SCAN
South East Scotland Cancer Network

NHS SCOTLAND

Working regionally to improve cancer services

SOUTH EAST SCOTLAND CANCER NETWORK
PROSPECTIVE CANCER AUDIT

Lung Cancer 2022
QPI Comparative Audit Report

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SCAN Report Index Number: SAL0324w

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CONTENTS

Document History

Version	Circulation	Date	Comments
Version 1	Lead Clinicians	October 2023	Draft results and outliers circulated in individual SCAN Health Boards.
Version 1.1	Lead Clinician & Regional Audit/Sign Off Sub Group	22/11/2023	To clarify Actions and provide and/or agree outstanding clinical commentary.
Version 2	To Lead Clinician	19/01/2024	Report to Lead Clinician to provide “Chair Summary”.
Version 3	To SCAN Lung Group.	23/04/2024	To SCAN Lung Group for final approval.
Final SCAN Report Index SAL0324	SCAN Lung Group SCAN Governance Framework SCAN Action Plan Board Leads	23/05/2024	Any potentially disclosive data to be removed prior to publication on SCAN Website.
Version 4W	Report published to SCAN Website	27/12/2024	

Chair Summary

SCAN Lung Cancer 2022
Quality Performance Indicators (QPI) Comparative Report
Comment by Chair of the SCAN Lung Group

QPIs help us drive up standards by reviewing our processes and particularly examining unexplained variance. Quality Performance indicators tell us a great deal about the patient pathway and access to treatments but not yet about outcomes e.g. survival (with Public Health Scotland (PHS)) or timelines on that pathway (devolved to waiting times initiative and collected separately). QPIs should be seen within that context and with careful note of any harm (e.g. 30- and 90-day mortality) against any potential benefit.

QPI 12 (Systemic anti-cancer treatment (SACT) rates for small cell lung cancer (SCLC)) have been a concern over several years, particularly for NHS Lothian and concerns have been raised that patients with SCLC may have too long a pathway to diagnosis and deteriorate before they can be offered palliative SACT. Following a detailed audit provided in the 2020 report and to give the best possible chance of treatment, a 'SCLC' alert system from Lothian pathology to oncology was implemented in October 2020 to tighten this pathway further. This saw QPI 12 passed in all health boards for the first time in 2022, however this has slipped again in 2022. I am grateful for Dr Ahsan Akram for their detailed review of the Lothian 2022 SCLC patient pathways who did not meet the QPI 12 standard and a summary of that review is attached with actions.

Pathological diagnosis remains challenging nationally for lung cancer and has been the subject of a number of reviews in previous reports. Herder score, using positron emission tomography (PET) data, is now a valid alternative for small nodules <300mm^3. This gives comfort that patients with a high probability of lung cancer from a high Herder score, who cannot have a biopsy, are being given treatment. Use of Herder score as an alternative to histology in selected cases will be taken to the next formal QPI review in October 2024.

QPIs are always a work in progress and the second round (after year 7 of reporting) of lung cancer QPI reviews led to the publication of Formal Review Cycle 2 (FR2) amendments, pertaining to lung cancer QPIs applicable to 2020/2021 reporting. We make some references to the changed and new QPIs throughout the report. These new QPIs acknowledge new treatment options, for example immunotherapy. QPI review 3 is due in October 2024.

QPI 4 in particular was changed to include a timeline, which has been challenging to meet on the first 2 years of reporting. A pilot of prebooked slots for PET, particularly for patients with stage III disease, is underway at WGH, NHS Lothian.

The QPI data have been collected, checked, considered, and critiqued across the Network by many hard-working individuals and my sincerest thanks to them.

With all my thanks and best for the coming year,

Melanie Mackean, April 2024

Clinical Action Plans

2022 Action Plan

QPI	Action required	Person Responsible	Date for update
QPI 2 (i)	Pathological Diagnosis: The target continues to be challenging. • Performance Status to be documented at MDT meetings to allow patients to be accurately recorded as exclusions for pathology or in the numerator (i.e. pathology and PS both obtained). • Herder score to continue to be documented at MDT for patients with PET CT nodules >8mm and <30mm and to be reported in audit database. Auditing this data will give valuable guidance when designing streamline pathways to cope with increasing numbers of lung nodule referrals when lung cancer screening services are in place.	Lung cancer MDT leads Lothian: Dr Phil Reid, Dr John McCafferty Fife: Dr Iain Murray D&G: Dr Wasib Shah Borders: Dr Sunny Jabbal	Q4 2024
QPI 2 (ii), (iii), & (iv)	All health boards are consistently exceeding the target year on year. To archive at next Formal Review (Autumn 2024)	SCAN audit team	QPI Formal Review 3 October 2024
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 Phil Reid, Lothian	Q4 2024
QPI 5	Sampling and the need for complete/full staging can be crucial to oncology treatment decision-making. NHS Borders, D&G and Fife are to undertake local audits to consider why nodes are not fully sampled and staged. (Target achieved by NHS Lothian – audit not required)	Health Board Clinical Leads: Borders, D&G and Fife	Q4 2024

QPI	Action required	Person Responsible	Date for update
QPI 6 (i)	Target 20%, Fife 15.5% (109 outliers) Audit to be undertaken to check Fife results (proposed by Dr Iain Murray, Clinical Lead, NHS Fife.	Dr Iain Murray	Q4 2024
QPI 7	3 x N2 stations should be sampled – this target was not met in 2021 and although passed in 2022, differences were noted between RIE and WGH/St John's outcomes. Inter-hospital audit over last 3 years to account for unexplained differences.	Mr Anthony Chambers, RIE surgical team	Q4 2024
QPI 12 (i)	In Lothian, a detailed review of outliers noted that some pathways appeared overly long (QPI measures SCLC receive chemotherapy +/- radiotherapy), and not urgently arranged. Audits to be carried out in NHS D&G, Fife, and Lothian. (Target achieved by NHS Borders – audit not required) <u>Action</u>: Recommendation from NHS Lothian audit: Investigations must be organised as "urgent" to counteract any potential delays.	Lothian - Dr Ahsan Akram. Completed Feb 2024 Fife – Dr Iain Murray. Completed April 2024 Health Board Clinical Leads: Borders, and D&G.	To share at next SCAN meeting 2024
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. Discussion around curative treatment 'packages' within 30- and 90-day mortality analyses and reporting, is to be taken to the next formal review process (Autumn 2024).	SCAN audit team	QPI Formal Review 3 October 2024
QPI 15 (i) & 15 (ii)	Pathological Diagnosis prior to surgery & radical radiotherapy: The target continues to be challenging. There are 2 components: 1. Lothian audits to be undertaken for 15(i) & 15(ii). 2. Herder score to continue to be documented at MDT for patients with PET CT nodules >8mm and <30mm and to be reported in audit database.	1.Dr Adam Marshall 2.Lung cancer MDT leads Lothian: Dr Phil Reid, Dr John McCafferty Fife: Dr Iain Murray D&G: Dr Wasib Shah Borders: Dr Sunny Jabbal	Q4 2024

