137	359	615
Not recorded for numerator	0	0	0	0	0
Denominator	49	72	152	372	645
Not recorded for denominator	0	0	0	2	2
Not recorded for exclusions	0	0	0	0	0
% Performance	**95.9%**	**100.0%**	**90.1%**	**96.5%**	**95.3%**

* The total number of *ineligible* refers to patients who do not meet the denominator criteria PLUS patients belonging to the exclusions category. For this QPI, patients who do NOT meet the denominator criteria belong to one of the following ineligible categories: patients with a diagnosis of SCLC, carcinoid or 'other' malignancies and to those with an imaging diagnosis. In this instance no exclusions exist.



	Borders	D&G	Fife	Lothian	SCAN
2020	90.9%	98.1%	92.3%	92.2%	92.7%
2021	94.3%	95.8%	92.9%	94.8%	94.4%
2022	92.7%	96.6%	93.8%	96.3%	95.5%
2023	95.9%	100.0%	90.1%	96.5%	95.3%
Target	90%	90%	90%	90%	90%

Comment

The QPI was passed by all health boards in the SCAN region in 2023 and, has been consistently met over the last 4 years. Improved immunochemistry methods in pathological diagnostics result in fewer "not otherwise specified" (NOS) rates and in better sub-typing, the latter being a requirement for oncogenic mutation profiling or PDL1 testing which enables patient-targeted treatments.

Action: Formal Review Cycle 3 with a view to archiving.

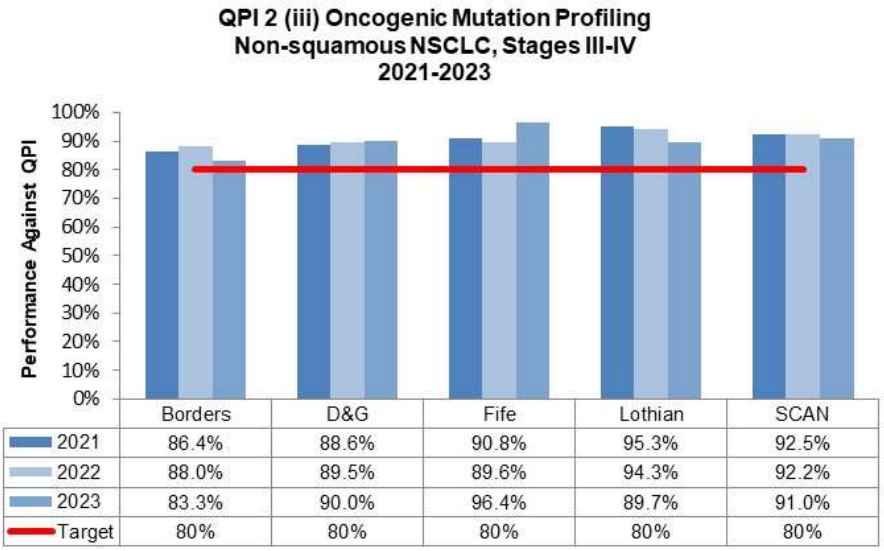
[10] NSCLC sub types = Squamous, Adenocarcinoma, Other Specific NSCLC and Combination of non-small cell components, i.e. does not include NSCLC (NOS), as specified in *Lung Cancer Measurability of Quality Performance Indicators, Version 4.0*: ISD Scotland: January 2020.

QPI 2 (iii) Non-Squamous, Stage IIIB to IV: Molecular Profiling Analyses Target 80%

Numerator = Number of patients with a pathological diagnosis of stage III-IV non-squamous NSCLC who have oncogenic mutation profiling undertaken.
Denominator = All patients with a pathological diagnosis of stage III-IV non-squamous NSCLC.
Exclusions = Patients with performance status 4.

Target 80%	Borders	D&G	Fife	Lothian	SCAN
2023 cohort	101	135	358	729	1323
Ineligible for this QPI*	76	89	273	539	977
Numerator	20	36	80	166	302
Not recorded for numerator	0	0	0	0	0
Denominator	24	40	83	185	332
Not recorded for denominator	1	6	2	5	14
Not recorded for exclusions**	0	6	0	4	10
% Performance	**83.3%**	**90.0%**	**96.4%**	**89.7%**	**91.0%**

* The total number of *ineligible* refers to patients who do not meet the denominator criteria PLUS patients belonging to the exclusions category. For this QPI, patients who do NOT meet the denominator criteria belong to one of the following ineligible categories: patients with a diagnosis of SCLC, squamous, carcinoid or 'other' malignancies; patients with an imaging diagnosis; and patients with stage I-II non-squamous NSCLC. Exclusions are patients reported as PS4.
** Not recorded for exclusions are those patients where PS was not documented.



	Borders	D&G	Fife	Lothian	SCAN
2021	86.4%	88.6%	90.8%	95.3%	92.5%
2022	88.0%	89.5%	89.6%	94.3%	92.2%
2023	83.3%	90.0%	96.4%	89.7%	91.0%
Target	80%	80%	80%	80%	80%

Comment

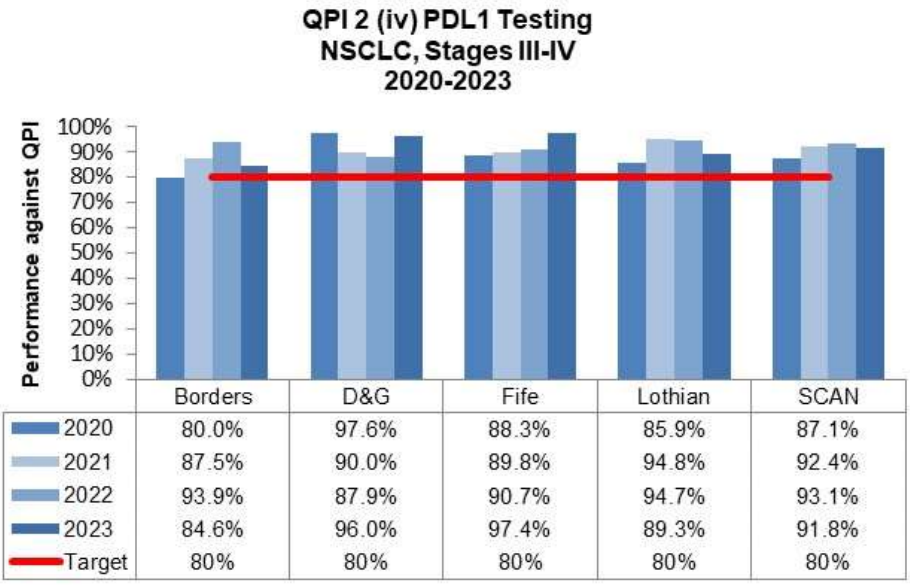
The QPI was passed by all health boards in the SCAN region in 2023 and has been consistently met year on year. Continued reporting would be redundant and therefore is no longer required.

Action: Formal Review Cycle 3 with a view to archiving.

QPI 2 (iv) PDL1 Testing for patients diagnosed with NSCLC, Stages III-IV Target 80%

Numerator = Number of patients with a pathological diagnosis of stage III-IV NSCLC who have PDL1 testing undertaken.
Denominator = All patients with a pathological diagnosis of stage III-IV NSCLC.
Exclusions = Patients with performance status 4.

Target 80%	Borders	D&G	Fife	Lothian	SCAN
2023 cohort	101	135	358	729	1323
Ineligible for this QPI	61	78	240	478	857
Numerator	33	48	113	218	412
Not recorded for numerator	0	0	0	0	0
Denominator	39	50	116	244	449
Not recorded for denominator	1	7	2	7	17
Not recorded for exclusions	0	7	0	4	11
% Performance	**84.6%**	**96.0%**	**97.4%**	**89.3%**	**91.8%**



	Borders	D&G	Fife	Lothian	SCAN
2020	80.0%	97.6%	88.3%	85.9%	87.1%
2021	87.5%	90.0%	89.8%	94.8%	92.4%
2022	93.9%	87.9%	90.7%	94.7%	93.1%
2023	84.6%	96.0%	97.4%	89.3%	91.8%
Target	80%	80%	80%	80%	80%

Comment
The QPI was passed by all health boards in the SCAN region in 2023 and is consistently passed year on year. Continued reporting would be redundant and therefore is no longer required.

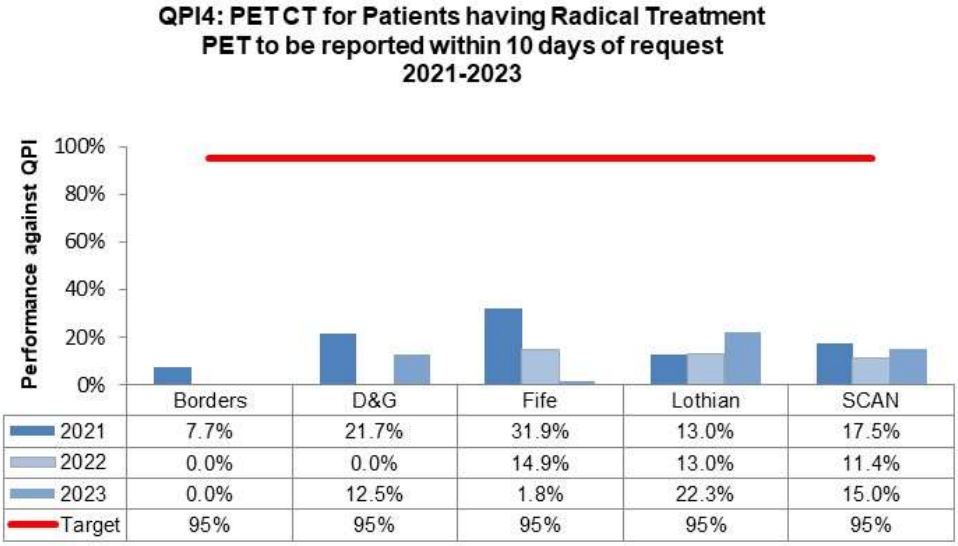
Action: Formal Review Cycle 3 with a view to archiving.

QPI 3 Bronchoscopy
At Formal Review 1, QPI 3 was deemed redundant and archived; and is no longer reported.

QPI 4 Patients having Radical Treatment: PET CT Reported within 10 Days Target 95%

Numerator = Number of patients with NSCLC who receive curative treatment (surgical resection, chemoradiotherapy or radical radiotherapy) that undergo PET (Positron Emission Tomography) CT prior to start of treatment where the report is available within 10 days of radiology request.
Denominator = All patients with NSCLC who receive curative treatment (surgical resection, radical chemoradiotherapy or radical radiotherapy) that undergo PET CT prior to start of treatment (no exclusions).

Target 95%	Borders	D&G	Fife	Lothian	SCAN
2023 cohort	101	135	358	729	1323
Ineligible for this QPI	82	110	302	578	1072
Numerator	0	3	1	33	37
Not recorded for numerator	0	0	2	0	2
Denominator	19	24	55	148	246
Not recorded for denominator	0	1	1	3	5
Not recorded for exclusions	0	0	0	0	0
% Performance	**0.0%**	**12.5%**	**1.8%**	**22.3%**	**15.0%**



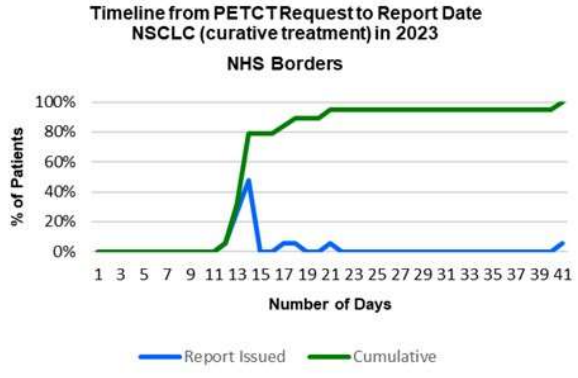
	Borders	D&G	Fife	Lothian	SCAN
2021	7.7%	21.7%	31.9%	13.0%	17.5%
2022	0.0%	0.0%	14.9%	13.0%	11.4%
2023	0.0%	12.5%	1.8%	22.3%	15.0%
Target	95%	95%	95%	95%	95%

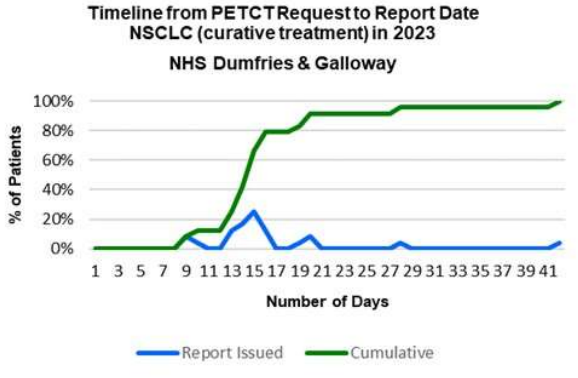
Comment

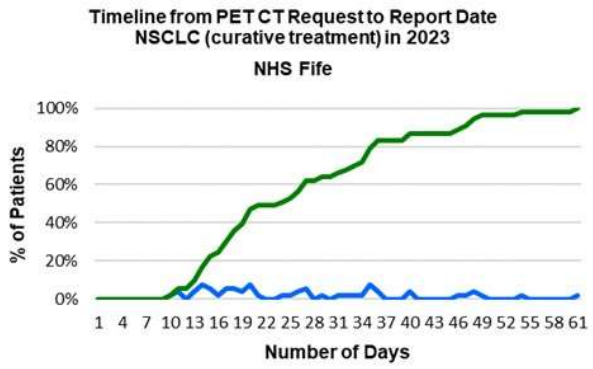
This QPI has not been met by any SCAN health board for any of the three years of reporting PET CT within a designated time scale, i.e. within 10 'actual' days. Review, however, indicates that patients do have appropriate imaging but that the PET CT is often reported *more than* 10 days after the radiology request.

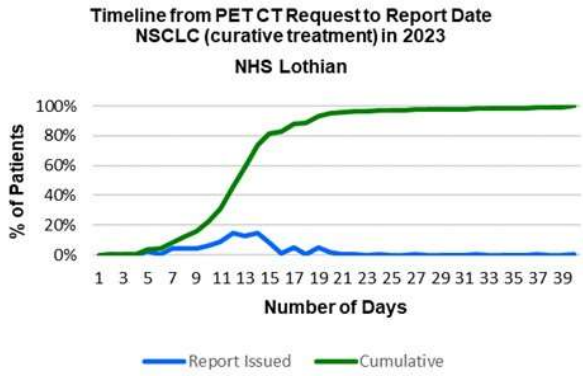
Although results appear disappointing it should be noted that the number of days taken is generally not linear and that a rapid rise is apparent between 2 and 3 weeks and that most patients have a PET result within 3 weeks of request:

Number of Days from PET Request to Report by NHS Board

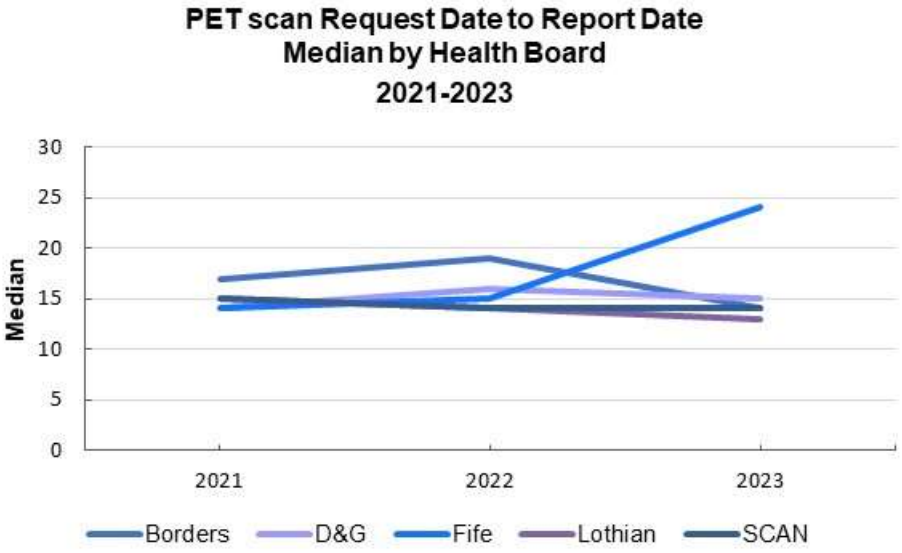








Timeline results in Fife in 2023 do not demonstrate the rapid rise as evidenced in the other health boards and indeed the median for Fife is slightly surprising as illustrated below. The median number of days from PET CT request to reporting in SCAN over the past 3 years is shown below:



While the majority of PET facilities for patients diagnosed in SCAN are based in Edinburgh, patients from Fife are generally referred to Ninewells Hospital, Dundee. Anecdotally, this might explain why Fife is an outlier compared to the other SCAN health boards but more investigation would be required to confirm or otherwise. NHS Fife cancer management have raised PET capacity issues directly with the Scottish Government.

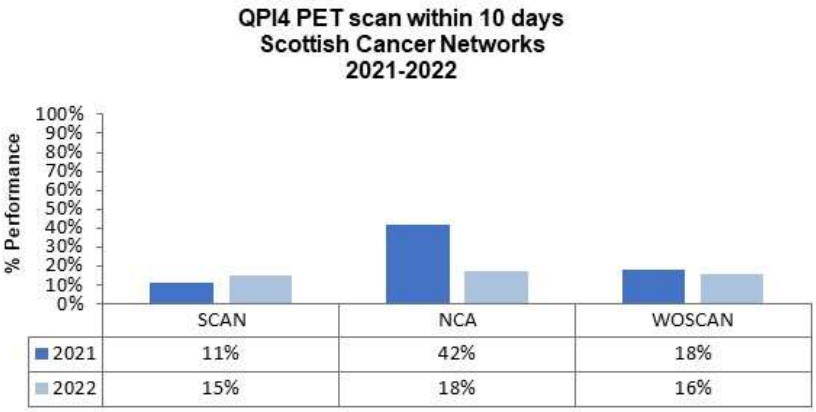
It is important that patients who require urgent PET scans should be acted on straightaway rather than being placed on waiting lists alongside patients with less urgent need but more work is required to address concerns and drive improvement in performance.

A pilot commenced in December 2023 at Western General Hospital in Edinburgh, and scheduled PET CT scans coincide with respiratory clinics so that patients with locally advanced disease, more especially where mediastinal staging will affect treatment choices, will receive PET CT the following day (2 pre-booked scan slots have been made available); then followed by EBUS early the following week (after dual reporting of PET). It is anticipated that the pilot will demonstrate improvement and that this approach can be rolled out to other hospitals and health boards in SCAN so that improvement in performance might be expected in subsequent years. A similar approach has been

adopted by WOSCAN with protected PET CT slots made available and rolled out to all health boards in their region[11].