QPI	Action required	Person Responsible	Date for update
	Auditing this data will give valuable guidance when designing streamline pathways to cope with increasing numbers of lung nodule referrals when lung cancer screening services are in place.		
QPI 16	The impact of very small numbers was noted. Stage is crucial: Denominator = patients with N2 disease. NHS Fife: Change in practice at MDT to ensure treatment intent is fully discussed and that any doubts over treatment intent are documented. NHS D&G: Stage to be recorded at MDT meetings.	NHS Fife: Dr Iain Murray NHS D&G: Dr Wasib Shah	Q4 2024
Key Category Section (Appendix 1) Impacts on QPIs 2, 5, 6, 8, 9, 10, 11, 14 & 16	TNM staging and PS data should be recorded at local MDT meetings. Results for NHS Dumfries & Galloway have declined over the 4-year period 2019-2022. SCAN HBs should ensure that these data items are reported due to PS & staging being important selection criteria in several QPI denominators.	NHS D&G: Dr Wasib Shah	SCAN Lung Group meeting Q4 2024
General	Case Ascertainment levels are not as high as they should be and a general decline is demonstrated across the last five years. High levels of case ascertainment are essential to: 1. provide confidence in the completeness of data, 2. contribute to the reliability of results presented. Local audits are to be carried out by the SCAN lung cancer audit team to compare data with Cancer Registry and to identify areas for improvement. An SOP is to be created to promote good practice and improve case ascertainment levels.	SCAN audit team	June 2024

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 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%
	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%

Lung Cancer QPI Attainment Summary 2022		Target %	Borders		D&G		Fife		Lothian		SCAN	
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%
*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%

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 2021

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 2022 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; 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 (previously ISD) 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 eighth 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 unfortunately 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
2 (iv)	**New QPI:** to measure PDL1 testing. This QPI uses existing data items and codes.	2020

[1] QPI documents are available at www.healthcareimprovementscotland.org
[2] Datasets and measurability documents are available at https://www.isdscotland.org/Health-Topics/Cancer/Cancer-Audit/

QPI	Change	Year of reporting
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 attack cancer cells to prevent them from growing and dividing.

Audit Process

Data was 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 Melanie Mackean	Ailsa Patrizio
NHS Borders	Borders General Hospital (BGH)	Dr Kris Skwarski Dr Hosni El Taweel	Leanne Robinson
NHS Dumfries & Galloway	Dumfries & Galloway Royal Infirmary (DRI)	Dr Jane Gysin	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.

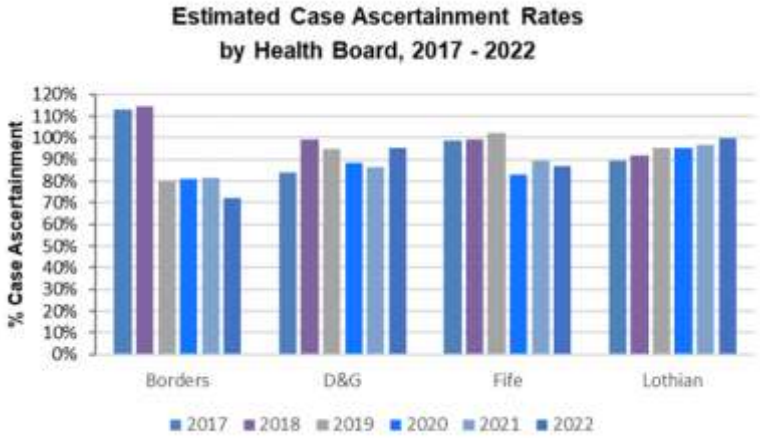
Estimated case ascertainment is based on the most recent 5-year average available from Scottish Cancer Registry data and excludes death certificate only registrations.

Estimate of case ascertainment is calculated using the average of the most recent available 5 years of Cancer Registry data (2017-2021) and measured against the most recent year (2022) in audit.

	Borders	D&G	Fife	Lothian	SCAN
Number of cases in audit cohort	80	146	309	778	1313
Average from Cancer Registry (2017-2021)	111	153	356	781	1401
Estimated Case Ascertainment 2022	**72.1%**	**95.4%**	**86.8%**	**99.6%**	**93.7%**

Source: Scottish Cancer Registry, PHS. Data extracted from ACaDMe: 05/11/2023.

Historical case ascertainment results by HB are as follows:

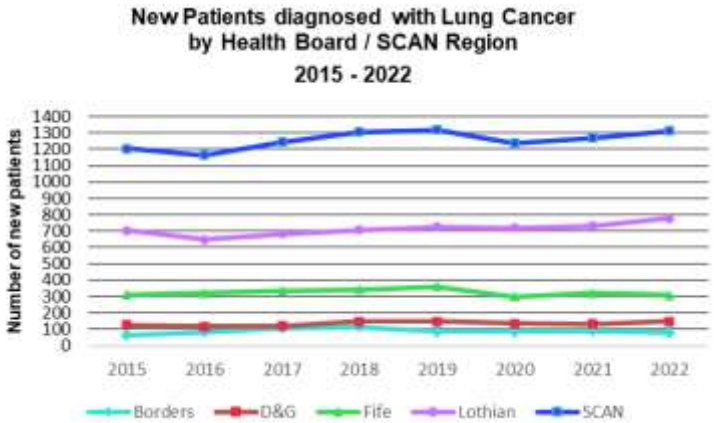


Case ascertainment levels over time show a degree of variation in health boards across the SCAN region. High levels of case ascertainment are required to provide confidence in the completeness of audit recording and contribute to the reliability of results presented.