The 3 Scottish cancer networks (SCAN, NCA (North Cancer Alliance) & WOSCAN (West of Scotland Cancer Network)) have similar challenges in meeting this QPI: the overwhelming lack of capacity of PET scanners; the often poor availability of radio isotopes or tracers, most commonly FDG (F-fluorodeoxyglucose); workforce resource limitations; competing pressures on the PET service from specialties other than lung cancer; and that PET CT is additionally required to assess patients for many second-line oncology treatment for lung cancer progressive disease.

Scotland's comparative results for 2021-2022[12] for the 3 Scottish Cancer Networks are as follows:



	SCAN	NCA	WOSCAN
2021	11%	42%	18%
2022	15%	18%	16%

Results are broadly similar with the exception of NCA results in 2021. Of note is that NCA is a network predisposed to smaller peripheral island health boards (i.e. Orkney, Shetland and Western Isles) which have smaller cohorts. A consequence of small numbers is that they can manifest disproportionately higher percentage outcomes and therefore it is advisable to view these results with a degree of caution. Aggregation of results over time helps to clarify outcomes where numbers are small and variation may be due to chance.

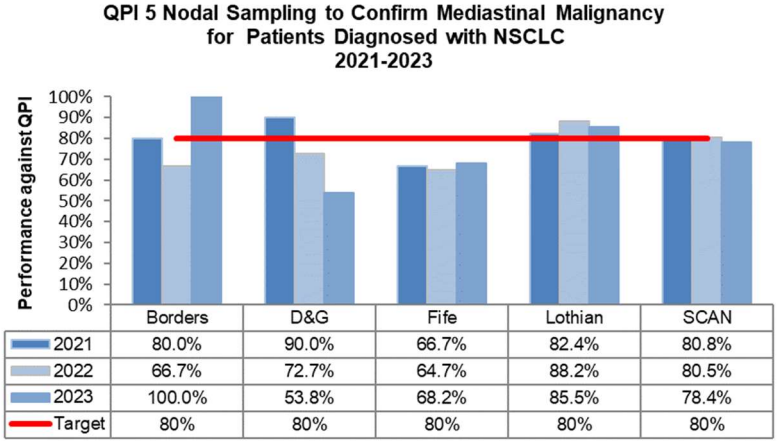
[11] West of Scotland Cancer Network, Lung Cancer Managed Clinical Network: *Audit Report: Lung Quality Performance Indicators. Clinical Audit Data: 01 January 2022 to 31 December 2022.* https://www.woscan.scot.nhs.uk/wp-content/uploads/Final_Lung-Cancer-QPI-Audit-Report-V1.0_231123.pdf

[12] 2021-2022 are published on NCA FINAL Lung Annual Report 2022 Patients_NCA Website.pdf & WOSCAN Reports and Publications – West of Scotland Cancer Network websites. Scotland-wide results have not yet been published for patients diagnosed in 2023.

QPI 5 Patients with Nodal Spread on PET CT should undergo Nodal Sampling Target 80%

Numerator = Number of patients with NSCLC undergoing treatment with curative intent (surgical resection, chemoradiotherapy or radical radiotherapy) who have a PET CT scan that shows enlarged or positive hilar (N1/N3), mediastinal (N2/N3) or SCF[13] nodes (N3), that have invasive nodal staging (assessment /sampling) performed[14] and nodes sampled.
Denominator = All patients with NSCLC undergoing treatment with curative intent (surgical resection, chemoradiotherapy or radical radiotherapy) who have a PET CT scan that shows enlarged or positive hilar (N1/N3), mediastinal (N2/N3) or SCF nodes (N3).
Exclusions = Patients with stage IV[15] disease or who decline investigation.

Target 80%	Borders	D&G	Fife	Lothian	SCAN
2023 cohort	101	135	358	729	1323
Ineligible for this QPI	94	122	336	674	1226
Numerator	7	7	15	47	76
Not recorded for numerator	0	0	0	0	0
Denominator	7	13	22	55	97
Not recorded for denominator	0	0	0	0	0
Not recorded for exclusions	0	1	1	0	2
% Performance	**100.0%**	**53.8%**	**68.2%**	**85.5%**	**78.4%**



	Borders	D&G	Fife	Lothian	SCAN
2021	80.0%	90.0%	66.7%	82.4%	80.8%
2022	66.7%	72.7%	64.7%	88.2%	80.5%
2023	100.0%	53.8%	68.2%	85.5%	78.4%
Target	80%	80%	80%	80%	80%

Comment

Full and complete staging is an important requirement which informs oncology treatment intent decisions, i.e. radical versus palliative. The target was not met in NHS Dumfries &Galloway or Fife in 2023 with respective shortfalls of 26.2% (6 cases) and 11.8% (7 cases). However, the impact of small numbers on results should also be acknowledged.

Reasons Nodal Sampling was not undertaken	D&G	Fife
EBUS would not alter management	1	3
N1 node status would not alter radical radiotherapy field	-	3
EBUS of lung mass but no nodal sampling	-	1
Failed EBUS, not appropriate to repeat	2	-
No reason documented	3	-
TOTALS	6	7

All outliers represent valid clinical reasons though shortfalls do require further clarification. Improvements are anticipated in Dumfries & Galloway where local EBUS procedures are expected to commence early 2025. In Fife in 2023, delays in PET scan availability prompted having EBUS prior to PET. A further delay in repeating EBUS (1-2 weeks) was deemed inappropriate and would not have altered treatment management given the information received at initial EBUS.

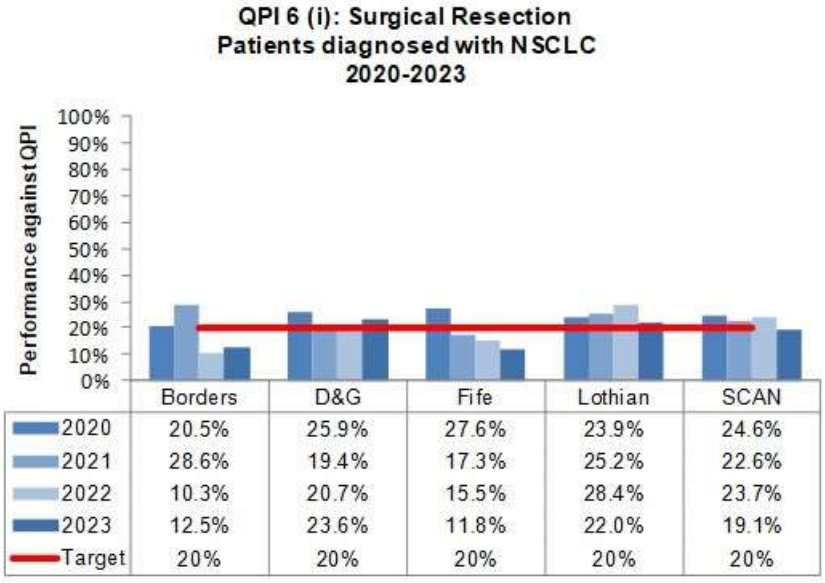
[13] SCF: Supraclavicular Fossa
[14] Methods of sampling include Neck US guided or direct biopsy (core or FNA), EBUS, EUS-B, EUS, mediastinoscopy or VATS (Video-Assisted Thoracoscopic Surgery).
[15] Stage IV: M1, M1a, M1b, or M1c disease.

Treatment Management

QPI 6 Surgical Resection in Non-Small Cell Lung Cancer
6 (i) NSCLC and Surgical Resection **Target = 20%**

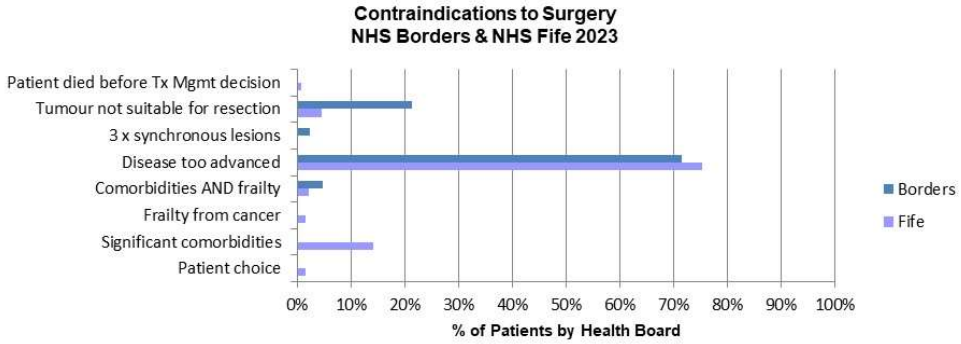
Numerator = Number of patients with NSCLC who undergo surgical resection.
Denominator = All patients with NSCLC.
Exclusion = Patients who die before surgery.

Target 20%	Borders	D&G	Fife	Lothian	SCAN
2023 cohort	101	135	358	729	1323
Ineligible for this QPI	53	63	206	357	679
Numerator	6	17	18	82	123
Not recorded for numerator	0	0	0	0	0
Denominator	48	72	152	372	644
Not recorded for denominator	0	0	0	0	0
Not recorded for exclusions	0	0	0	2	2
% Performance	**12.5%**	**23.6%**	**11.8%**	**22.0%**	**19.1%**



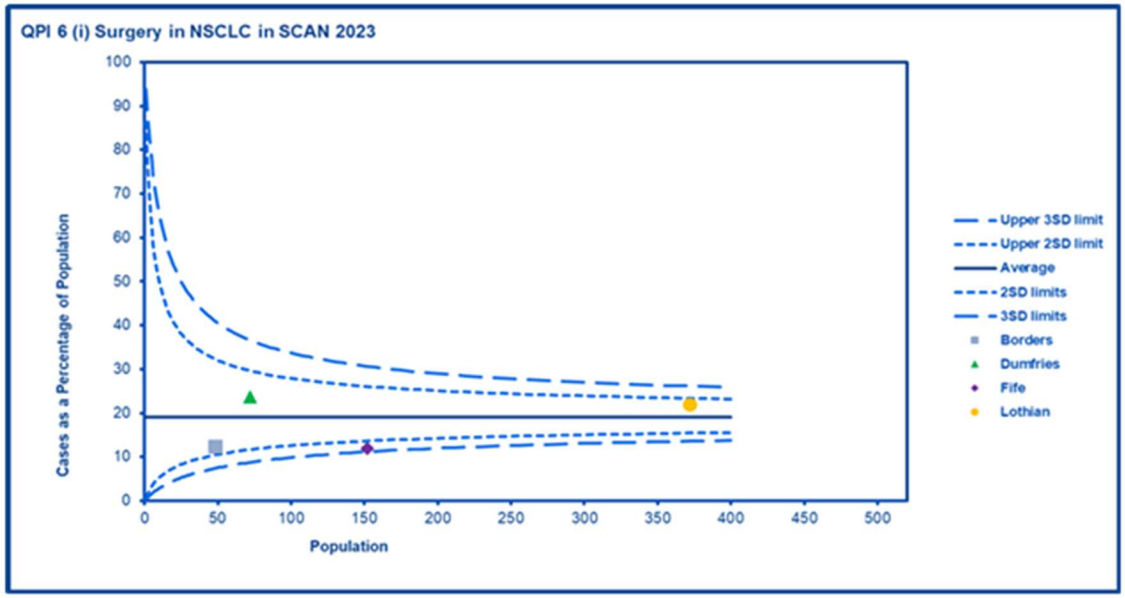
Comment

This QPI was passed by NHS D&G and NHS Lothian. The target fell short in NHS Borders with a shortfall of 7.5% (42 cases) and 8.2% (134 cases) in NHS Fife. The tolerance level within this target accounts for the fact that not all patients are suitable for surgical resection due to extent of disease, for example, patients with stages IIIA-B do not have a surgical option but are radically treatable with chemoradiotherapy. Other patients with more advanced disease, and/or poor fitness or comorbidities are offered oncology treatment or supportive care options on a patient-by-patient basis.



The variation between health boards was found to be generally within accepted standard deviation limits which indicate that performance is not significantly different from the benchmark, or average, and that no further action is required.

QPI 6i: Funnel Plot 2023



Anything outwith the funnel points would be regarded as 'special cause' variation which generally warrants further investigation. NHS Fife sits on the boundary of the lower control limit, lying just within 'common cause' variation and, while not of great concern, this does merit some comment. This QPI incorporates *all* NSCLC patients regardless of stage. In Fife, almost 70% of patients presented with stage III or IV disease, of which 52% presented as stage IV[16]. The main contraindication to surgery for patients from NHS Fife was overwhelmingly where disease was too advanced and it is understandable that these patients would not be suitable for surgical resection.

Lung cancer surgery includes pneumonectomy, lobectomy, segmentectomy, and wedge resection; with wedge procedures kept to a minimum. Any patients referred for surgical resection that are only suitable for wedge resection should be re-evaluated. The patient should be referred back to the MDT and alternative and less invasive radiotherapy treatment, i.e. SABR, should be considered. Additionally, patients considered borderline for surgery due to poor fitness or comorbid conditions might be better suited to SABR or conventional radical radiotherapy.

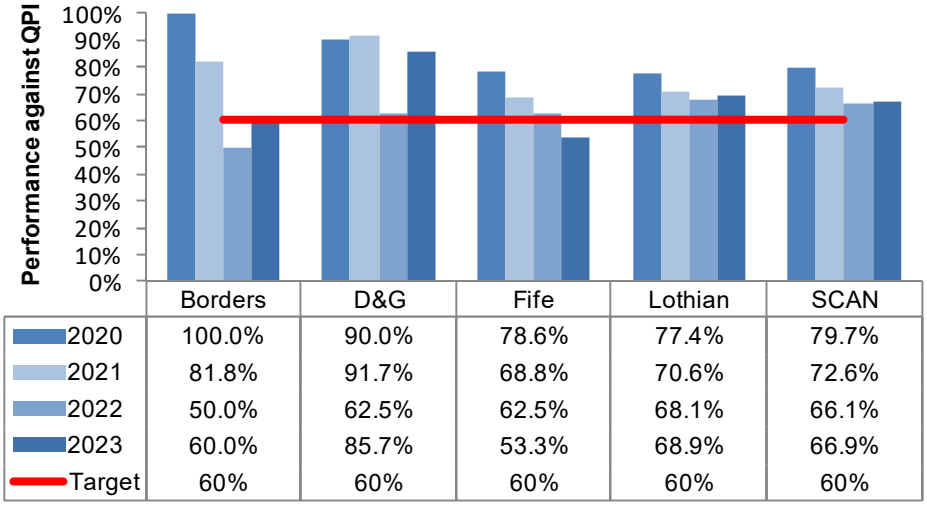
[16] See Appendix 1: Stage distribution at presentation by NSCLC, SCLC & imaging diagnoses by SCAN health board.

6 (ii) NSCLC, Stage I-II and Surgical Resection — Target = 60%

Numerator = Number of patients with NSCLC, Stage I-II[17] who undergo surgical resection.
Denominator = All patients with NSCLC, Stage I-II only.
Exclusion = Patients who die before surgery.

Target 60%	Borders	D&G	Fife	Lothian	SCAN
2023 cohort	101	135	358	729	1323
Ineligible for this QPI	91	114	327	620	1152
Numerator	6	12	16	71	105
Not recorded for numerator	0	0	0	0	0
Denominator	10	14	30	103	157
Not recorded for denominator	0	7	1	6	14
Not recorded for exclusions	0	0	0	0	0
% Performance	**60.0%**	**85.7%**	**53.3%**	**68.9%**	**66.9%**

QPI 6 (ii): Surgical Resection
Patients diagnosed with NSCLC, Stages I-II
2020-2023



	Borders	D&G	Fife	Lothian	SCAN
2020	100.0%	90.0%	78.6%	77.4%	79.7%
2021	81.8%	91.7%	68.8%	70.6%	72.6%
2022	50.0%	62.5%	62.5%	68.1%	66.1%
2023	60.0%	85.7%	53.3%	68.9%	66.9%
Target	60%	60%	60%	60%	60%

Comment

The target was missed in NHS Fife with a shortfall of 6.7% (14 cases). Of the patients unable to have surgery, the majority were due to patient frailty or comorbidities. One patient declined surgery in favour of less invasive oncological radical treatment. All are conducive to valid clinical reasons and no action is required.

[17] Stage I-II: T1 (mi) or T1 or T1a-1c N0 M0; or T2 or T2b N0 M0; or T1a-c or T2a-b N1 M0; or T3N0M0.

QPI 7 Lymph Node Assessment Target = 80%

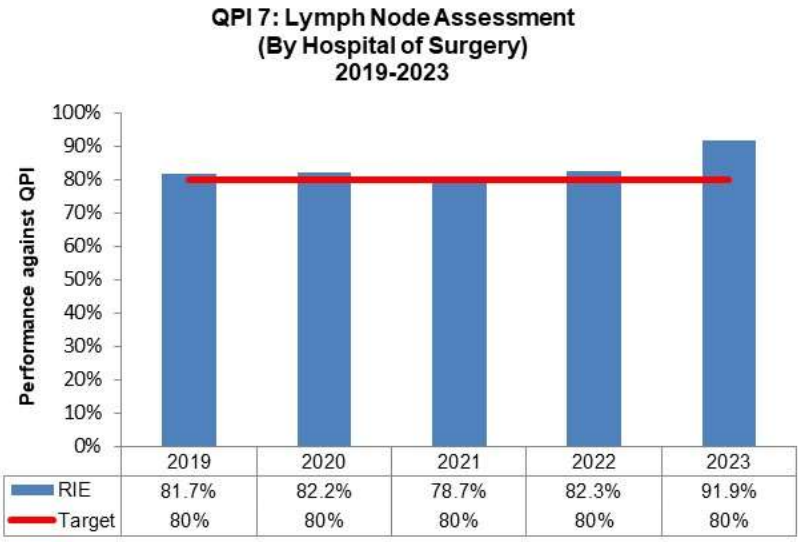
QPI 7 is analysed by *Hospital of Surgery* as compared to most other QPIs which are analysed by Board of Diagnosis. Surgical outcomes are the responsibility of the hospital where the surgery was undertaken. Responsibility does not lie with the Health Board who referred patients (often outwith their HB area) for surgical resection outcomes.

Numerator = Number of patients with NSCLC undergoing surgical resection by lobectomy or pneumonectomy that have at least 1 node from at least *3 x N2 stations* sampled at the time of resection or at previous mediastinoscopy.
Denominator = All patients with NSCLC undergoing surgical resection by lobectomy or pneumonectomy (no exclusions).