Action: To investigate the differences between cancer registry and audit data to identify any limitations or anomalies. To scrutinise data checking procedures, i.e. checks against pathology listings, GRO records, et cetera across SCAN health boards with the aim of promoting more consistent practice and to improve ECA going forward.

In the most recent period (1st January to 31st December 2022) 1313 patients were diagnosed with lung cancer (ICD-codes: C33, C34) in the SCAN region, and by health board:

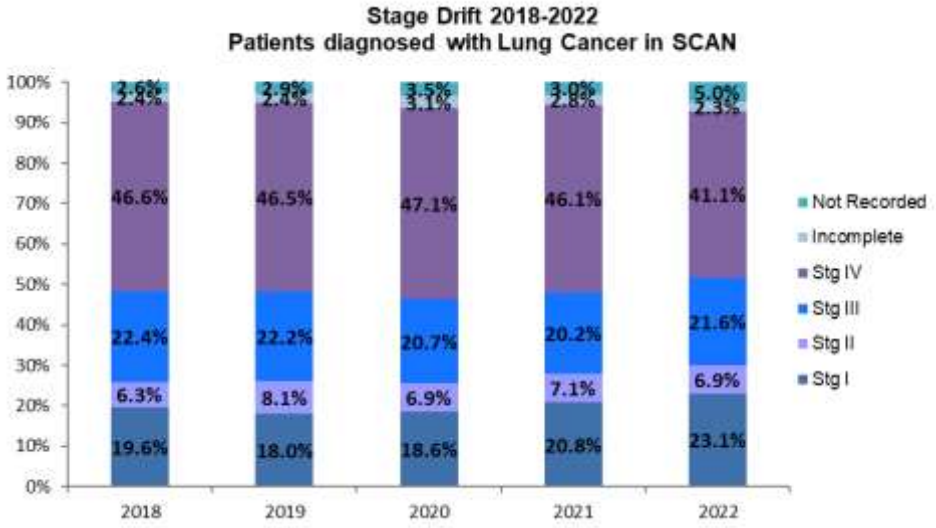
	Patients diagnosed 01/01/2022 to 31/12/2022				
	Borders	D&G	Fife	Lothian	SCAN
Number of cases in audit cohort	80	146	309	778	1313



Numbers of patients mainly fell in 2020, likely as a consequence of the Covid-19 pandemic. The Covid-19 pandemic had a wide impact on all cancer types in Scotland with widespread

disruption from the end of March 2020. The *Detect Cancer Early Staging Data (Year 10) & Impact of COVID-19*[4] official statistics were published by Public Health Scotland (PHS) on 25th October 2022.

Reassuringly early-stage rates (stage I and II) are improving. In 2022 early-stage diagnoses account for 30.0% of cases compared to 27.9%, 25.5%, 26.1% and 25.9% in the preceding 4 years.



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 Lung Sign off Meeting on 22nd November 2023, 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 April 2024.
- The Final report was circulated to Clinical Governance Groups and SCAN Action Plan Board Leads May 2024.

[4] Detect cancer early staging data - Year 10 and Impact of COVID-19 - Detect cancer early staging data - Publications - Public Health Scotland

- 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, cardio-thoracic 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 used to drive improvement in patients' pathways and outcomes, they should not be the sole benchmark for measuring patient care. Key category data, which facilitates measurement of data not specifically included in the QPI process, must also be given due consideration. The SCAN Lung Group has endorsed that this report adopt a methodology which explores a selection of *key categories* in conjunction with QPIs. Not only does this provide a more comprehensive analyses but also aids identification of ways to improve cancer services at HB level, with particular attention to the Scottish Government's Cancer Strategy 2023-2033[5]; a strategy which sets out our vision to improve cancer survival and provide excellent, equitably accessible care. Key data are discussed and a summary provided in appendix 1.

1. Data Completeness of Key Parameters

Specific key categories are vital to endorse standards of care and drive improvements, for example: performance status (PS) and staging, are key parameters in the selection of optimal treatment management. High data completeness levels for staging and PS ensure analyses are more thorough and more accurate. There is not, however, a Scottish 'standard' to measure against but if we align with National Lung Cancer Audit (NLCA)[6], we find data completeness targets for staging and PS recommended as being at least 95%. Data completeness by health board from 2019 - 2022 are as follows:

	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%
NLCA Target	95.0%	95.0%	95.0%	95.0%

	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%	58.8%	96.9%	96.0%
2022	100.0%	53.4%	98.4%	94.9%
NLCA Target	95%	95%	95%	95%

Many QPIs specify staging and/or performance status as denominator-specific criteria and it is vital that these data items are recorded to ensure comprehensive and accurate QPI measurement. Results, as shown above, are generally favourable with the exception of NHS Dumfries & Galloway. An Action has been recommended that these data items are recorded at local MDT meetings.

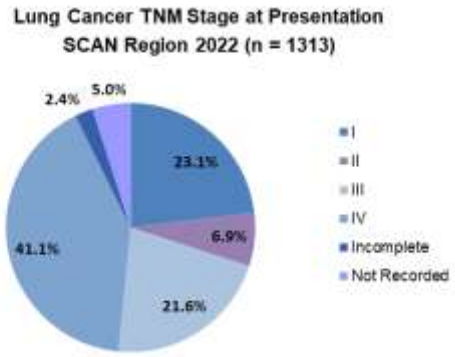
Action: all TNM staging and performance status should be recorded at local MDT meetings and is currently being implemented in NHS Dumfries & Galloway; and continued by other HBs.

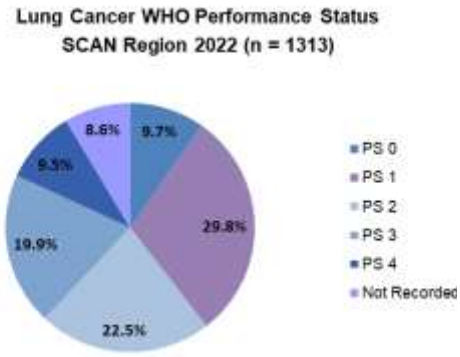
[5] Scottish Government (2023): *Cancer Strategy 2023-2022*. Cancer strategy 2023 to 2033 - gov.scot (www.gov.scot)

[6] The NCLA analyses and reports on data in England & Wales, with submissions from Northern Ireland and Guernsey. Scotland no longer submits data because the QPI method of reporting is not compatible with measurements and reporting utilized in the NLCA Report.

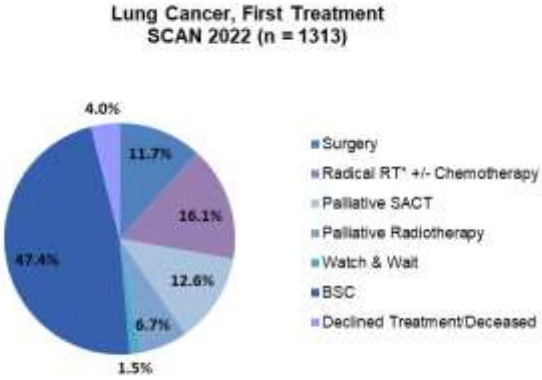
2. Staging and Performance Status

Overall in SCAN region in 2022, 41% of patients with lung cancer were diagnosed at an advanced stage (cp 46% in 2021) and patients tended to be more frail with 60% (58% in 2021) WHO PS 2 or above.





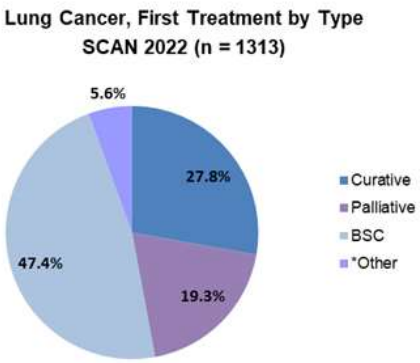
3. First treatment types



(Treatment by health board and stage are included in Appendix 1)

The pie chart on the left illustrates first treatment rates. It clearly shows that, sadly in SCAN, for just over 47% of patients, the commonest experience of lung cancer is that they are too unwell for any active interventions and receive Best Supportive Care (BSC).
This gives a clear message that more needs to be done to detect lung cancer earlier ((DCE): a Scottish Government Campaign[7]) which includes the undertaking of a targeted lung cancer screening pilot which started in 2022 in NHS Lothian.

- Curative treatment includes surgery, radical radiotherapy and chemoradiotherapy.
- Palliative treatment includes palliative radiotherapy, and palliative SACT which includes palliative chemotherapy, targeted therapy, immunotherapy and chemoimmunotherapy.
- *Other covers watch & wait, declined treatment and patients who died before treatment.

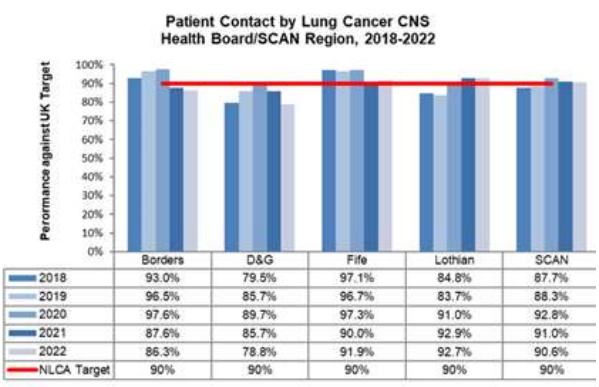


[7] Information regarding the DCE Scottish Government Campaign can be found at https://www.isdscotland.org/Health-Topics/Cancer/Detect-Cancer-Early/

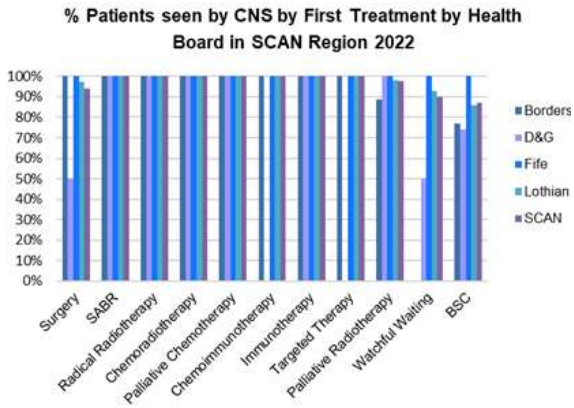
4. Lung Cancer Clinical Nurse Specialist Provision

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 National Lung Cancer Audit Report (NLCA)[8] 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*[9].

Results by health board for the most recent 5 years are shown below with the recommended 90% target. This is shown alongside a breakdown of LCNS workload by first treatment *only* in the SCAN region and is shown by health board for patients diagnosed in 2022.



	Borders	D&G	Fife	Lothian	SCAN
2018	93.0%	79.5%	97.1%	84.8%	87.7%
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%
NLCA Target	90%	90%	90%	90%	90%



In 2022 (and 2021) the proportion of patients seen by a LCNS was slightly reduced in 3 of the 4 health boards in the SCAN region. It is, however, encouraging that patients receiving first line active treatment in oncology are well supported by LCNS across all SCAN health boards. While provision fluctuates for patients who have surgery it should be acknowledged that these patients will additionally be supported by cardiothoracic nurse specialists throughout their surgical pathway. Surgical nursing support data, however, is not currently collected here. Of the 28 patients who received adjuvant oncology treatment post-surgery, all were supported by an LCNS.

To better understand the variance in patients receiving BSC (best supportive care) and seen by LCNS it is worth reiterating treatment types and proportions of patients: curative (26%), palliative (25%), other [deceased/declined treatment] (5%), and BSC (43%). BSC currently make up the highest proportion of first treatment type in SCAN, and similarly in the West of Scotland Cancer Network (WOSCAN) where the BSC ratio is just over 45%. Direct comparisons are not available with Northern Cancer Alliance (NCA) nor with the NLCA report (England & Wales). The high number of patients in the BSC category and the limited resources available are believed to impact on levels of contact.