Royal Infirmary of Edinburgh (RIE)

Target 80%	2019	2020	2021	2022	**2023**
Numerator	107	111	107	107	124
Not recorded for numerator	0	0	2	0	0
Denominator*	131	135	136	130	135
Not recorded for denominator	0	0	0	0	0
Not recorded for exclusions	0	0	0	0	2
% Performance	**81.7%**	**82.2%**	**78.7%**	**82.3%**	**91.9%**

* The denominator includes patients who were diagnosed in NHS Tayside and in NHS Lanarkshire (1 in 2023), and who had surgery at RIE: 37 (2023); 13 (2022), 20 (2021); 15 (2020); and 24 (2019). Patients diagnosed in NHS Dumfries & Galloway are not included here; these patients have surgery at the Golden Jubilee Hospital, Clydebank and are reported by WoSCAN.



Comment

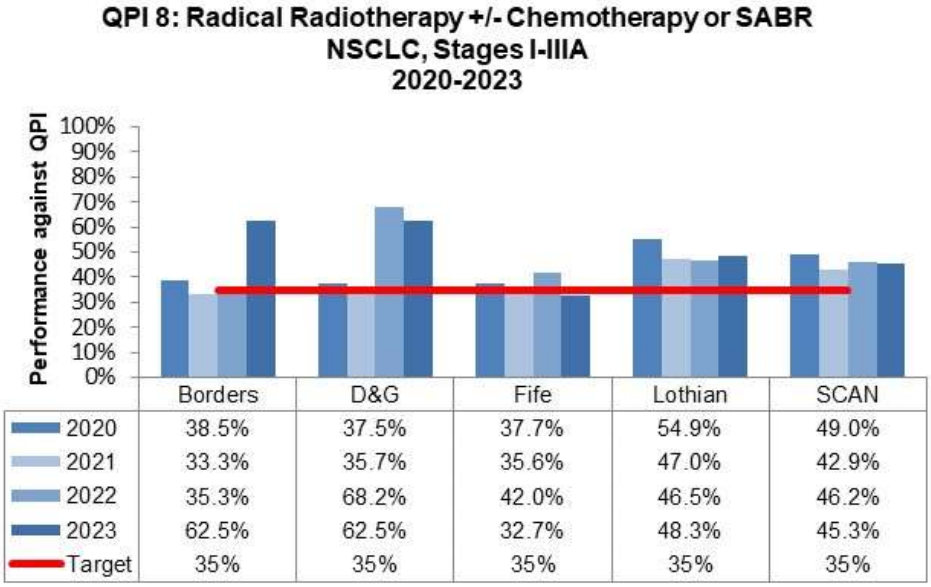
For this QPI, lymph node assessment is based on microscopic examination rather than nodal harvest rates, i.e. the nodal stations identified microscopically in the tissue blocks submitted and subsequently documented in pathology reports. While results are much improved in 2023 it should be noted that correlating actual nodal harvest with microscopic examination is not straightforward. If no lymph nodes are seen in a particular station, then sampling does not occur. Consistent sampling is therefore undertaken only where blocks or areas of multiple nodes are seen, with a view to accomplishing comprehensive sampling. For that reason, resection of lymph nodes can only be undertaken in good faith and unfortunately sometimes without the desired outcome. It therefore remains challenging given the possibility that nodes might not be identified *microscopically* in the tissue blocks submitted although it is anticipated that robotic resection will impact positively on performance levels.

QPI 8 Radiotherapy for Inoperable Lung Cancer Target = 35%

Numerator = Number of patients with stages I-IIIA lung cancer not undergoing surgery who receive radical radiotherapy[18] +/- chemotherapy, or SABR.
Denominator = All patients with stages I-IIIA lung cancer not undergoing surgery.
Exclusions = Patients with SCLC, patients who decline radiotherapy, or who die prior to treatment.

Target 35%	Borders	D&G	Fife	Lothian	SCAN
2023 cohort	101	135	358	729	1323
Ineligible for this QPI	75	99	254	502	930
Numerator	15	10	33	97	155
Not recorded for numerator	0	0	0	2	2
Denominator	24	16	101	201	342
Not recorded for denominator	2	20	3	26	51
Not recorded for exclusions	0	0	0	2	2
% Performance	**62.5%**	**62.5%**	**32.7%**	**48.3%**	**45.3%**

** Not recorded for denominator are those patients where TNM stage was not recorded.



Comment

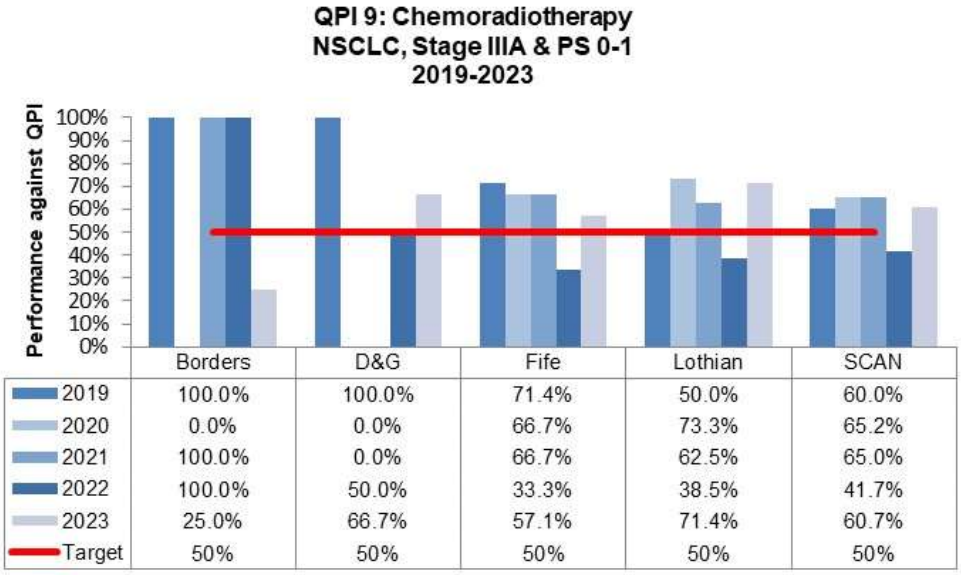
The QPI was missed by NHS Fife in 2023 with a shortfall of 2.3% (68 cases). The vast majority of outliers were unable to have radiotherapy due to comorbidities and/or frailty representing valid clinical reasons and no further action is required.

18 Radical Radiotherapy = Dose given for NSCLC ≥54Gy.

QPI 9 Chemoradiotherapy: Locally Advanced NSCLC Target = 50%

Numerator = Number of patients with NSCLC, Stage IIIA[19] and PS 0-1, not undergoing surgery and who receive Chemoradiotherapy[20].
Denominator = All patients with NSCLC, Stage IIIA and PS 0-1 not undergoing surgery who receive radical radiotherapy[21].
Exclusions = Patients who decline chemotherapy, patients who die before treatment, patients who receive Continuous Hyperfractionated Radiotherapy (CHART).

Target 50%	Borders	D&G	Fife	Lothian	SCAN
2023 cohort	101	135	358	729	1323
Ineligible for this QPI	97	132	351	714	1294
Numerator	1	2	4	10	17
Not recorded for numerator	0	0	0	0	0
Denominator	4	3	7	14	28
Not recorded for denominator	0	0	0	1	1
Not recorded for exclusions	0	0	0	0	0
% Performance	**25.0%**	**66.7%**	**57.1%**	**71.4%**	**60.7%**



	Borders	D&G	Fife	Lothian	SCAN
2019	100.0%	100.0%	71.4%	50.0%	60.0%
2020	0.0%	0.0%	66.7%	73.3%	65.2%
2021	100.0%	0.0%	66.7%	62.5%	65.0%
2022	100.0%	50.0%	33.3%	38.5%	41.7%
2023	25.0%	66.7%	57.1%	71.4%	60.7%
Target	50%	50%	50%	50%	50%

NOTE: 0% does not always represent the same outcome.
In 2021, D&G 0% (0/0), i.e. no patients met denominator criteria. In 2020, Borders 0% (0/1); D&G 0% (0/1) represents target not met.

Comment

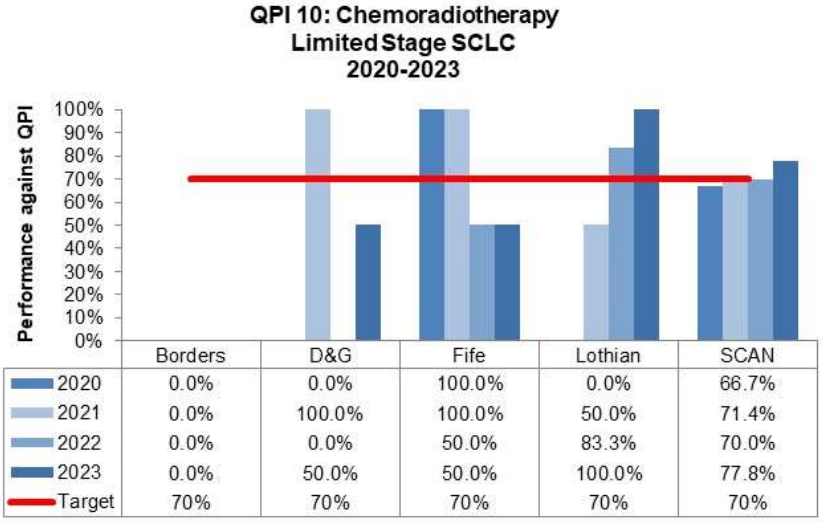
The QPI was missed in 2023 by NHS Borders with a shortfall of 25% (3 cases). The impact of small numbers cannot be ignored and for Borders, it is acknowledged that 1 patient either way makes the difference between meeting or missing the target. In previous years, Borders has achieved 100% (1/1) or 0% (no patients met the denominator criteria). In 2023 the 'artificial' drop in performance highlights the disproportionate effect that small numbers can have on percentage performance levels. Valid clinical reasons have been provided: poor fitness and/or comorbidities, including vascular disease and pulmonary fibrosis precluded treatment with chemoradiotherapy. No action is therefore required.

[19] Stage IIIA NSCLC includes: T1a-c N2 M0; T1b N2; T2a-b N2M0; T3 N1 M0; T4 N0-1 M0.
[20] NSCLC Chemoradiotherapy: radiotherapy ≥ 54Gy and concurrent or sequential chemotherapy.
[21] Radical radiotherapy: dose given for NSCLC ≥ 54Gy.

QPI 10 Chemoradiotherapy in Limited Stage Small Cell Lung Cancer Target = 70%

Numerator = Number of patients with SCLC, Stage I-IIIA[22] and PS 0-1 who receive chemoradiotherapy[23].
Denominator = All patients with SCLC, Stage I-IIIA and PS 0-1.
Exclusions = Patients who decline radiotherapy, who die before treatment, or those who undergo surgical resection.

Target 70%	Borders	D&G	Fife	Lothian	SCAN
2023 cohort	101	135	358	729	1323
Ineligible for this QPI	101	133	356	724	1314
Numerator	0	1	1	5	7
Not recorded for numerator	0	0	0	0	0
Denominator	0	2	2	5	9
Not recorded for denominator	0	0	0	0	0
Not recorded for exclusions	0	0	0	0	0
% Performance	**n/a**	**50.0%**	**50.0%**	**100.0%**	**77.8%**



	Borders	D&G	Fife	Lothian	SCAN
2020	0.0%	0.0%	100.0%	0.0%	66.7%
2021	0.0%	100.0%	100.0%	50.0%	71.4%
2022	0.0%	0.0%	50.0%	83.3%	70.0%
2023	0.0%	50.0%	50.0%	100.0%	77.8%
Target	70%	70%	70%	70%	70%

NOTE: In 2023, Borders 0% (0/0); in 2022, Borders 0% (0/0) & D&G 0% (0/0); in 2021, Borders 0% (0/0); and in 2020, Border 0% (0/0) & D&G 0% (0/0) all represent no patients met the denominator criteria. In 2020 Lothian 0% (0/1) represents target not met.

Comment

The very small numbers who are eligible for this QPI mean that results can be sparse and vary. Indeed in some years there is no representation at all. In 2023, the target was not met in NHS Dumfries & Galloway or NHS Fife with both health boards demonstrating shortfalls of 20% (1 case in each). 1 patient had vascular disease which precluded platinum-based chemotherapy while the other had large volume disease which was not encompassable in a radical radiotherapy field. These are valid clinical contraindications and no action is required.

[22] Patients with TxN0-N1M0 disease will be included within the measurement of this QPI. Stage I-IIIA includes T1aN0 – T4N1M0; T1a-T2bN2M0.
[23] SCLC Chemoradiotherapy: radiotherapy ≥ 40Gy and concurrent or sequential platinum-based chemotherapy.

QPI 11 Systemic Anti-Cancer Therapy (SACT) in Non-Small Cell Lung Cancer

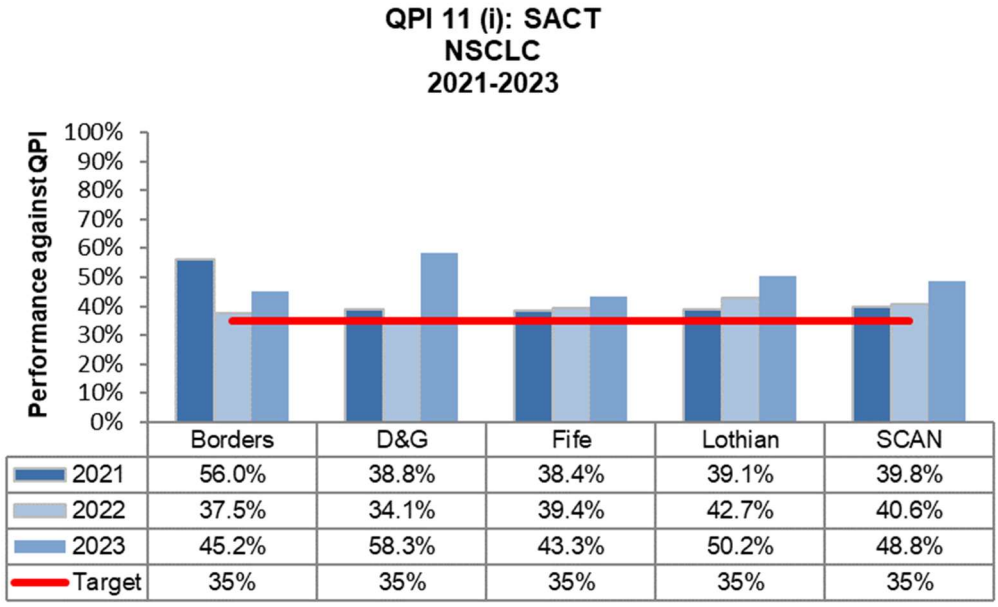
At Formal Review Cycle 2, the QPI 11 suite was revised to accommodate changes in oncology treatment management for patients diagnosed with NSCLC who receive SACT, as well as to provide more comprehensive reporting.

QPI 11 (i) considers all types of SACT treatment overall; QPI 11 (ii) focuses on targeted therapy; and QPI 11 (iii) reports on patients who receive immunotherapy either solely or as part of their chemoimmunotherapy treatment. New data items were introduced to the lung cancer dataset and were available for reporting from 1st January 2021.

11 (i) Patients with NSCLC who receive SACT — Target 35%

Numerator = Number of patients with NSCLC not undergoing surgery who receive SACT.
Denominator = All patients with NSCLC not undergoing surgery.
Exclusions = Patients who decline SACT treatment or who die before treatment.

Target 35%	Borders	D&G	Fife	Lothian	SCAN
2023 cohort	101	135	358	729	1323
Ineligible for this QPI	59	87	238	466	850
Numerator	19	28	52	132	231
Not recorded for numerator	0	0	0	0	0
Denominator	42	48	120	263	473
Not recorded for denominator	0	0	0	0	0
Not recorded for exclusions	0	0	0	0	0
% Performance	**45.2%**	**58.3%**	**43.3%**	**50.2%**	**48.8%**



	Borders	D&G	Fife	Lothian	SCAN
2021	56.0%	38.8%	38.4%	39.1%	39.8%
2022	37.5%	34.1%	39.4%	42.7%	40.6%
2023	45.2%	58.3%	43.3%	50.2%	48.8%
Target	35%	35%	35%	35%	35%

Comment
The QPI was passed by all health boards in the SCAN region in 2023 and no action is required.

11 (ii) NSCLC, Stage IIIB, IIIC or IV who receive Targeted Therapy Target 80%

Numerator = Number of patients with NSCLC, stages IIIB-IV with performance status 0-2 not undergoing surgery that have an oncogenic driver mutation who receive targeted therapy[24]
Denominator = All patients with NSCLC not undergoing surgery that have an oncogenic driver mutation.
Exclusions = Patients who decline SACT treatment, who die before treatment or who are participating in a clinical trial.

There are two possible analyses for QPI 11 (ii) shown below as *Analysis A* and *Analysis B*.

The relevant oncogenic driver mutations measured in this QPI are specified as EGFR, ALK or ROS1 (respectively Epidermal Growth Factor Receptor, Anaplastic Lymphoma Kinase, or ROS1-gene testing). EGFR biomarker testing is screened for exons 18-21, where the exon type informs the TKI agent-specific treatment management. Of the EGFR exon mutations, exon 20 is not indicated for first line TKI treatment. The QPI audit is primarily concerned with first line treatment and as such this particular exon mutation should have been excluded from the outset. This oversight was identified this year when exploring why targeted therapy was not given to individual patients.

Analysis A includes 6 patients with EGFR exon 20 mutation, 4 of which are from NHS Lothian (which misses the target). *Analysis B* correctly excludes exon 20 mutations. When EGFR exon 20 is excluded, all health boards exceed the 80% target.

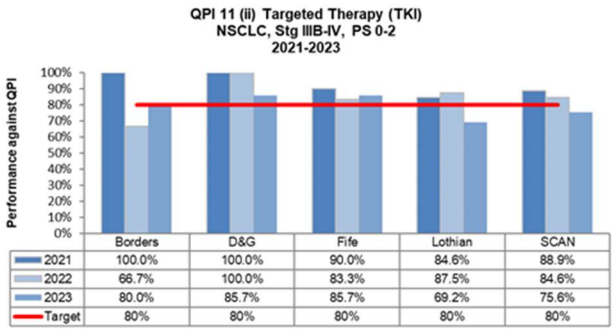
Analysis A

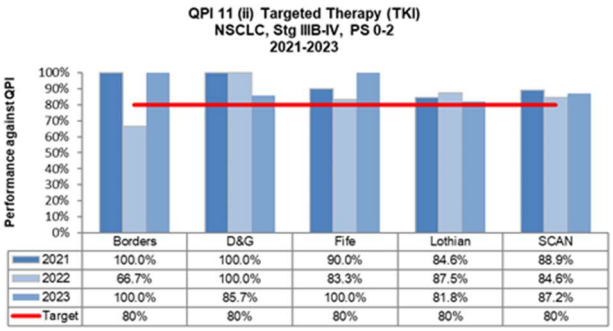
Target 80%	B	DG	F	L	SCAN
2023 Cohort	101	135	358	729	1323
Ineligible	96	128	351	703	1278
Numerator	**4**	**6**	**6**	**18**	**34**
NR for Num	0	0	0	0	0
Denominator	**5**	**7**	**7**	**26**	**45**
NR for Den	0	0	0	0	0
*NR for Excl	0	0	0	0	0
%Performance	**80.0%**	**85.7%**	**85.7%**	**69.2%**	**75.6%**

*Not recorded for Exclusion

Analysis B

Target 80%	B	DG	F	L	SCAN
2023 Cohort	101	135	358	729	1323
Ineligible	97	128	352	707	1284
Numerator	**4**	**6**	**6**	**18**	**34**
NR for Num	0	0	0	0	0
Denominator	**4**	**7**	**6**	**22**	**39**
NR for Den	0	0	0	0	0
*NR for Excl	0	0	0	0	0
%Performance	**100%**	**85.7%**	**100%**	**81.8%**	**87.2%**





Comment
The QPI should therefore be documented as passed by all health boards in the SCAN region in 2023.