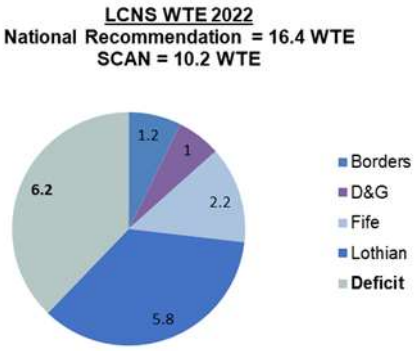
In Scotland, it has been recognised that workforce shortfalls make it very challenging for LCNS staff to meet the demands of a busy service, more especially where there is a deficit in resource. The ratio of LCNS to patients is fundamental to optimal patient care. The United

[8] NLCA: National Lung Cancer Audit (2023): *NLCA State of the Nation Report 2023, Version 3. Results for patients diagnosed in England during 2021 and Wales during 2020-2021.* NLCA State of the Nation Report 2023 Version 3 - National Lung Cancer Audit

[9] NICE (2019, updated 2023): *Lung Cancer: Diagnosis and Management [NG 122]* Lung cancer: diagnosis and management (nice.org.uk)

Kingdom Lung Cancer Coalition (UKLCC) *Scottish Pathways Matter*[10] 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".*

The UKLCC recommendation equates to an ideal of 16.4 WTE for SCAN based on the 2022 cohort (1313 patients).
LCNS provision in SCAN in 2022 equates to only 10.2 WTE, which is equivalent to one nurse for every ***129*** new patients, which falls below the recommended quota of 80 new patients and demonstrates a **deficit** of **6.2** WTE nurses in SCAN.



We should also recognise 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 who instead have ongoing supportive care.

[10] UKLCC (2023): *Scottish Pathways Matter.* Scottish Pathways Matter | UKLCC

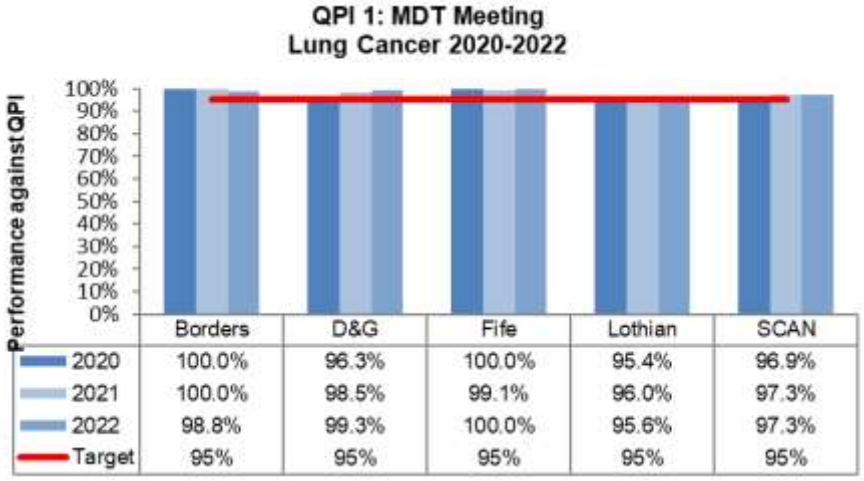
Quality Performance Indicators
Diagnosis and Staging Investigations

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
2022 cohort	80	146	309	778	1313
Ineligible for this QPI*	0	0	0	0	0
Numerator	79	145	309	744	1277
Not recorded for numerator	0	0	0	0	0
Denominator	80	146	309	778	1313
Not recorded for denominator	0	0	0	0	0
Not recorded for exclusions	0	0	0	0	0
% Performance	**98.8%**	**99.3%**	**100.0%**	**95.6%**	**97.3%**

* 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 *all* patients meet the denominator criteria and no exclusions exist.



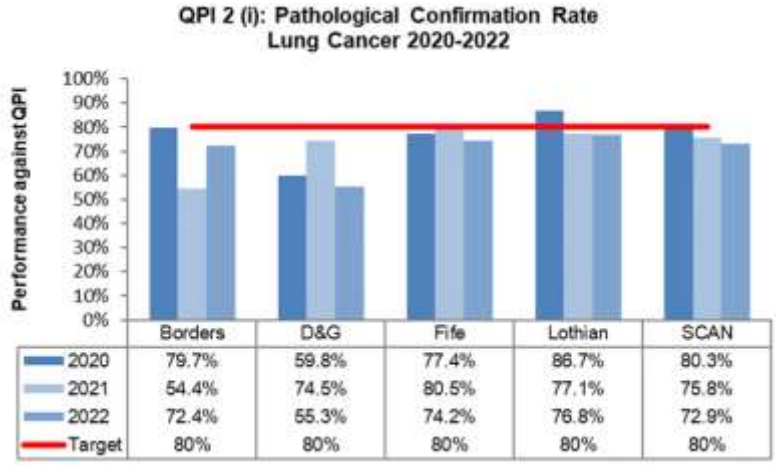
Comment
The QPI was passed by all health boards in the SCAN region in 2022 and no action is required.

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.

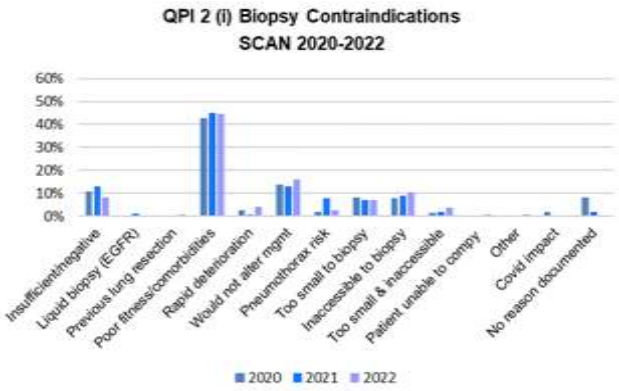
Target 80%	Borders	D&G	Fife	Lothian	SCAN
2022 cohort	80	146	309	778	1313
Ineligible for this QPI (exclusions only)	22	23	123	273	441
Numerator	42	68	138	388	636
Not recorded for numerator	0	0	0	0	0
Denominator	58	123	186	505	872
Not recorded for denominator	0	0	0	0	0
Not recorded for exclusions (PS not recorded)	0	58	5	34	97
% Performance	**72.4%**	**55.3%**	**74.2%**	**76.8%**	**72.9%**