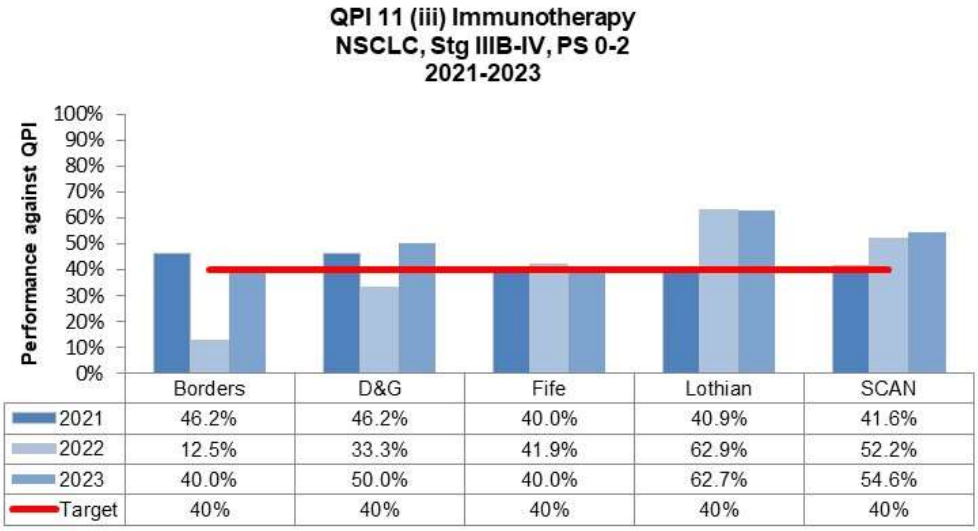
Action: Lung Cancer Formal Review Cycle 3 with a view to excluding patients with EGFR exon 20 mutation from the analysis.

[24] Targeted Therapy: TKIs (Tyrosine Kinase Inhibitors)

11 (iii) NSCLC, Stage IIIB, IIIC or IV who receive Immunotherapy Target 40%

Numerator = Number of patients with NSCLC, stages IIIB-IV with performance status 0-2 not undergoing surgery that are oncogenic mutation negative who receive immunotherapy.
Denominator = All patients with NSCLC, stage IIIB-IV with PS 0-2, not undergoing surgery that are oncogenic mutation negative.
Exclusions = Patients who decline SACT treatment, who die before treatment or who are participating in a clinical trial.

Target 40%	Borders	D&G	Fife	Lothian	SCAN
2023 cohort	101	135	358	729	1323
Ineligible for this QPI	96	113	322	645	1176
Numerator	2	9	14	52	77
Not recorded for numerator	0	0	0	0	0
Denominator	5	18	35	83	141
Not recorded for denominator	0	4	1	1	6
Not recorded for exclusions	0	0	0	0	0
% Performance	**40.0%**	**50.0%**	**40.0%**	**62.7%**	**54.6%**



Comment
The QPI was passed by all health boards in the SCAN region in 2023.

It has been noticed that the criteria have been incorrectly specified because the immunotherapy agent Pembrolizumab is only available on licence to stage IV patients. Pembrolizumab when used for Stage III patients is only available when giving second line treatment; which is not in audit's QPI reporting remit (which is concerned only with first line treatment). Additionally patients with PS2 are not eligible for first line immunotherapy and should not be included in the denominator but should be moved to *ineligible* status.

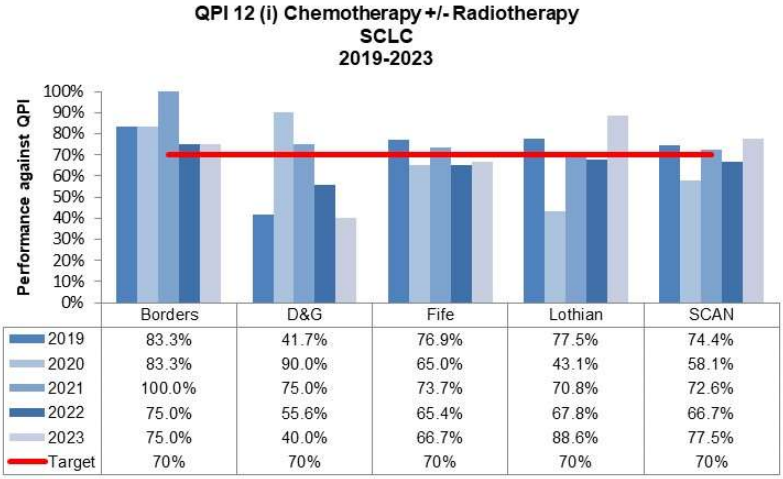
Action: Formal Review Cycle 3 – QPI denominator (and numerator) to be amended to *All patients with NSCLC who are stage IV and PS 0-1 not having surgery that are oncogene mutation negative*.

QPI 12 Chemotherapy for Small Cell Lung Cancer

QPI 12 (i) Patients with SCLC who receive chemotherapy ± radiotherapy Target = 70%

Numerator = Number of patients with SCLC who receive chemotherapy[25] ± radiotherapy.
Denominator = All patients with SCLC.
Exclusions = Patients who decline chemotherapy, patients who die before treatment and patients who are participating in clinical trials.

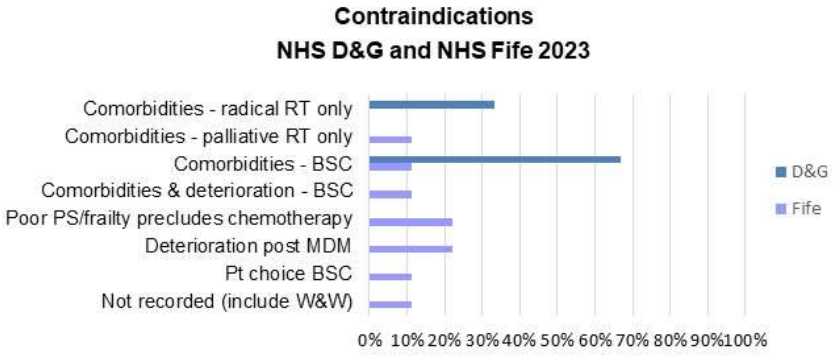
Target 70%	Borders	D&G	Fife	Lothian	SCAN
2023 cohort	101	135	358	729	1323
Ineligible for this QPI	97	130	331	685	1243
Numerator	3	2	18	39	62
Not recorded for numerator	0	0	1	0	1
Denominator	4	5	27	44	80
Not recorded for denominator	0	0	0	0	0
Not recorded for exclusions	0	0	0	0	0
% Performance	**75.0%**	**40.0%**	**66.7%**	**88.6%**	**77.5%**



	Borders	D&G	Fife	Lothian	SCAN
2019	83.3%	41.7%	76.9%	77.5%	74.4%
2020	83.3%	90.0%	65.0%	43.1%	58.1%
2021	100.0%	75.0%	73.7%	70.8%	72.6%
2022	75.0%	55.6%	65.4%	67.8%	66.7%
2023	75.0%	40.0%	66.7%	88.6%	77.5%
Target	70%	70%	70%	70%	70%

Comment
This QPI was passed by NHS Borders and Lothian but showed shortfalls in NHS D&G of 30% (3 cases); and Fife of 3.3% (9 cases). The denominator produces very small cohorts and the potential consequences of skewed or disproportionate outcomes should be acknowledged when scrutinizing results.

Investigations for patients diagnosed with SCLC should always be organised as “urgent” to counteract any potential delays. Valid clinical reasons are provided for all cases. No action is required.

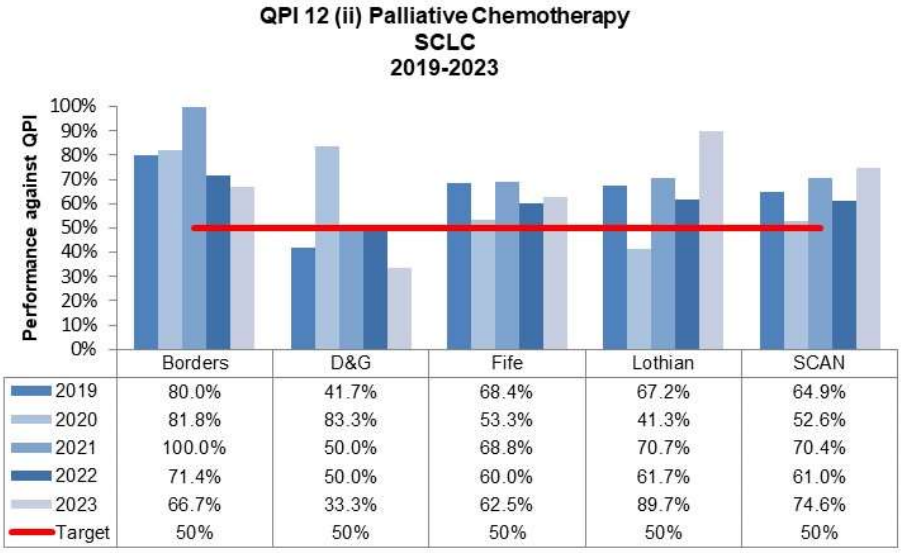


[25] Chemotherapy includes neoadjuvant, adjuvant, chemoradiotherapy or palliative chemotherapy.

QPI 12 (ii) Palliative Chemotherapy: Patients with SCLC Target = 50%

Numerator = Number of patients with SCLC not undergoing treatment with curative intent who receive palliative chemotherapy.
Denominator = All patients with SCLC not undergoing treatment with curative intent.
Exclusions = Patients who decline chemotherapy, patients who die before treatment and patients who are participating in clinical trials.

Target 50%	Borders	D&G	Fife	Lothian	SCAN
2023 cohort	101	135	358	729	1323
Ineligible for this QPI	98	132	333	698	1261
Numerator	2	1	15	26	44
Not recorded for numerator	0	0	0	0	0
Denominator	3	3	24	29	59
Not recorded for denominator	0	0	1	2	3
Not recorded for exclusions	0	0	0	0	0
% Performance	**66.7%**	**33.3%**	**62.5%**	**89.7%**	**74.6%**



	Borders	D&G	Fife	Lothian	SCAN
2019	80.0%	41.7%	68.4%	67.2%	64.9%
2020	81.8%	83.3%	53.3%	41.3%	52.6%
2021	100.0%	50.0%	68.8%	70.7%	70.4%
2022	71.4%	50.0%	60.0%	61.7%	61.0%
2023	66.7%	33.3%	62.5%	89.7%	74.6%
Target	50%	50%	50%	50%	50%

Comment

NHS Dumfries & Galloway missed QPI 12 (ii) with a shortfall of 16.7% (2 cases). The denominator produces particularly small cohorts which in turn often creates ‘misrepresentative’ percentage outcomes and, indeed, 1 patient either way constitutes setback or success with results showing either 33.3% or 66.6%. The 2 outliers were unsuitable for palliative chemotherapy due to significant comorbidities which impacted on their fitness and precluded treatment.

QPI 13 Mortality following Active Treatment: 30- and 90-Day

All patients who die within 30- and 90-days of treatment completion are discussed and reported at regularly held Mortality and Morbidity (M&M) meetings. It is standard QPI practice to report reasons only for outliers but for completeness, and in line with M&M protocols, reasons are given here for *all* patients who die within 30- and 90-days of treatment regardless of whether results remain within the accepted parameters or if they are exceeded. Patients for whom 30- or 90-days have not passed since treatment are not included in the denominator.

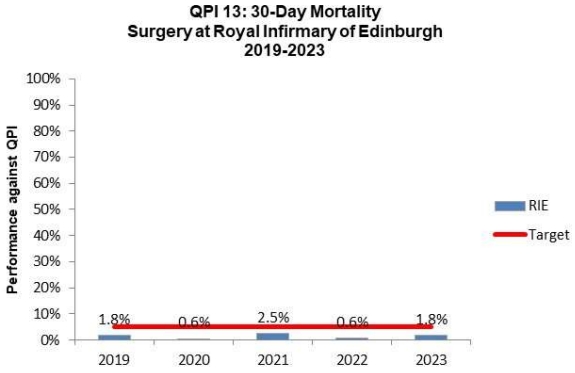
QPI 13 (i) A: Surgery: 30-Day Mortality **Target <5%**

Numerator = Number of patients who receive surgery who die within 30 days of treatment.
Denominator = All patients with lung cancer who receive surgery (no exclusions).

Royal Infirmary of Edinburgh

30 Day Target <5%	2019	2020	2021	2022	**2023**
Numerator	3	1	4	1	**3**
NR* numerator	0	0	0	0	**0**
Denominator[26]	166	172	157	161	**167**
NR denominator	0	0	0	0	**0**
NR exclusions	0	0	0	0	**0**
% Performance	**1.8%**	**0.6%**	**2.5%**	**0.6%**	**1.8%**

*NR: Not Recorded

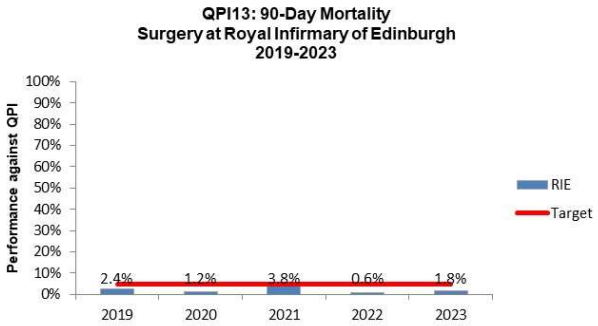


QPI 13 (i) B: Surgery: 90-Day Mortality **Target <5%**

Numerator = Number of patients who receive surgery who die within 90 days of treatment.
Denominator = All patients with lung cancer who receive surgery (no exclusions).

Royal Infirmary of Edinburgh

90 Day Target <5%	2019	2020	2021	2022	**2023**
Numerator	4	2	6	1	**3**
NR* numerator	0	0	0	0	**0**
Denominator[27]	164	172	156	161	**166**
NR denominator	0	0	0	0	**0**
NR exclusions	0	0	0	0	**0**
% Performance	**2.4%**	**1.2%**	**3.8%**	**0.6%**	**1.8%**



[26] The denominator in both 30- and 90- day mortality analyses include patients diagnosed in NHS Tayside (46 (2023), 19 (2022), 22 (2021), 61 (2020), and 35 (2019)) or NHS Lanarkshire (1 (2023)), who had surgery in Edinburgh. Patients from NHS D&G are not included in the denominator; they have surgery at the Golden Jubilee Hospital, Clydebank and are reported by WoSCAN.

[27] The difference in denominator totals (1 less patient in 90-day reporting in 2023 and 2021 compared to 30-day and a difference of 3 in 2019) is accounted for by the number of days which have passed since the date of surgery to the date of analysis/reporting. If less than 90 days have passed since the date of surgery, the patient will not appear in the 90-day report.

Comment: Surgical Resection 30- and 90-Day Mortality

Surgical outcomes are the responsibility of the hospital where the surgical procedure was undertaken and not that of the health board that referred patients for surgical resection (in many cases to hospitals outwith their health board area). As a consequence, 30- and 90-day mortality post-surgery are analysed by *Hospital of Surgery*. In SCAN, thoracic surgery is performed at the Royal Infirmary of Edinburgh.

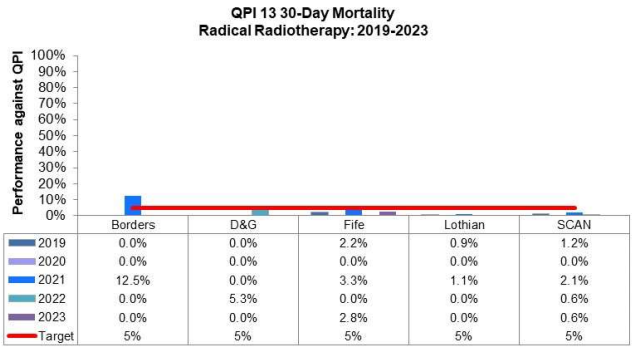
There were 3 deaths which occurred within 30/90 days of surgery. Results remain within the accepted target parameters and as such are in line with good clinical practice.

QPI 13 (ii) Radical Radiotherapy: 30- & 90- Day Mortality **Target <5%**

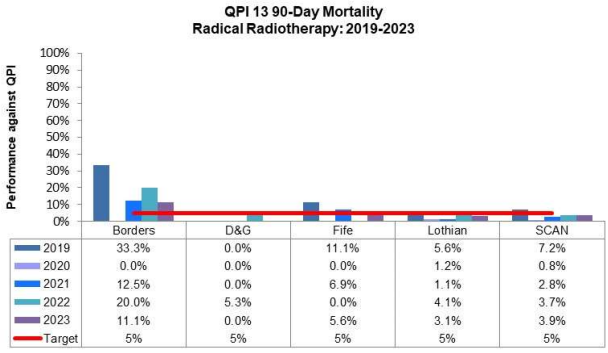
Numerator = Number of patients who receive radical radiotherapy[28] who die within 30 and 90 days of treatment.
Denominator = All patients with lung cancer who receive radical radiotherapy (no exclusions).

Target <5%	Borders		D&G		Fife		Lothian		SCAN	
	30	90	30	90	30	90	30	90	30	90
2023 cohort	101	101	135	135	358	358	729	729	1323	1323
Ineligible for this QPI	92	92	123	123	321	322	628	629	1164	1165
Numerator	0	1	0	0	1	2	0	3	1	6
Not recorded for numerator	0	0	0	0	1	0	0	0	1	0
*Denominator	9	9	12	12	36	36	99	98	156	155
Not recorded for denominator	0	0	0	0	1	1	2	2	3	3
Not recorded for exclusions	0	0	0	0	0	0	0	0	0	0
% Performance	**0.0**	**11.1**	**0.0**	**0.0**	**2.8**	**5.6**	**0.0**	**3.1**	**0.6**	**3.9**

*The denominator in Lothian for 30-day is 99 compared to 98 for 90-day mortality. 90 days had not elapsed since treatment for 1 patient who is therefore not included in the 90-day denominator.



	Borders	D&G	Fife	Lothian	SCAN
2019	0.0%	0.0%	2.2%	0.9%	1.2%
2020	0.0%	0.0%	0.0%	0.0%	0.0%
2021	12.5%	0.0%	3.3%	1.1%	2.1%
2022	0.0%	5.3%	0.0%	0.0%	0.6%
2023	0.0%	0.0%	2.8%	0.0%	0.6%
Target	5%	5%	5%	5%	5%



	Borders	D&G	Fife	Lothian	SCAN
2019	33.3%	0.0%	11.1%	5.6%	7.2%
2020	0.0%	0.0%	0.0%	1.2%	0.8%
2021	12.5%	0.0%	6.9%	1.1%	2.8%
2022	20.0%	5.3%	0.0%	4.1%	3.7%
2023	11.1%	0.0%	5.6%	3.1%	3.9%
Target	5%	5%	5%	5%	5%

Comment: Radical Radiotherapy 30- & 90-Day Mortality

Relatively small numbers mean that individual events and/or volume of disease in a year's cohort may have significant impact on percentage outcomes, for example NHS Borders 90-day radical radiotherapy mortality of 11.1% (1/9 patients); and for Fife a result of 5.6% (2/36). SCAN results overall remain within the accepted parameters. There were no deaths within these timescales in NHS Dumfries & Galloway.

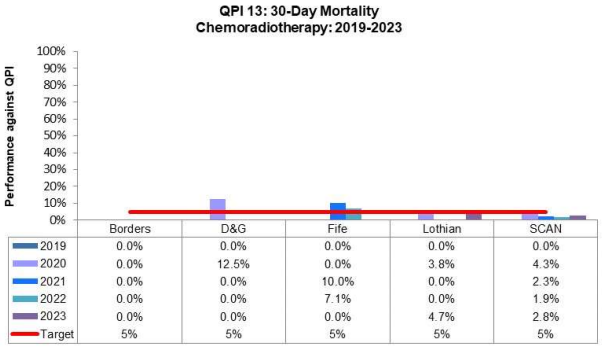
In line with M&M protocols, case review is appropriate for all patients who die within 30- and 90-days of treatment; regardless of whether results remain within the QPI accepted parameters or if they are exceeded.

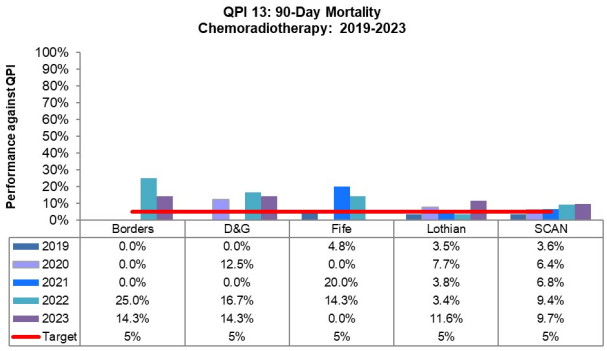
[28] Radical radiotherapy includes conventional radical radiotherapy and SABR.

QPI 13 (iii) Chemoradiotherapy: 30-and 90-Day Mortality **Target <5%**

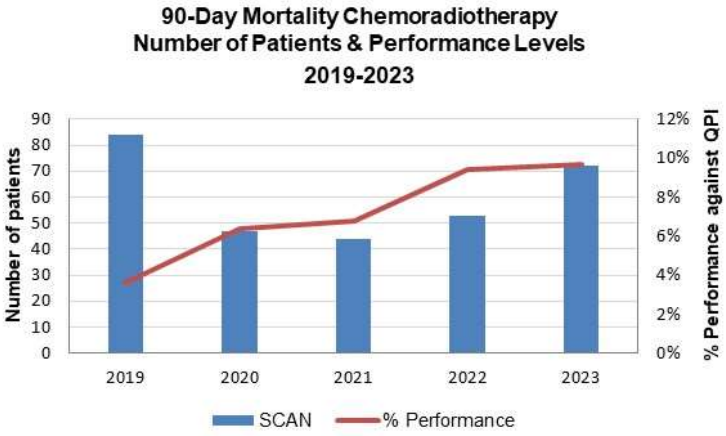
Numerator = Number of patients who receive chemoradiotherapy who die within 30- and 90-days of treatment.
Denominator = All patients with lung cancer who receive chemoradiotherapy (no exclusions).

Target <5%	Borders		D&G		Fife		Lothian		SCAN	
	30	90	30	90	30	90	30	90	30	90
2023 cohort	101	101	135	135	358	358	729	729	1323	1323
Ineligible for this QPI	94	94	128	128	343	343	686	686	1251	1251
Numerator	**0**	**1**	**0**	**1**	**0**	**0**	**2**	**5**	**2**	**7**
Not recorded for numerator	0	0	0	0	0	0	0	0	0	0
Denominator	**7**	**7**	**7**	**7**	**15**	**15**	**43**	**43**	**72**	**72**
Not recorded for denominator	0	0	0	0	0	0	0	0	0	0
Not recorded for exclusions	0	0	0	0	0	0	0	0	0	0
% Performance	**0.0**	**14.3**	**0.0**	**14.3**	**0.0**	**0.0**	**4.7**	**11.6**	**2.8**	**9.7**





Comment: Chemoradiotherapy 30- & 90-Day Mortality
Chemoradiotherapy 90-day mortality across SCAN returned 9.7% in 2023. Review of recent years suggests that the number of patients treated with chemoradiation appears to be increasing. 90-day mortality, however, remains relatively static. It is difficult when, even SCAN wide, the percentages reflect still small numbers of patients where individual events/patient/disease related factors may have a significant impact on results. Comparison, however, across other Scottish regions would suggest that SCAN is not an outlier, with similar mortality rates in this setting with co-morbid patients and locally advanced cancer across all 3 Scottish cancer networks.



Denominator general growth from 2020-2023 (47, 44, 53) to 72 in 2023 but note 2019 denominator of 84 with 3.6% (3/84) 90-day mortality.

In 2023, there are relatively small numbers (particularly in NHS Borders and Dumfries & Galloway) where individual factors within this cohort may influence percentage performance outcomes but the relatively high results of 14.3% (Borders and D&G) and 11.6% (Lothian) should not be a cause for unwarranted concern. Moreover, by nature of locally advanced disease, the risk of local progression or metastatic disease progression is higher. There were no deaths within these timescales in NHS Fife.

In line with M&M protocols, case review is appropriate for all patients who die within 30- and 90-days of treatment; regardless of whether results remain within the QPI accepted parameters or if they are exceeded.

The QPI 13 suite was set up to examine treatment related mortality as a marker of the quality and safety of the whole service provided by the MDT and to provide a record, within the QPI setting, of outcomes of treatment specifically concerning treatment related morbidity and mortality. At the outset we reported on surgical, radiotherapy and *all* SACT patients but in 2019 this was limited to curative treatment only, i.e. surgery, radical radiotherapy and radical chemoradiotherapy.

Treatment options have evolved and curative treatment can now be given as a 'package', for example surgery plus adjuvant SACT or chemoradiotherapy plus adjuvant immunotherapy. The current methodology does not accommodate cases where a patient's death might be related to, for example, immunotherapy induced pneumonitis rather than resulting from the initial chemoradiotherapy component.

Action: Formal Review Cycle 3 to discuss methods for reporting curative treatment 'packages' within 30- and 90-day mortality analyses.

QPI 13: 30-Day Mortality: Palliative SACT & 30-Day Mortality: Adjuvant SACT

These QPIs have been replaced with a standardised 30-day SACT Mortality QPI across all the tumour types covered by the QPI programme although, reference has been made in this report to adjuvant SACT where relevant to 30- and 90-day mortality post chemoradiotherapy where patients have also received adjuvant immunotherapy.

Mortality within 30 days of SACT is subject to M+M peer review on a regular basis (as per CEL 30) and action plans are developed each year. These are reported separately for all tumour types to the SACT lead. There were no cases requiring escalation for external review identified for cases in 2023**.**

SACT mortality reporting is undertaken by Public Health Scotland (PHS). The most recent publication reports on the proportion of patients *treated* in 2023 who died within 30 days of starting their last cycle of systemic anti-cancer therapy for any type of cancer.

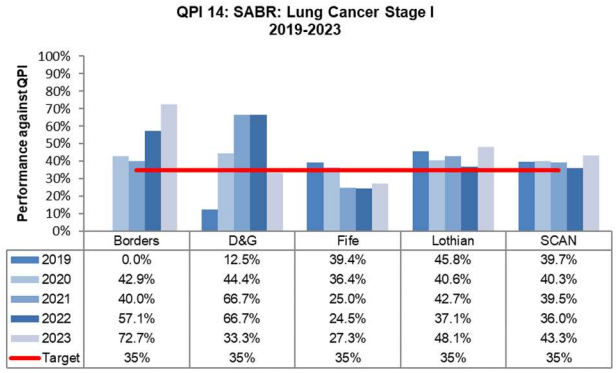
The Dashboard (methods, charts, and data) is available at Dashboard - 30-day mortality after systemic anti-cancer therapy (SACT) - patients treated in 2023 - 30-day mortality after systemic anti-cancer therapy (SACT) - Publications - Public Health Scotland

The Report is available at 30-day mortality after systemic anti-cancer therapy (SACT) - patients treated in 2023 - 30-day mortality after systemic anti-cancer therapy (SACT) - Publications - Public Health Scotland

QPI 14 SABR in Inoperable Stage I Lung Cancer — Target = 35%

Numerator = Number of patients with Stage I[29] lung cancer not undergoing surgery who receive SABR[30].
Denominator = All patients with Stage I lung cancer not undergoing surgery.
Exclusions = Patients with SCLC, patients who decline SABR and patients who die before treatment.

Target 35%	Borders	D&G	Fife	Lothian	SCAN
2023 cohort	101	135	358	729	1323
Ineligible for this QPI	88	107	312	601	1108
Numerator	8	4	12	50	74
Not recorded for numerator	0	0	0	1	1
Denominator	11	12	44	104	171
Not recorded for denominator	2	16	2	24	44
Not recorded for exclusions	0	0	0	1	1
% Performance	**72.7%**	**33.3%**	**27.3%**	**48.1%**	**43.3%**



	Borders	D&G	Fife	Lothian	SCAN
2019	0.0%	12.5%	39.4%	45.8%	39.7%
2020	42.9%	44.4%	36.4%	40.6%	40.3%
2021	40.0%	66.7%	25.0%	42.7%	39.5%
2022	57.1%	66.7%	24.5%	37.1%	36.0%
2023	72.7%	33.3%	27.3%	48.1%	43.3%
Target	35%	35%	35%	35%	35%

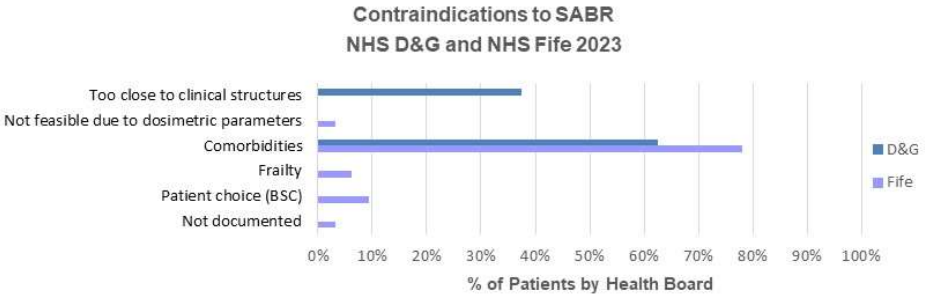
Comment

Often patients have multiple medical co-morbidities which preclude surgical resection or patients may decide to decline surgery. Radical radiotherapy, including SABR, provides an alternative treatment for these patients.

The target was not met in NHS D&G with a shortfall of 1.7% (8 cases). Numbers are very small in the more peripheral boards and the small drop in performance might in fact be due to chance.

The target was not met in Fife with a shortfall of 7.7% (32 cases). Comorbidity was cited as the main reason which precluded SABR for a sizeable proportion of patients in Fife.

Given the QPI has not been achieved over the last few years by NHS Fife, it is important to audit these cases to confirm the level of comorbidity and frailty in each case and the appropriateness of that management outcome. An audit will also examine if there were any other barriers to treatment, for example: travel distance and, will explore survival outcomes.



Action: An audit has been proposed in NHS Fife and will be reported in due course.

[29] Stage I: T1(mi) –T2a N0 M0
[30] SABR: Stereotactic Ablative Radiotherapy

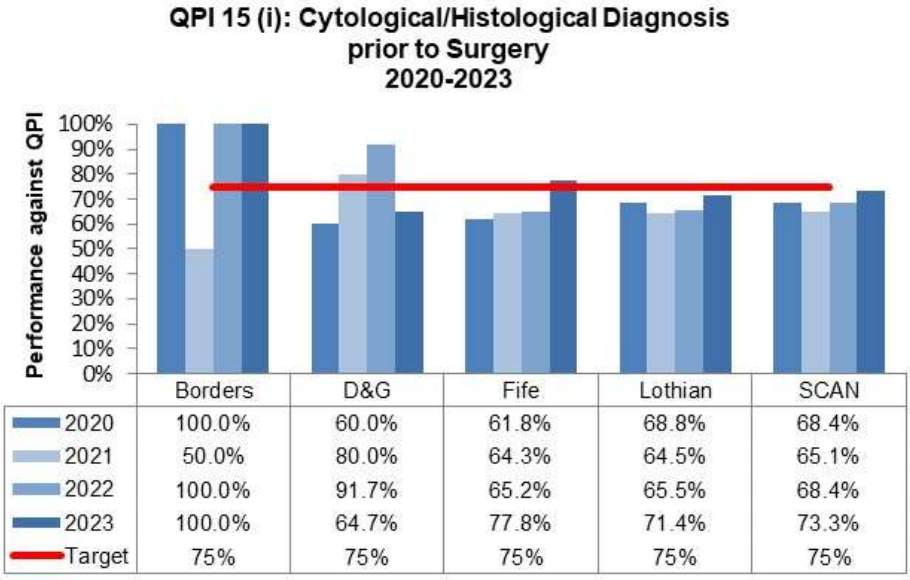
QPI 15 Pre-Treatment Diagnosis

It is desirable to have confirmation of a cancer diagnosis prior to proceeding to definitive radical treatment. Appropriate treatment depends on accurate diagnosis which should be confirmed by cytology or histology and, it is important to inform patients and carers about the nature of the disease, the likely prognosis and treatment choices[31].

QPI 15 (i) Cytology or Histology Prior to Thoracic Surgery Target = 75%

Numerator = Number of patients with lung cancer receiving surgery who have a cytological / histological diagnosis prior to definitive treatment.
Denominator = All patients with lung cancer who receive surgery.
Exclusions = Patients who decline investigations.

Target 75%	Borders	D&G	Fife	Lothian	SCAN
2023 cohort	101	135	358	729	1323
Ineligible for this QPI	92	118	340	636	1186
Numerator	9	11	14	65	99
Not recorded for numerator	0	0	0	0	0
Denominator	9	17	18	91	135
Not recorded for denominator	0	0	0	2	2
Not recorded for exclusions	0	0	0	0	0
% Performance	**100.0%**	**64.7%**	**77.8%**	**71.4%**	**73.3%**



	Borders	D&G	Fife	Lothian	SCAN
2020	100.0%	60.0%	61.8%	68.8%	68.4%
2021	50.0%	80.0%	64.3%	64.5%	65.1%
2022	100.0%	91.7%	65.2%	65.5%	68.4%
2023	100.0%	64.7%	77.8%	71.4%	73.3%
Target	75%	75%	75%	75%	75%

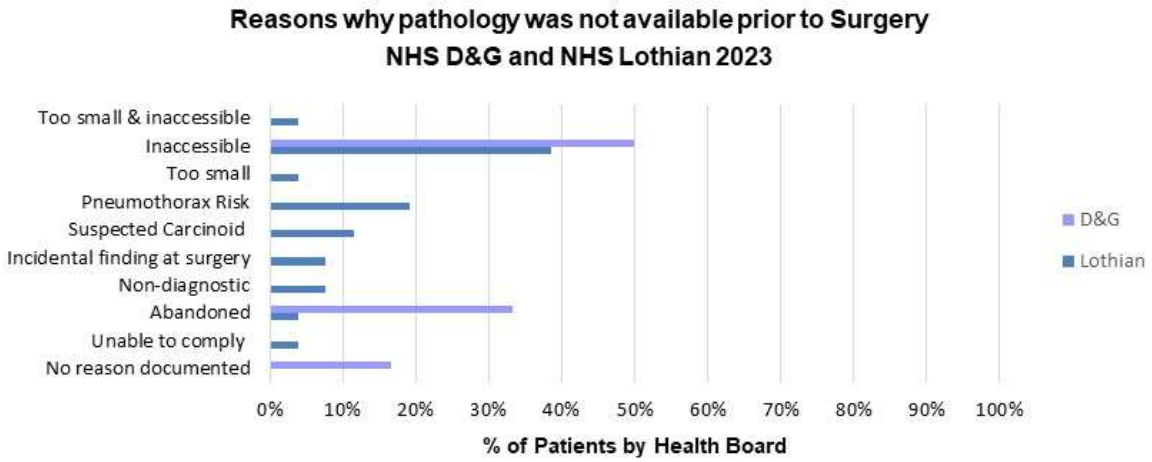
Comment

It should be noted that obtaining histology or cytology prior to surgery is not always considered the most appropriate course of action nor always in the patient's best interest. Lesions might be too small or peripheral, and therefore inaccessible to biopsy. It is additionally difficult to justify multiple invasive attempts which all demonstrate negative or inconclusive histologies. All patients are discussed fully by MDT so that all approaches are considered and so that all proper processes take their course.

The most recent 3 years' demonstrate improvement in SCAN which is likely driven by better diagnostics and treatment approaches.

[31] "Rationale and Evidence" from Scottish Government and Healthcare Improvement Scotland: *Scottish Cancer Taskforce: Lung Cancer Clinical Quality Performance Indicators (Version 4.1: September 2021).*

In 2023, the target was narrowly missed in NHS Lothian with a shortfall of only 3.6% (26 cases). Small numbers in more peripheral health boards mean that a few patients can easily alter results so that targets appear easily met or missed as evidenced in NHS Dumfries & Galloway, where another 2 patients would have made the difference between missing or meeting the target. NHS D&G had a shortfall of 10.3% (6 cases). Valid clinical reasons have been provided for all cases:



Risk aversion might play a role in some cases, in that some radiology departments might be more likely to take on difficult lesions for CT biospy than others, but this is difficult to prove or disprove.