Comment

The target was not met in 2022 with shortfalls of 7.6% (16 cases) Borders; 24.7% (55 cases) Dumfries; 5.8% (48 cases) Fife; and 3.2% (117 cases) Lothian. In SCAN there were a total of 236 outliers (without pathology) accounting for 27.1% of eligible patients, which compares to 23.1% in 2021 and 23.8% in 2020. Potential reasons for a lack of pathology for these outliers have been individually reviewed and listed below:

Outliers 2022	Borders	D&G	Fife	Lothian
ATTEMPTED/OTHER PATHOLOGY				
Insufficient/Negative	-	6	4	9
Liquid biopsy (blood test EGFR)*	-	-	-	1
Previous lung resection	-	-	2	-
PATIENT FITNESS				
Poor fitness/comorbidity	12	22	14	57
Rapid deterioration	1	5		4
Would not alter management		16	12	10
TECHNICAL REASONS				
Pneumothorax risk	-	-	-	6
Too small	-	-	10	7
Inaccessible	-	5	3	17
Too small & inaccessible	2	-	2	5
Pt unable to comply with instructions	-	-	1	1
Other	1	1	-	-
TOTALS	16	55	48	117



* Liquid Biopsy: Blood samples are useful for molecular testing (EGFR status). Although this is not current QPI audit criterion to determine cancer morphology, it is anticipated that these biopsies will be used to confirm pathological diagnoses in due course.

The denominator for this QPI also contains a number of 'unknowns', especially in the Dumfries cohort. These are cases where performance status has not been documented at an MDM, and these are shown as "not recorded for exclusions" in the above table. These cases cannot otherwise be *definitively* identified as an inclusion or an exclusion. QPI reporting guidance states that these 'unknowns' have to be *included in the denominator (but not numerator, even if they had pathology taken, or should have been an exclusion) 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 be inappropriately putting these patients as having not met this QPI standard (i.e. in the denominator category) instead of into the exclusions group i.e. they may be too frail (PS 3 or 4) for a biopsy or into the numerator (they had pathology).

In 2022 there were 97 cases of "not recorded for exclusions", equivalent to just over 11% of the denominator. Within this group there were 26 patients who did have histological diagnosis. Of these, there were 21 who were additionally discussed by MDT. Of the 21 discussed, just over half received active cancer treatment: 7 had surgery; 1 had SABR and 4 received systemic anti-cancer treatment. To be eligible for these treatments these patients would be expected to have PS 0-2 and would therefore be expected to be included and have passed QPI 2 (i). Of those (with histology) who were not discussed by MDT (5 patients) 2 had surgical resection, 1 declined treatment and the remaining 2 received BSC. If these 26 patients, with histology, but no PS recorded, were included in the numerator the QPI rate for SCAN would be 75.9%.

Of the remaining patients i.e. with no pathology (71 patients) the majority received BSC, 52% of which were stage IV. The majority of these patients presented via A&E and were admitted via MoE, GenMed et cetera. It is likely these patients were of poor PS (3 or 4) but it is not documented and therefore these 'unknowns' have to remain in the denominator. Had these patients been documented as PS 3 or 4 they would have been excluded from the analysis and the QPI 2 performance of health boards would potentially have been recorded higher.

Results are fairly comparable with NHS England's rate of pathological confirmation for patients with PS 0-2 demonstrating rates in SCAN of 77% in 2020 and 83% in 2021 but further improvement is required.

Action: Performance Status to be documented at MDT meetings to allow patients to be accurately recorded as exclusions for pathology or for inclusion in the numerator (i.e. pathology and PS both obtained).

Cases referred to MDT meetings are all fully discussed so that all approaches are considered and all proper processes take their course which includes all investigative procedures including PET CT which is an important step for patients being considered for curative treatment. A previous local study by Bain et al[11] recommended the use of Herder Score which is based on PET, size, characteristics of the tumour and smoking status. Herder looks at the probability of cancer as an alternative non-invasive option in confirming the likelihood of malignancy. Growth over serial CT scans in conjunction with Herder can also accurately indicate malignancy.A Herder of 90% and above is a good indication that radical lung cancer treatment is appropriate.

[11] Bain L, Hainey S, Henderson W, Reid PA (Respiratory, Western General Hospital, Edinburgh), 2020: *Lung Cancer Patients Without Tissue Diagnosis in NHS Lothian 2016 – 2018*. The full Audit can be found in the 2020 Lung Cancer QPI Report which is available on the SCAN website (www.scan.scot.nhs.uk)

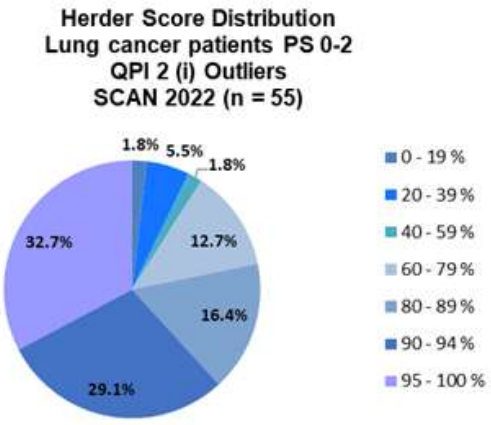
An additional audit was carried out at St John's Hospital in Livingston[12] (based on the 2021 cohort) to assess whether the Lung Cancer MDT at St John's Hospital was adherent to the British Thoracic guideline regarding the assessment of patients with pulmonary nodules, with specific interest in the appropriate use of the Herder model:

> Of the patients with pulmonary nodules, 58% had the appropriate use and documentation of the Herder model correctly documented in the MDT clinic letter. All of these patients received appropriate treatment as per the national guideline based on their score. Of those with no Herder documentation the majority received best supportive care due to frailty or comorbidities. The St John's audit recommendation was for the MDT to record Herder score for patients, without pathological confirmation, who have solitary nodules under 30mm.

Action: It is recommended that Herder score continues to be documented by the MDT for patients with PET CT nodules >8mm and <30mm. Not only does this confirm the likelihood of malignancy but also provides a model to assess the appropriateness of radical treatment (surgical resection and radical radiotherapy) for patients without histological diagnoses.