Where histology is not possible, an alternative non-invasive malignancy indicator which can influence treatment decisions, more particularly radical options of surgical intervention or radical radiotherapy, is desirable. The British Thoracic Society (BTS) guidelines for initial investigation of nodules suggested Herder score as a useful clinical prediction model to characterise pulmomary nodules as likely being malignant. In previous years of reporting, Herder had been recorded in SCAN and used as a means of explanation as to why radical treatment was offered without pathology in place. However, the usefulness of herder is currently being reassessed. Herder is mostly relevant to only the *first* CT scan and the immediate subsequent PET CT. Meanwhile, serial CT scans, which can provide *evidence of growth,* are becoming the preferred and more compelling indicator to influence treatment decisions. It is also anticipated that upcoming nodule guidelines may further negate the importance of Herder. It has therefore been proposed to cease recording and reporting Herder score going forward.

There are also a group of patients who undergo surgery, without pre-surgical pathology in place, and who are found to have benign lesions when the resected tissue is examined microscopically. Data is not currently collected and so the full extent of this cannot be explored at this time.

At the SCAN Regional Sign Off meeting, the appropriateness of measurement against identical targets for QPI 15 (i) prior to surgery and QPI 15 (ii) prior to radical radiotherapy was discussed. Surgical patients are generally of better fitness levels than those patients who have radical radiotherapy and as such surgical patients would be expected to perform better, i.e. be more suitable for biopsy prior to treatment. These two groups of patients form distinct categories based on differing fitness and comorbid levels and, targets of differing levels would be more appropriate. The target of 75% is deemed appropriate to those ‘fitter’ patients who have surgical resection but should be revised for patients of the second, less fit, cohort type.

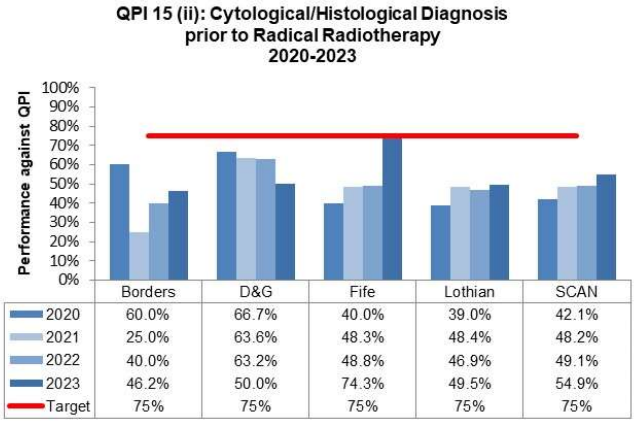
Action: Formal Review Cycle 3

1. To discuss the relevance of Herder score.
2. To request a change in target levels to distinguish between the different cohort types associated with QPI 15 (i) and (ii). The target for QPI 15 (ii) should be discussed and reduced.

QPI 15 (ii) Cytology or Histology prior to Radical Radiotherapy Target = 75%

Numerator = Number of patients with lung cancer receiving radical radiotherapy who have a cytological/histological diagnosis prior to definitive treatment.
Denominator = All patients with lung cancer who receive radical radiotherapy.
Exclusions = Patients who decline investigations.

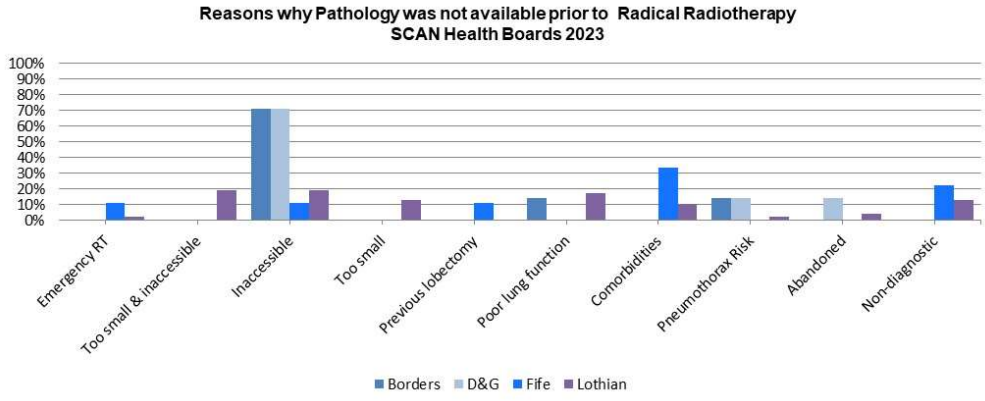
Target 75%	Borders	D&G	Fife	Lothian	SCAN
2023 cohort	101	135	358	729	1323
Ineligible for this QPI	88	123	322	634	1167
Numerator	6	6	26	46	84
Not recorded for numerator	0	0	0	0	0
Denominator	13	12	35	93	153
Not recorded for denominator	0	0	1	2	3
Not recorded for exclusions	0	0	0	0	0
% Performance	**46.2%**	**50.0%**	**74.3%**	**49.5%**	**54.9%**



Comment

Allowances should be made where small numbers and variation may be due to chance. Aggregation of results over time may be useful to clarify results where numbers are small. It should be noted that disproportionate percentages are often a consequence of the analyses of small number cohorts.

The target has been consistently missed across the SCAN region year on year and this QPI continues to be challenging. The impact of small numbers cannot be ignored more particularly as demonstrated in the percentage values of 'shortfalls', i.e. the difference between the target and actual performance, more especially in the smaller more peripheral health boards of Borders and Dumfries & Galloway. In 2023, NHS Borders had a shortfall of 28.8% (7 cases) and D&G 25% (6 cases). A similarly high level of 25.5% (47 cases) is shown for NHS Lothian. NHS Fife has a modest shortfall of 0.7% (9 cases) Valid clinical reasons have been demonstrated:

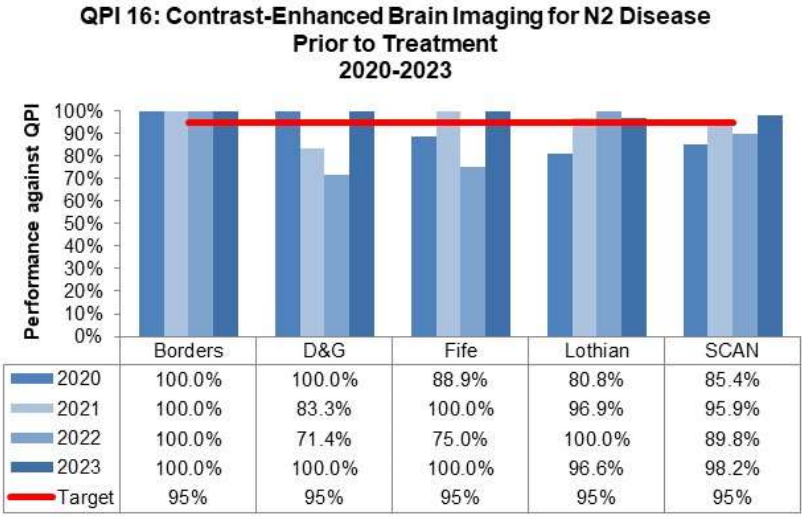


Action: Formal Review Cycle 3 – to discuss the relevance of Herder score and the target levels for QPI 15 (i) and (ii) with a view to lowering the latter.

QPI 16 Brain Imaging for Lung Cancer Patients with N2 Disease Target = 95%

Numerator = Number of patients with lung cancer N2 disease who receive curative treatment that undergo contrast enhanced CT/MRI scanning prior to the start of definitive treatment.
Denominator = All patients with lung cancer N2 disease who receive curative treatment[32].
Exclusions = Patients who decline brain imaging and patients diagnosed with SCLC.

Target 95%	Borders	D&G	Fife	Lothian	SCAN
2023 cohort	101	135	358	729	1323
Ineligible for this QPI	93	125	342	694	1254
Numerator	8	6	13	28	55
Not recorded for numerator	0	0	0	0	0
Denominator	8	6	13	29	56
Not recorded for denominator	0	4	3	6	13
Not recorded for exclusions	0	0	0	0	0
% Performance	**100.0%**	**100.0%**	**100.0%**	**96.6%**	**98.2%**



Comment

The QPI was passed by all health boards in the SCAN region in 2023.

Referral of patients with N2 disease for brain imaging by the MDT, or before, is crucial to treatment management decisions. Discussion at the National Lung Cancer Audit & Education Event hosted by SCAN in May 2024 considered an overall 'national' MDT approach to facilitate the recording of all QPI requirements, including prompts for brain imaging for patients with N2 disease who are being considered for curative treatment.

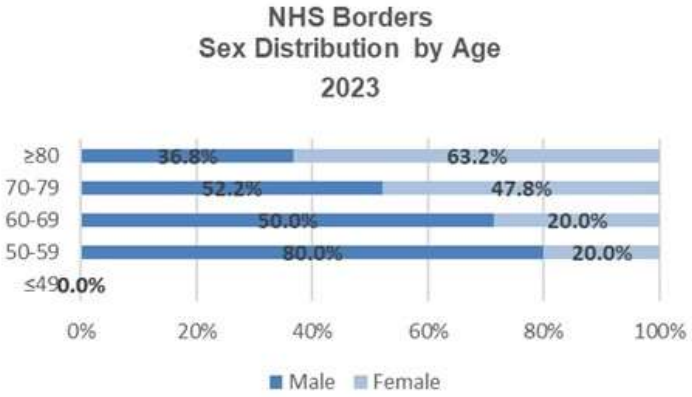
Action: Formal Review Cycle 3: discuss the option of a 'national' MDT form.

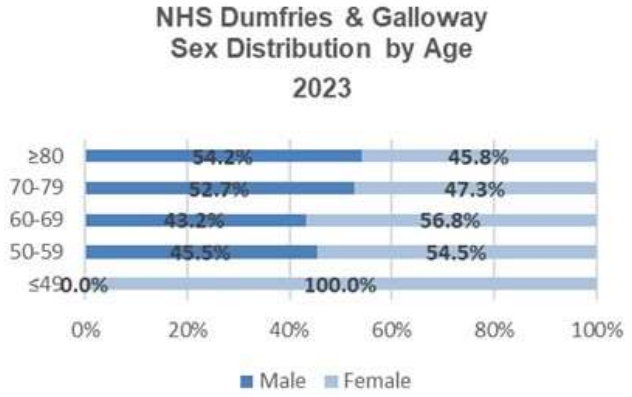
[32] Curative treatment: radical radiotherapy, radical chemoradiotherapy or surgical resection.

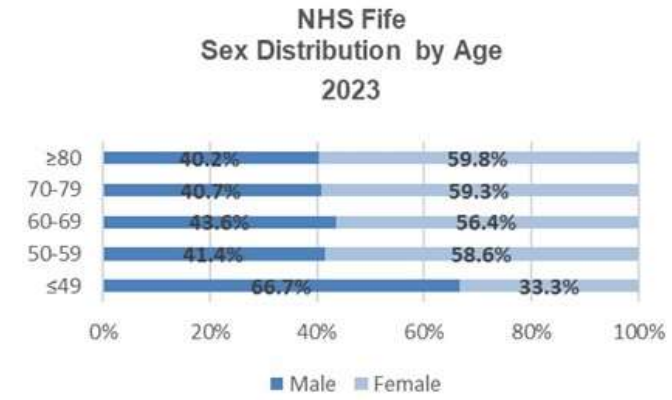
Appendices
Appendix 1: Key Categories

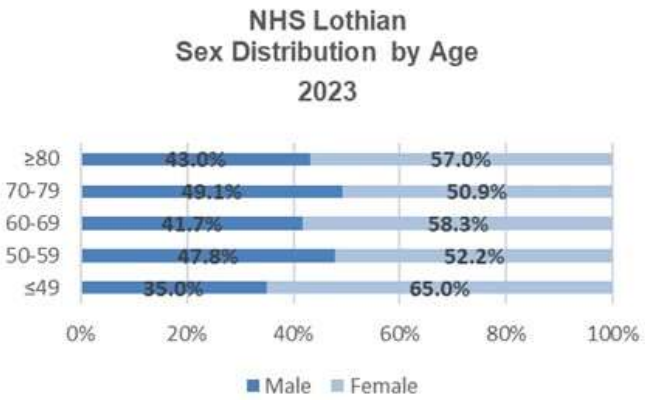
Tables: Patients diagnosed with lung cancer January to December 2023
Charts: Patients diagnosed with lung cancer January to December 2023 or cumulative results over a series of years as indicated.

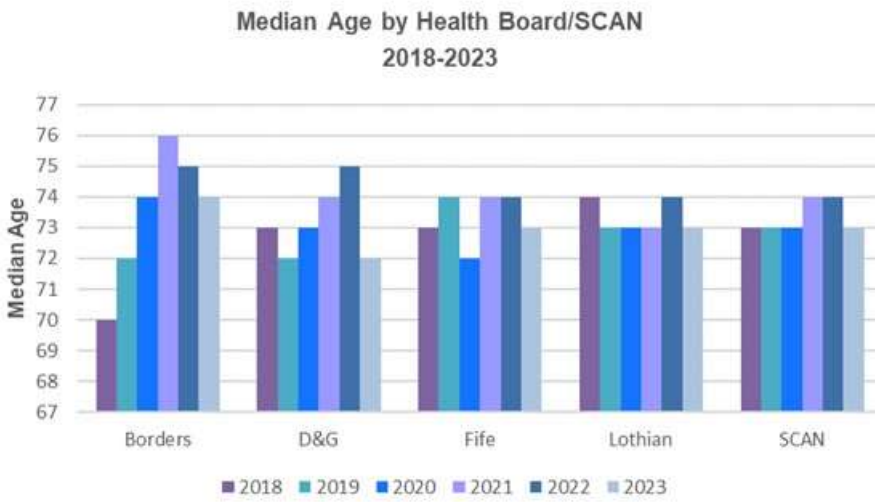
Age & Sex Distribution 2023	Borders	D&G	Fife	Lothian	SCAN
Age: Median	74	72	73	73	73
Age: Range	50-91	49-91	42-96	34-98	34-98

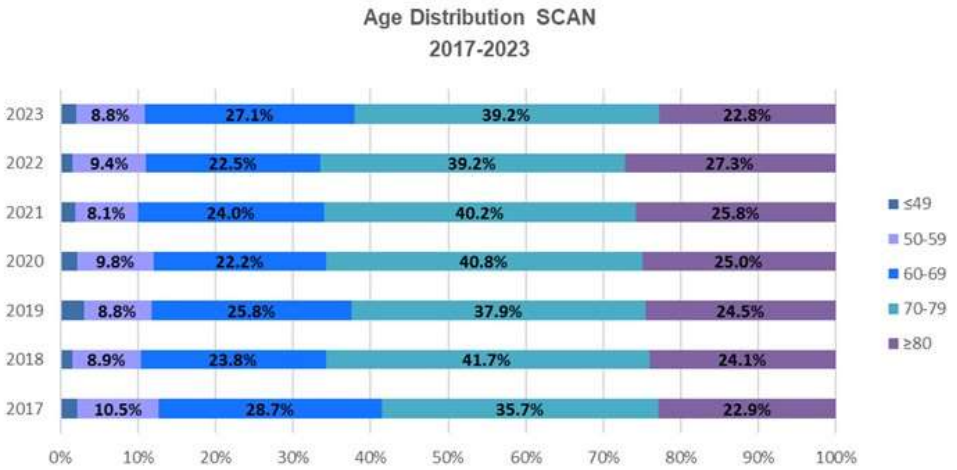






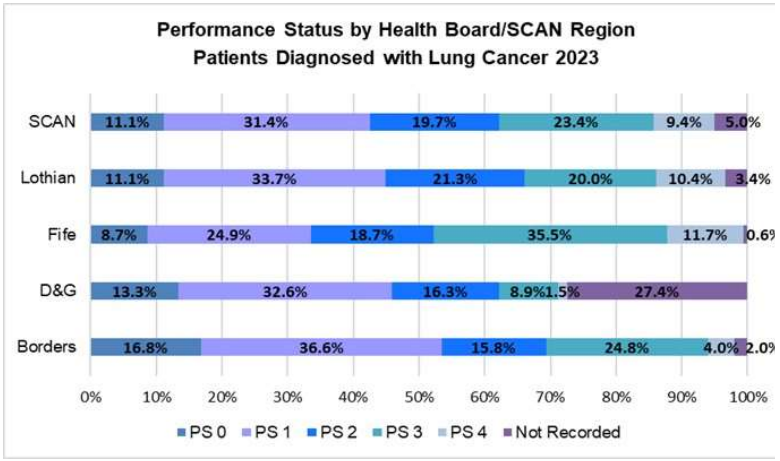




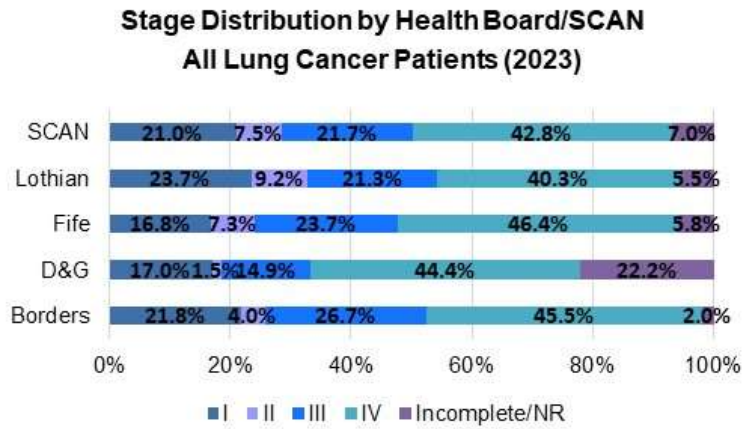


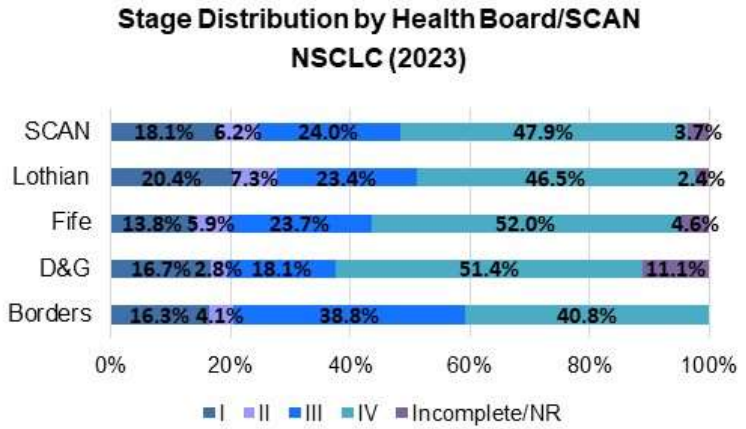
Performance Status (PS): All patients diagnosed with lung cancer 2023

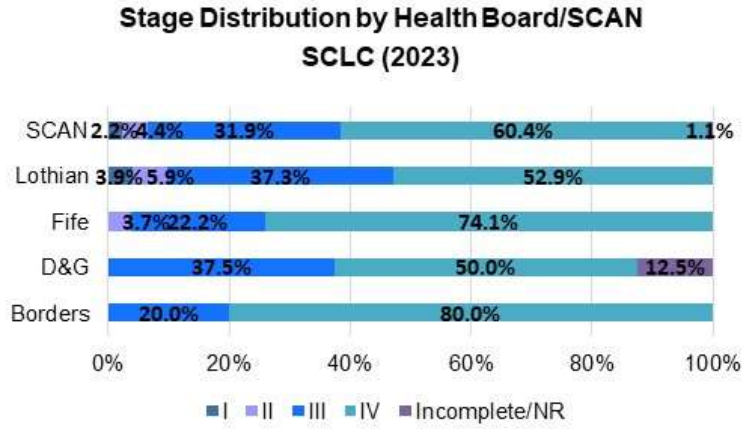
	Borders		D&G		Fife		Lothian		SCAN	
PS 0	17	16.8%	18	13.3%	31	8.7%	81	11.1%	147	11.1%
PS 1	37	36.6%	44	32.6%	89	24.9%	246	33.7%	416	31.4%
PS 2	16	15.8%	22	16.3%	67	18.7%	155	21.3%	260	19.7%
PS 3	25	24.8%	12	8.9%	127	35.5%	146	20.0%	310	23.4%
PS 4	4	4.0%	2	1.5%	42	11.7%	76	10.4%	124	9.4%
Not recorded	2	2.0%	37	27.4%	2	0.6%	25	3.4%	66	5.0%
Total	101		135		358		729		1323	

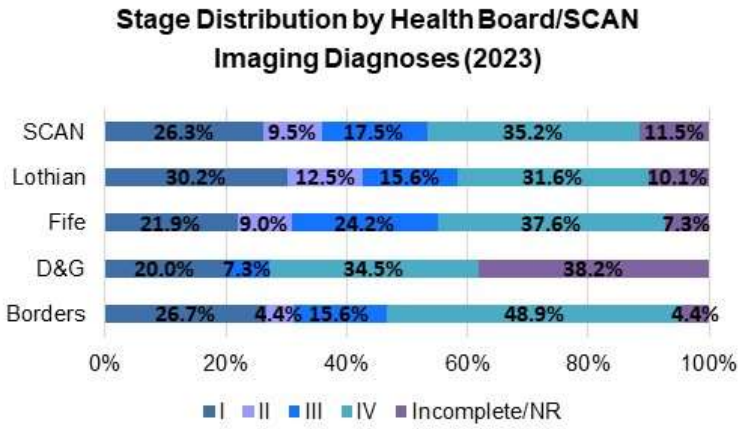


Stage Grouping: All patients diagnosed with lung cancer 2023	Borders		D&G		Fife		Lothian		SCAN	
I	22	21.8%	23	17.0%	60	16.8%	173	23.7%	278	21.0%
II	4	4.0%	2	1.5%	26	7.3%	67	9.2%	99	7.5%
III	27	26.7%	20	14.8%	85	23.7%	155	21.3%	287	21.7%
IV	46	45.5%	60	44.4%	166	46.4%	294	40.3%	566	42.8%
Incomplete	-	0.0%	7	5.2%	18	5.0%	8	1.1%	33	2.5%
Not recorded	2	2.0%	23	17.0%	3	0.8%	32	4.4%	60	4.5%
Total	101		135		358		729		1323	



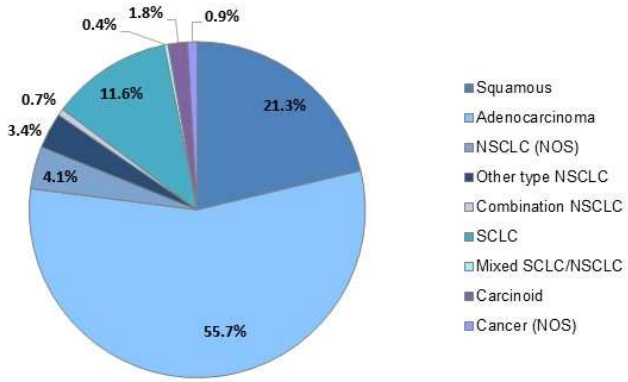




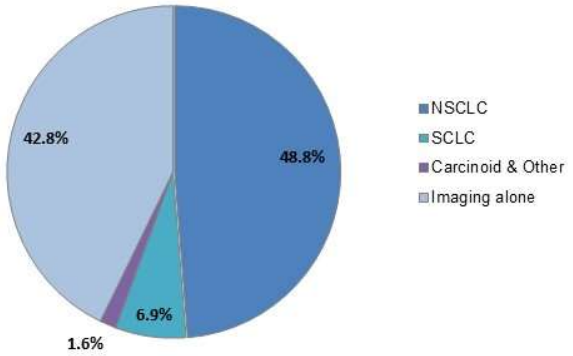


Pathology Type 2023	Borders		D&G		Fife		Lothian		SCAN	
Squamous	16	15.8%	13	9.6%	43	12.0%	89	12.2%	161	12.2%
Adenocarcinoma	30	29.7%	59	43.7%	86	24.0%	247	33.9%	422	31.9%
NSCLC (NOS)	2	2.0%	-	0.0%	16	4.5%	13	1.8%	31	2.3%
Other specific NSCLC	1	1.0%	-	0.0%	6	1.7%	19	2.6%	26	2.0%
NSCLC combination	-	0.0%	-	0.0%	1	0.3%	4	0.5%	5	0.4%
SCLC	5	5.0%	8	5.9%	25	7.0%	50	6.9%	88	6.7%
SCLC/NSCLC mixed	-	0.0%	-	0.0%	2	0.6%	1	0.1%	3	0.2%
Carcinoid	1	1.0%	-	0.0%	1	0.3%	12	1.6%	14	1.1%
Other malignancy	1	1.0%	-	0.0%	-	0.0%	6	0.8%	7	0.5%
Negative Pathology	1	1.0%	1	0.7%	6	1.7%	23	3.2%	31	2.3%
Declined Investigation	3	3.0%	7	5.2%	7	2.0%	49	6.7%	66	5.0%
No Pathology	41	40.6%	47	34.8%	165	46.1%	216	29.6%	469	35.4%
Not recorded	-	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%
NSCLC	49	48.5%	72	53.3%	152	42.5%	372	51.0%	645	48.8%
SCLC	5	5.0%	8	5.9%	27	7.5%	51	7.0%	91	6.9%
Carcinoid & other	2	2.0%	0	0.0%	1	0.3%	18	2.5%	21	1.6%
Radiological/Imaging diagnoses	45	44.6%	55	40.7%	178	49.7%	288	39.5%	566	42.8%

Pathology Subtypes Lung Cancer 2023
SCAN Region (n=757)

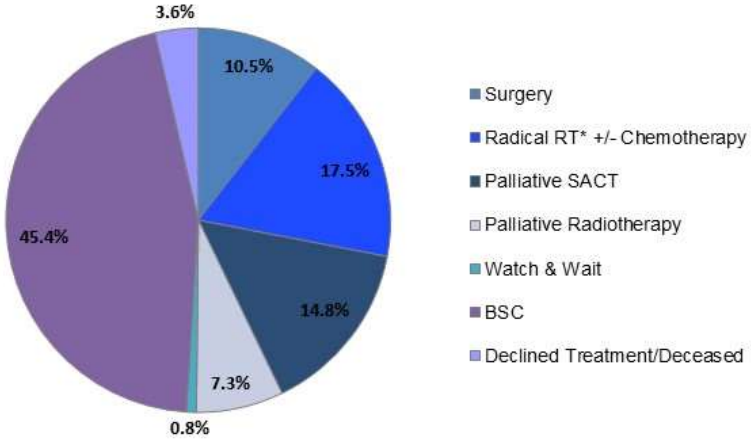


Pathological Diagnosis Lung Cancer 2023
SCAN Region (n=1323)

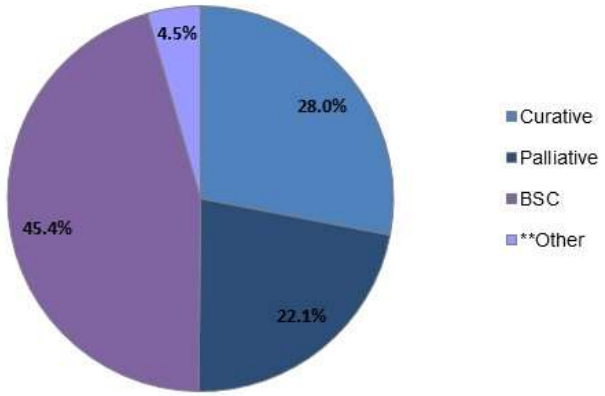


First Treatment 2023	Borders		D&G		Fife		Lothian		SCAN	
Surgery	9	8.9%	17	12.6%	19	5.3%	94	12.9%	139	10.5%
SABR	8	7.9%	4	3.0%	15	4.2%	54	7.4%	81	6.1%
Radical Radiotherapy	6	5.9%	8	5.9%	21	5.9%	44	6.0%	79	6.0%
Chemoradiotherapy	9	8.9%	7	5.2%	15	4.2%	41	5.6%	72	5.4%
Palliative Chemotherapy	-	0.0%	7	5.2%	14	3.9%	29	4.0%	50	3.8%
Chemoimmunotherapy	6	5.9%	-	0.0%	11	3.1%	37	5.1%	54	4.1%
Immunotherapy	2	2.0%	6	4.4%	11	3.1%	37	5.1%	56	4.2%
Targeted Therapy	5	5.0%	6	4.4%	6	1.7%	19	2.6%	36	2.7%
Palliative Radiotherapy	9	8.9%	15	11.1%	31	8.7%	42	5.8%	97	7.3%
Watchful Waiting	-	0.0%	-	0.0%	1	0.3%	10	1.4%	11	0.8%
Best Supportive Care (BSC)	42	41.6%	58	43.0%	192	53.6%	307	42.1%	599	45.3%
Declined all therapies	3	3.0%	2	1.5%	3	0.8%	3	0.4%	11	0.8%
Died before treatment	2	2.0%	5	3.7%	18	5.0%	12	1.6%	37	2.8%
Not recorded	-	0.0%	-	0.0%	1	0.3%	-	0.0%	1	0.1%
Total	**101**		**135**		**358**		**729**		**1323**	

First Treatment Lung Cancer 2023
SCAN Region (n=1323)



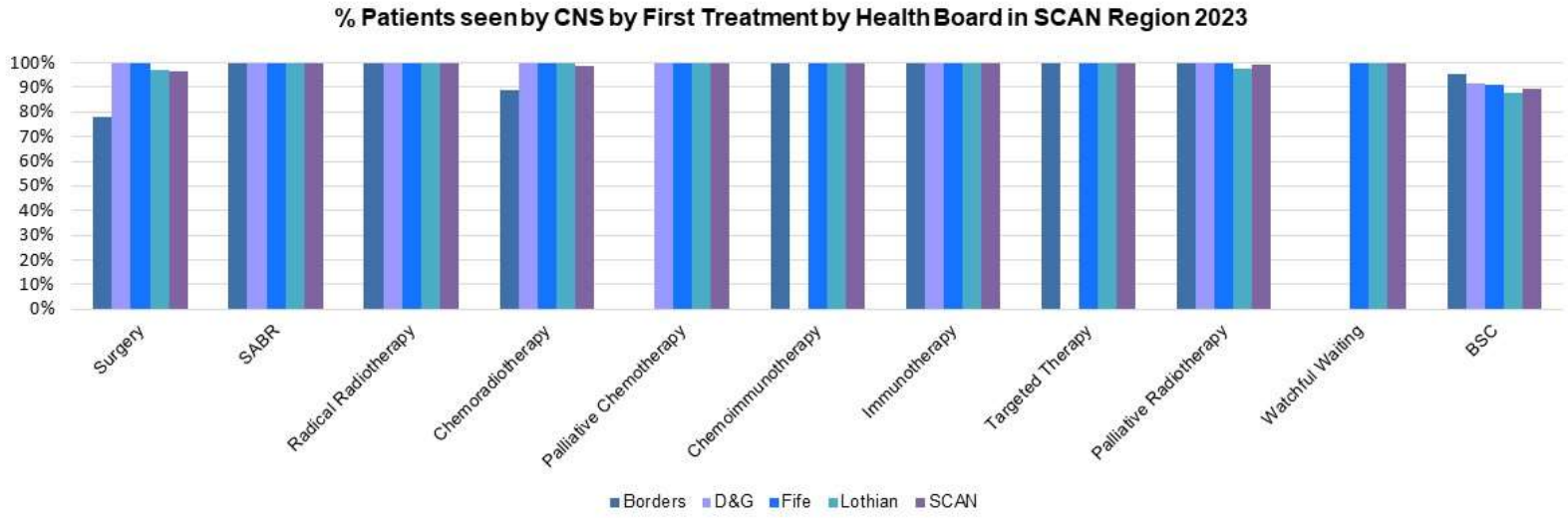
First Treatment Lung Cancer by Type 2023
SCAN Region (n=1323)



* Radical RT includes SABR or conventional radical radiotherapy

**Other = Watch & Wait, Declined Treatment, Deceased

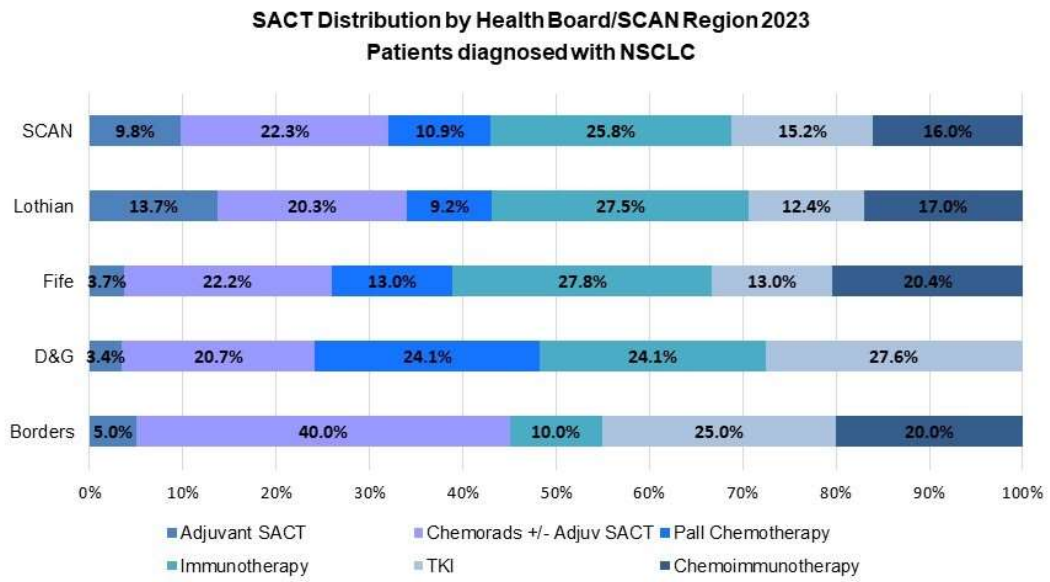
Lung Clinical Nurse Specialists 2023	Borders		D&G		Fife		Lothian		SCAN	
Contact with LCNS	95	94.1%	128	94.8%	334	93.3%	684	93.8%	1241	93.8%



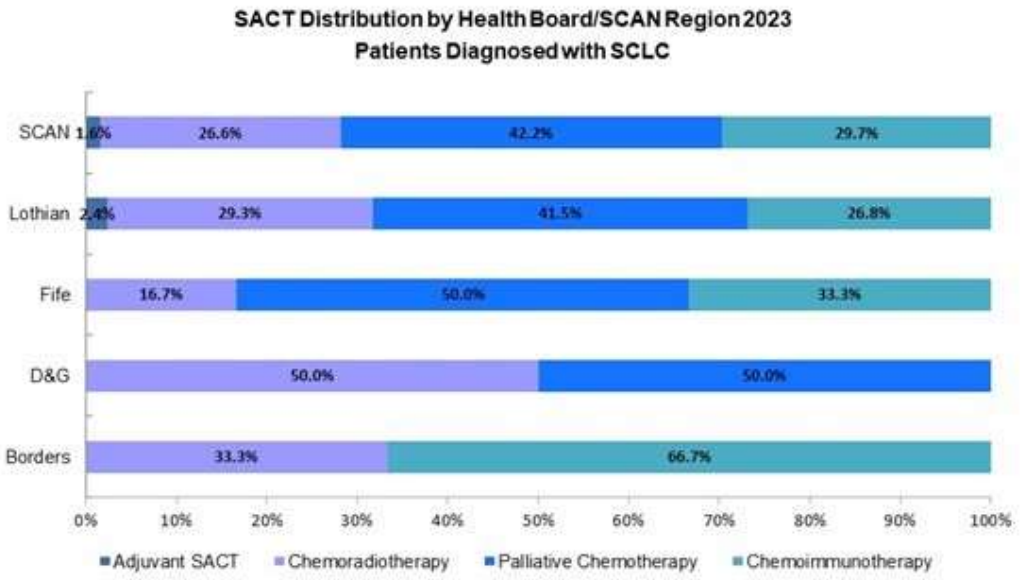
Surgical Resection 2023	Borders		D&G		Fife		Lothian		SCAN	
Pneumonectomy	-	0.0%	15	88.2%	1	5.3%	4	4.2%	20	14.3%
Lobectomy	6	66.7%	1	5.9%	17	89.5%	81	85.3%	105	75.0%
Wedge	3	33.3%	1	5.9%	1	5.3%	2	2.1%	7	5.0%
Segmental	-	0.0%	-	0.0%	-	0.0%	7	7.4%	7	5.0%
Other surgery	-	0.0%	-	0.0%	-	0.0%	1	1.1%	1	0.7%
Total	**9**		**17**		**19**		**95**		**140**	
Declined Surgery	-	0.0%	1	0.7%	1	0.3%	15	2.1%	17	1.3%
Died before Surgery	1	1.0%	-	0.0%	-	0.0%	-	0.0%	1	0.1%
% Lung Cancer Patients having Surgery		**8.9%**		**12.6**		**5.3%**		**13.0%**		**10.6%**