Herder results from MDT meetings for patients diagnosed in 2022 without histological diagnosis are as follows:

	Borders	D&G	Fife	Lothian	SCAN
Herder recorded	3	3	17	32	55
Not recorded	9	3	1	9	22
Over 30mm: n/a	-	36	28	28	92
No PET: n/a	4	13	2	48	67



Herder reporting at MDT meetings in 2022 is promising. While this QPI considers *all* patients diagnosed with lung cancer, and not only those going on to receive radical treatment, it is encouraging that over 60% of all outliers, in QPI 2 (i), have a reported Herder score of 90% and above. Patients with high Herder but no pathology can therefore be referred for radical treatment in cases where pathology isn't available or appropriate. See also results for QPI 15 (i) and (ii) which considers histology rates for patients who have surgical resection or radical radiotherapy.

Sometimes it is not appropriate to pursue pathology in lung cancer patients. Previous detailed reviews of SCAN data[13] have shown there exist 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.

[12] Turner, M, Plant, T (Respiratory, St John's Hospital, Livingston) 2023: *Preliminary Assessment of the Herder Model for the Investigation and Treatment of Patients with Pulmonary Nodules at St John's Hospital Livingston 2021*. Further details can be found in the 2021 Lung Cancer QPI Report, available on the SCAN website.

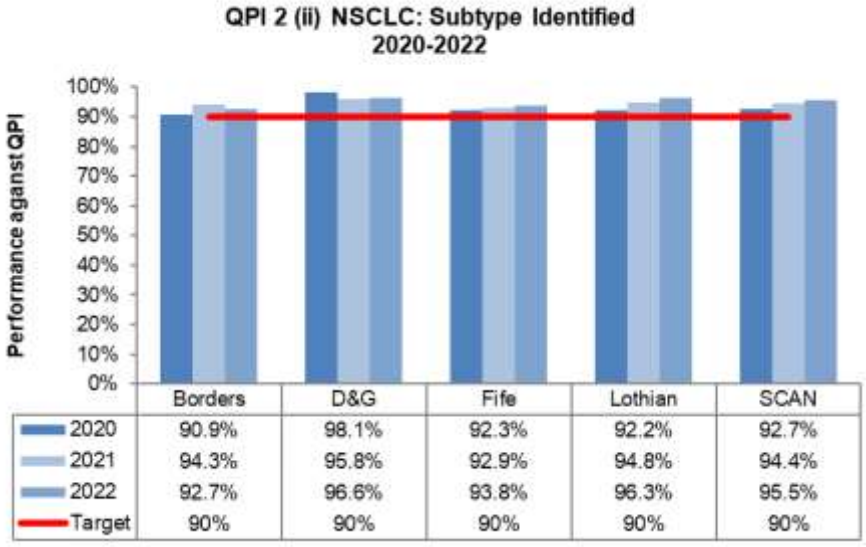
[13] Bain L et al, 2020: *Lung Cancer Patients Without Tissue Diagnosis in NHS Lothian 2016 – 2018*. (2020 Lung Cancer QPI Report) (www.scan.scot.nhs.uk).

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[14]
Denominator = All patients with a pathological diagnosis of NSCLC (no exclusions).

Target 90%	Borders	D&G	Fife	Lothian	SCAN
2022 cohort	80	146	309	778	1313
Ineligible for this QPI*	39	88	180	401	708
Numerator	38	56	121	363	578
Not recorded for numerator	0	0	0	0	0
Denominator	41	58	129	377	605
Not recorded for denominator	0	0	0	0	0
Not recorded for exclusions	0	0	0	0	0
% Performance	**92.7%**	**96.6%**	**93.8%**	**96.3%**	**95.5%**

* 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 categories: patients with a diagnosis of SCLC, carcinoid or 'other' malignancies; and those with an imaging diagnosis. In this instance no exclusions exist.



Comment

The QPI was passed by all health boards in the SCAN region in 2022.

This QPI has been consistently met prior to and since FR2 changes were implemented, i.e. before and after the inclusion of code 31 in the numerator. Improved immunochemistry methods in pathological diagnostics result in fewer "not otherwise specified" (NOS) rates and sub-typing, which is required for oncogenic mutation profiling or PDL1 testing to enable patient-targeted treatments, is consistently surpassing targets, and achieving high success rates.

Action: Re-assess the relevance of this QPI and discuss the option of archiving at the next formal review.

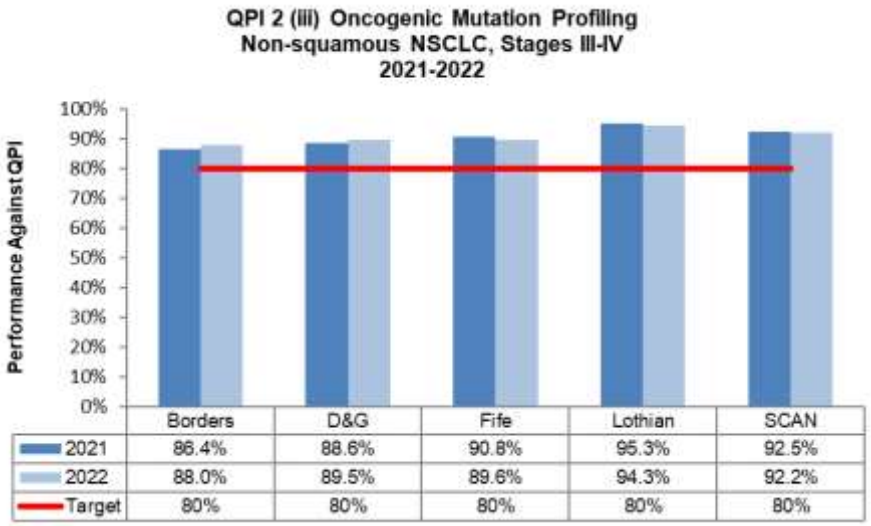
[14] NSCLC sub types = Squamous, Adenocarcinoma, Other Specific NSCLC and Combination of non-small cell components, i.e. does not include NSCLC (NOS), as specified in *Lung Cancer Measurability of Quality Performance Indicators, Version 4.0*: ISD Scotland: January 2020.

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
2022 cohort	80	146	309	778	1313
Ineligible for this QPI*	55	120	239	615	1029
Numerator	22	17	60	149	248
Not recorded for numerator	0	0	0	0	0
Denominator	25	19	67	158	269
Not recorded for denominator	0	7	3	5	15
Not recorded for exclusions**	0	2	0	3	5
% Performance	**88.0%**	**89.5%**	**89.6%**	**94.3%**	**92.2%**

* 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 categories: patients with a diagnosis of SCLC, squamous, carcinoid or 'other' malignancies; patients with an imaging diagnosis; and stage I-II non-squamous NSCLC. Exclusions are patients reported as PS4.
** Not recorded for exclusions are those patients where PS was not documented.