SACT: NSCLC 2023	Borders		D&G		Fife		Lothian		SCAN	
CURATIVE										
Adjuvant chemotherapy	1	5.0%	1	3.4%	2	3.7%	11	7.2%	15	5.9%
Adjuvant chemoimmunotherapy	-	0.0%	-	0.0%	-	0.0%	5	3.3%	5	2.0%
Adjuvant TKI	-	0.0%	-	0.0%	-	0.0%	4	2.6%	4	1.6%
Adjuvant immunotherapy	-	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%
Adjuvant chemoradiotherapy*	-	0.0%	-	0.0%	-	0.0%	1	0.7%	1	0.4%
Chemoradiotherapy*	4	20.0%	6	20.7%	4	7.4%	19	12.4%	33	12.9%
Chemoradiotherapy + adjuvant immunotherapy	4	20.0%	-	0.0%	8	14.8%	11	7.2%	23	9.0%
Chemoradiotherapy + adjuvant TKI	-	0.0%	-	0.0%	-	0.0%	1	0.7%	1	0.4%
PALLIATIVE										
Platinum doublet chemotherapy	-	0.0%	7	24.1%	7	13.0%	14	9.2%	28	10.9%
Single agent immunotherapy	2	10.0%	7	24.1%	15	27.8%	42	27.5%	66	25.8%
Palliative TKI	5	25.0%	8	27.6%	7	13.0%	19	12.4%	39	15.2%
Palliative chemoimmunotherapy	4	20.0%	-	0.0%	11	20.4%	26	17.0%	41	16.0%
TOTAL	**20**		29		54		**153**		256	
Declined SACT	-	0.0%	6	8.3%	7	4.6%	24	6.5%	37	5.7%
Patient died before SACT	-	0.0%	-	0.0%	-	0.0%	3	0.8%	3	0.5%
Distribution of SACT										
Curative	9	45.0%	7	24.1%	14	25.9%	52	34.0%	82	32.0%
Palliative	11	55.0%	22	75.9%	40	74.1%	101	66.0%	174	68.0%
Total NSCLC & % receiving SACT	**49**	40.8%	**72**	40.3%	**152**	35.5%	**372**	41.1%	**645**	39.7%

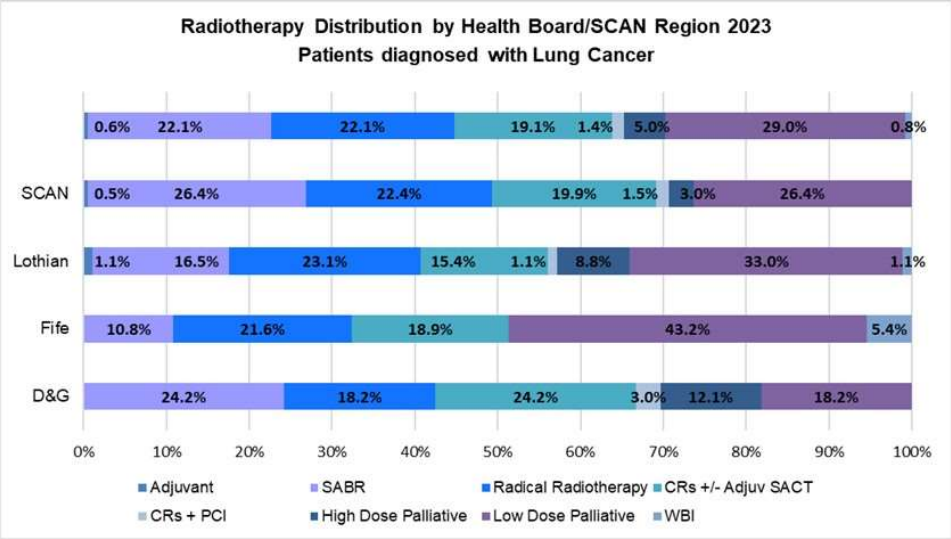
SACT Distribution by Health Board: Patients diagnosed with NSCLC in 2023



SACT: SCLC 2023	Borders		D&G		Fife		Lothian		SCAN	
Adjuvant* chemotherapy	-	0.0%	-	0.0%	-	0.0%	1	2.4%	1	1.6%
Radical Chemoradiotherapy	1	33.3%	1	50.0%	3	16.7%	12	29.3%	17	26.6%
Palliative chemotherapy	-	0.0%	1	50.0%	9	50.0%	17	41.5%	27	42.2%
Palliative chemoimmunotherapy	2	66.7%	-	0.0%	6	33.3%	11	26.8%	19	29.7%
TOTAL	3		2		18		41		64	
Declined SACT	1	20.0%	1	12.5%	-	0.0%	4	7.8%	6	6.6%
Patient died before SACT	-	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%
Total SCLC & % receiving SACT	**5**	**60.0%**	**8**	**25.0%**	**27**	**66.7%**	**51**	**80.4%**	**91**	**70.3%**



Radiotherapy: All Lung Cancer 2023	Borders		D&G		Fife		Lothian		SCAN	
Adjuvant radiotherapy	-	0.0%	-	0.0%	1	1.1%	1	0.5%	2	0.6%
Radical radiotherapy: SABR	8	24.2%	4	10.8%	15	16.5%	53	26.4%	80	22.1%
Radical radiotherapy: conventional	6	18.2%	8	21.6%	21	23.1%	45	22.4%	80	22.1%
Radical chemoradiotherapy (CR)	4	12.1%	4	10.8%	6	6.6%	28	13.9%	42	11.6%
CR + PCI	1	3.0%	-	0.0%	1	1.1%	3	1.5%	5	1.4%
CR + adjuvant Immunotherapy	4	12.1%	2	5.4%	7	7.7%	11	5.5%	24	6.6%
CR + adjuvant TKIs	-	0.0%	1	2.7%	1	1.1%	1	0.5%	3	0.8%
High dose palliative radiotherapy	4	12.1%	-	0.0%	8	8.8%	6	3.0%	18	5.0%
Low dose palliative radiotherapy	6	18.2%	16	43.2%	30	33.0%	53	26.4%	105	29.0%
Prophylactic Cranial Irradiation (PCI)	-	0.0%	2	5.4%	1	1.1%	-	0.0%	3	0.8%
TOTAL	**33**		**37**		**91**		**201**		**362**	
Declined radiotherapy	1	1.0%	4	3.0%	2	0.6%	7	1.0%	14	1.1%
Patient died before radiotherapy	-	0.0%	-	0.0%	4	1.1%	1	0.1%	5	0.4%
Distribution of Radiotherapy										
Radical	23	69.7%	19	51.4%	52	57.1%	142	70.6%	236	65.2%
Palliative	10	30.3%	18	48.6%	39	42.9%	59	29.4%	126	34.8%
Total lung cancer & % receiving RT	**101**	**32.7%**	**135**	**27.4%**	**358**	**25.4%**	**729**	**27.6%**	**1323**	**27.4%**



Appendix 2: Historical QPI Attainment Summary – 2022

Lung Cancer QPI Attainment Summary 2022		Target %	Borders		D&G		Fife		Lothian		SCAN	
QPI 1 MDT discussion		95	N 79 D 80	98.8%	N 145 D 146	99.3%	N 309 D 309	100%	N 744 D 778	95.6%	N 1277 D 1313	97.3%
QPI 2 Pathological Diagnosis	All patients with lung cancer	80	N 42 D 58	72.4%	N 68 D 123	55.3%	N 138 D 186	74.2%	N 388 D 505	76.8%	N 636 D 872	72.9%
	NSCLC with sub-type identified	90	N 38 D 41	92.7%	N 56 D 58	96.6%	N 121 D 129	93.8%	N 363 D 377	96.3%	N 578 D 605	95.5%
	Non-Squamous, III-IV: Oncogenic Profiling	80	N 22 D 25	88.0%	N 17 D 19	89.5%	N 60 D 67	89.6%	N 149 D 158	94.3%	N 248 D 269	92.2%
	NSCLC IIIB-IV: PDL1 testing	80	N 31 D 33	93.9%	N 29 D 33	87.9%	N 88 D 97	90.7%	N 214 D 226	94.7%	N 362 D 389	93.1%
QPI 4 PET CT for NSCLC within 10 days from request to report		95	N 0 D 10	0.0%	N 0 D 27	0.0%	N 7 D 47	14.9%	N 21 D 161	13.0%	N 28 D 245	11.4%
QPI 5 Nodal Sampling to confirm Mediastinal Malignancy		80	N 2 D 3	66.7%	N 8 D 11	72.7%	N 11 D 17	64.7%	N 45 D 51	88.2%	N 66 D 82	80.5%
*QPI 6 Surgical resection in NSCLC	All NSCLC	20	N 4 D 39	10.3%	N 12 D 58	20.7%	N 20 D 129	15.5%	N 107 D 377	28.4%	N 143 D 603	23.7%
	NSCLC stage I-II	60	N 4 D 8	50.0%	N 10 D 16	62.5%	N 15 D 24	62.5%	N 92 D 135	68.1%	N 121 D 183	66.1%
*QPI 7 Lymph node assessment for NSCLC patients having pneumonectomy or lobectomy		80	Analysis is by Hospital of Surgery – RIE:						N 107 D 130	82.3%	n/a	
QPI 8 Radiotherapy (including SABR) for inoperable lung cancer		35	N 6 D 17	35.3%	N 15 D 22	68.2%	N 37 D 88	42.0%	N 94 D 202	46.5%	N 152 D 329	46.2%
QPI 9 Chemoradiotherapy for locally advanced NSCLC		50	N 1 D 1	100%	N 2 D 4	50.0%	N 2 D 6	33.3%	N 5 D 13	38.5%	N 10 D 24	41.7%
QPI 10 Chemoradiotherapy for limited stage SCLC		70	N 0 D 0	n/a	N 0 D 0	n/a	N 2 D 4	50.0%	N 5 D 6	83.3%	N 7 D 10	70.0%
QPI 11 SACT for patients with NSCLC	All types of SACT for NSCLC	35	N 12 D 32	37.5%	N 15 D 44	34.1%	N 39 D 99	39.4%	N 102 D 239	42.7%	N 168 D 414	40.6%
	Targeted Therapy for NSCLC, stages IIIB-IV	80	N 2 D 3	66.7%	N 1 D 1	100%	N 5 D 6	83.3%	N 14 D 16	87.5%	N 22 D 26	84.6%

Lung Cancer QPI Attainment Summary 2022		Target %	Borders	D&G	Fife	Lothian	SCAN
	Immunotherapy for NSCLC, stages IIIB-IV	40	N 1 D 8 12.5%	N 2 D 6 33.3%	N 13 D 31 41.9%	N 44 D 70 62.9%	N 60 D 115 52.2%
QPI 12 SACT for patients with SCLC	All types of chemotherapy for SCLC	70	N 6 D 8 75.0%	N 5 D 9 55.6%	N 17 D 26 65.4%	N 40 D 59 67.8%	N 68 D 102 66.7%
	Palliative chemotherapy for SCLC for treatment with non-curative intent	50	N 5 D 7 71.4%	N 4 D 8 50.0%	N 12 D 20 60.0%	N 29 D 47 61.7%	N 50 D 82 61.0%
*QPI 13.1 30 Day Mortality After Treatment	*Surgery	<5	Analysis is by Hospital of Surgery – RIE:			N 1 D 161 0.6%	n/a
	Radical Radiotherapy	<5	N 0 D 5 0.0%	N 1 D 19 5.3%	N 0 D 43 0.0%	N 0 D 97 0.0%	N 1 D 164 0.6%
	Chemoradiotherapy	<5	N 0 D 4 0.0%	N 0 D 6 0.0%	N 1 D 14 7.1%	N 0 D 29 0.0%	N 1 D 53 1.9%
	Adjuvant Chemotherapy	<5	Centralised reports are available from PHS (30-day mortality after systemic anti-cancer therapy (SACT) - patients treated in 2022 - 30-day mortality after systemic anti-cancer therapy (SACT) - Publications - Public Health Scotland)				
	Palliative Chemotherapy (NSCLC)	<10					
	Palliative Chemotherapy (SCLC)	<15					
	Biological Therapy (NSCLC)	<10					
*QPI 13.2 90 Day Mortality After Treatment	*Surgery	<5	Analysis is by Hospital of Surgery – RIE:			N 1 D 161 0.6%	n/a
	Radical Radiotherapy	<5	N 1 D 5 20.0%	N 1 D 19 5.3%	N 0 D 42 0.0%	N 4 D 97 4.1%	N 6 D 163 3.7%
	Chemoradiotherapy	<5	N 1 D 4 25.0%	N 1 D 6 16.7%	N 2 D 14 14.3%	N 1 D 29 3.4%	N 5 D 53 9.4%
QPI 14 SABR for Inoperable Lung Cancer with Stage I Disease		35	N 4 D 7 57.1%	N 6 D 9 66.7%	N 12 D 49 24.5%	N 46 D 124 37.1%	N 68 D 189 36.0%
QPI 15 Cytological / Histological Diagnosis Prior to Definitive Treatment	i. Surgery	75	N 4 D 4 100%	N 11 D 12 91.7%	N 15 D 23 65.2%	N 76 D 116 65.5%	N 106 D 155 68.4%
	ii. Radical Radiotherapy	75	N 2 D 5 40.0%	N 12 D 19 63.2%	N 21 D 43 48.8%	N 45 D 96 46.9%	N 80 D 163 49.1%
QPI 16 Contrast CT/MRI for N2 Patients Prior to Definitive Treatment		95	N 3 D 3 100%	N 5 D 7 71.4%	N 9 D 12 75.0%	N 27 D 27 100%	N 44 D 49 89.8%

Lung Cancer QPI Attainment Summary 2022	Target %	Borders	D&G	Fife	Lothian	SCAN
Clinical Trials Patients consented to trials/research and held on SCRN database.	15	Centralised report will be available from the Clinical Trials Team in due course.				
Target Met		Target Not Met			Not applicable	

* D&G patients have surgery at Golden Jubilee Hospital, Clydebank and are therefore included in WOSCAN's (West of Scotland Cancer Network) report for QPIs 7, 13(i) and 13(ii) – all being reported by HOSPITAL OF SURGERY.
All patients in NHS Borders, Fife and Lothian have thoracic surgery at the Royal Infirmary of Edinburgh (RIE).
Some patients from outwith the SCAN area have surgery at RIE, e.g. patients referred from Tayside. These are identified throughout the report as required.
SCAN totals are therefore not appropriate for QPIs 7 & 13(i) & 13(ii) and are marked as "n/a".

Detailed information regarding PS, TNM and stage groupings can be found in Appendices 3, 4 and 5 respectively.

Note: Allowance should be made where small numbers and variation may be due to chance and manifest as disproportionate percentages, which can distort results both positively and negatively. These should be viewed with a degree of caution.

Appendix 3: Performance Status

WHO/ECOG PERFORMANCE STATUS (PS) CATEGORIES

0 Fully active. Able to carry on all pre-disease performance without restriction.

1 Restricted in physically strenuous activities but ambulatory and able to carry out work of a light and sedentary nature.

2 Ambulatory and capable of all self-care but unable to carry out many work activities; up and about more than 50% waking hours.

3 Capable of only limited self-care; confined to bed or a chair for more than 50% of waking hours.

4 Completely disabled; unable to carry out any self-care; totally confined to bed or a chair.

Appendix 4: TNM Stage Groups
(TNM Classification of Malignant Tumours, 8th Edition, IASLC, 2016)

Stage Group	Tumour	Nodal	Metastases
Occult carcinoma	Tx	N0	M0
Stage 0	Tis	N0	M0
Stage IA1	T1(mi)	N0	M0
	T1a	N0	M0
StageIA2	T1b	N0	M0
Stage IA3	T1c	N0	M0
Stage IB	T2a	N0	M0
Stage IIA	T2b	N0	M0
Stage IIB	T1a-c	N1	M0
	T2a-b	N1	M0
	T3	N0	M0
Stage IIIA	T1a-c	N2	M0
	T2a-b	N2	M0
	T3	N1	M0
	T4	N0-N1	M0
Stage IIIB	T1a-c	N3	M0
	T2a-b	N3	M0
	T3	N2	M0
	T4	N2	M0
Stage IIIC	T3-T4	N3	M0
Stage IVA	Any T	Any N	M1a-b
Stage IVB	Any T	Any N	M1c

Appendix 5: TNM Classification

TNM Classification of Malignant Tumours, 8th Edition, International Association for the Study of Lung Cancer (IASLC), 2017

T – Primary Tumour		
Tx	Primary tumour cannot be assessed, or tumour proven by the presence of malignant cells in sputum or bronchial washings but not visualized by imaging or bronchoscopy.	
T0	No evidence of primary tumour.	
Tis	Carcinoma in situ	
T1	Tumour 3cm or less in greatest dimension, surrounded by lung or visceral pleura, without bronchoscopic evidence of invasion more proximal than the lobar bronchus (i.e. not in main bronchus).	
	T1(mi)	Minimally invasive adenocarcinoma.
	T1a	Tumour 1cm or less in greatest dimension.
	T1b	Tumour more than 1cm but not more than 2cm in greatest dimension.
	T1c	Tumour more than 2cm but not more than 3cm in greatest dimension.
T2	Tumour more than 3cm but not more than 5cm; or tumour with any of the following features: ○ Involves main bronchus regardless of distance from the carina, but without involvement of the carina. ○ Invades visceral pleura. ○ Associated with atelectasis or obstructive pneumonitis that extends to the hilar region, involving part or all of the lung.	
	T2a	Tumour more than 3cm but not more than 4cm in greatest dimension.
	T2b	Tumour more than 4cm but not more than 5cm in greatest dimension.
T3	Tumour more than 5cm but not more than 7cm in greatest dimension or directly invades any of the following structures: ○ chest wall (including parietal pleura and superior sulcus tumours) ○ phrenic nerve ○ parietal pericardium ○ or associated with separate tumour nodule(s) in the same lobe as the primary.	
T4	Tumour more than 7cm in greatest dimension or invades any of the following structures: ○ diaphragm, mediastinum, heart, great vessels, trachea, recurrent laryngeal nerve, oesophagus, vertebral body, carina, or ○ associated with separate tumour nodule(s) in different ipsilateral lobe to that of the primary tumour.	
N – Regional Lymph Nodes		
Nx	Regional Lymph nodes cannot be assessed.	
N0	No regional lymph node metastasis.	
N1	Metastasis in ipsilateral peribronchial and/or ipsilateral hilar and intrapulmonary lymph nodes, including by direct extension.	
N2	Metastasis in ipsilateral mediastinal and/or subcarinal lymph node(s).	
N3	Metastasis in contralateral mediastinal, contralateral hilar, ipsilateral, or contralateral scalene, or supraclavicular lymph node(s).	
M – Distant Metastasis		
M0	No distant metastasis.	
M1	Distant metastasis present.	
	M1a	Separate tumour nodule(s) in a contralateral lobe; tumour with pleural or pericardial nodule(s) or malignant pleural or pericardial effusion.
	M1b	Single extrathoracic metastasis.
	M1c	Multiple extrathoracic metastases in one or several organs.

Appendix 6: Acknowledgements

Clinical and Audit Staff who contributed to the Lung Cancer Comparative Report 2023.

Name	Designation	SCAN Health Board / Edinburgh Cancer Centre
Ahsan Akram	Consultant Respiratory Physician	NHS Lothian
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Fraser Wood	Consultant Respiratory Physician	
Vipin Zamvar	Consultant Cardio-thoracic Surgeon	NHS Lothian

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