Comment

The QPI was passed by all health boards in the SCAN region in 2022.

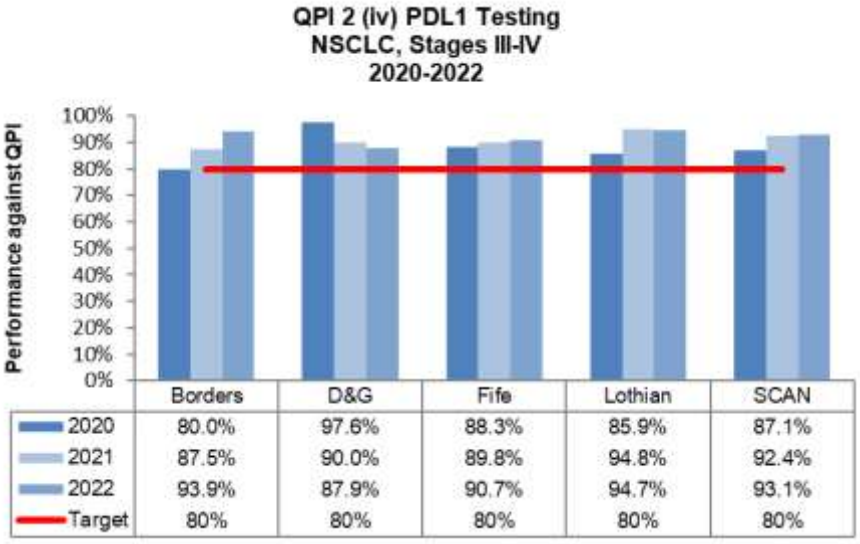
This QPI has been consistently met pre and post formal reviews.

Action: Re-assess the relevance of this QPI and discuss the option of archiving at the next formal review.

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
2022 cohort	80	146	309	778	1313
Ineligible for this QPI	47	104	208	547	906
Numerator	31	29	88	214	362
Not recorded for numerator	0	0	0	0	0
Denominator	33	33	97	226	389
Not recorded for denominator	0	9	4	5	18
Not recorded for exclusions	0	6	0	4	10
% Performance	**93.9%**	**87.9%**	**90.7%**	**94.7%**	**93.1%**



Comment
The QPI was passed by all health boards in the SCAN region in 2022.

This QPI has been consistently met pre and post formal reviews.

Action: Re-assess the relevance of this QPI and discuss the option of archiving at the next formal review.

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).

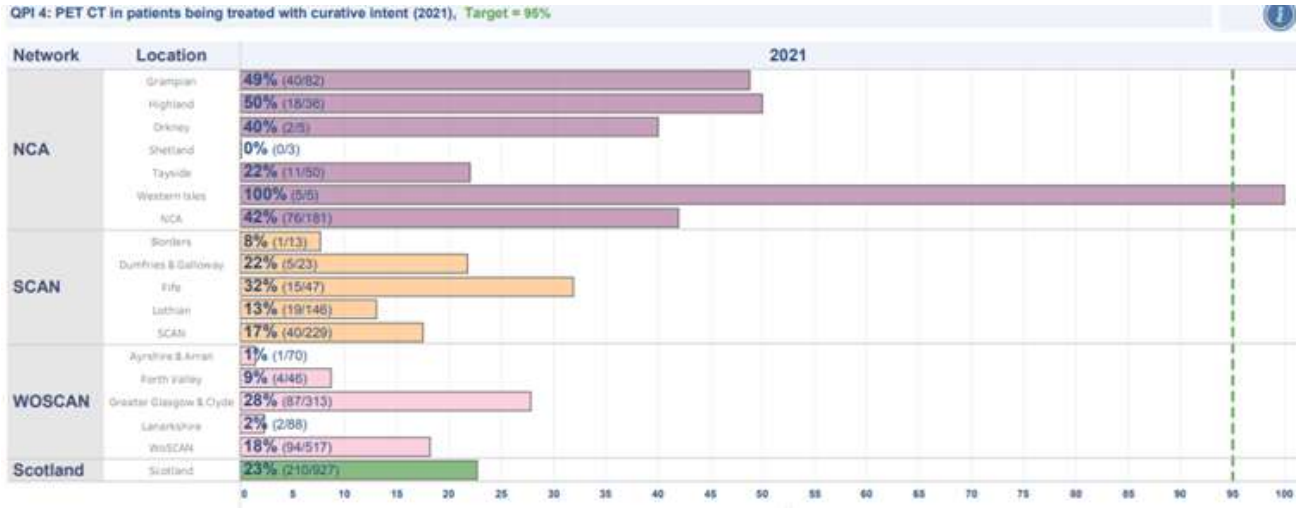
Target 95%	Borders	D&G	Fife	Lothian	SCAN
2022 cohort	80	146	309	778	1313
Ineligible for this QPI	70	119	262	617	1068
Numerator	0	0	7	21	28
Not recorded for numerator	0	2	0	0	0
Denominator	10	27	47	161	245
Not recorded for denominator	0	0	0	0	0
Not recorded for exclusions	0	0	0	0	0
% Performance	**0.0%**	**0.0%**	**14.9%**	**13.0%**	**11.4%**

Comment

This QPI was not met by any of the health boards in the SCAN region. This is the second year of reporting PET CT using a designated time scale, i.e. within 10 'actual' days.

	Borders	**D&G**	**Fife**	**Lothian**
Performance (%)	0.0%	0.0%	14.9%	13.0%
Shortfall (%)	95.0%	95.0%	80.1%	82.0%
Nº of Outliers	10	25	40	140
Denominator	10	27	47	161

Shortfalls appear very disappointing and action to remedy shortfalls in resources is urgently required. Below are performance outcomes across Scotland in 2021 which show similar results to the current year, with some exceptions in the North of Scotland. Better results in the North are likely due to 'one-stop clinic/procedures' which have been implemented so that patients in remote locations fly to attend 'regional' clinics and have investigative procedures all undertaken on the same day before they return home.



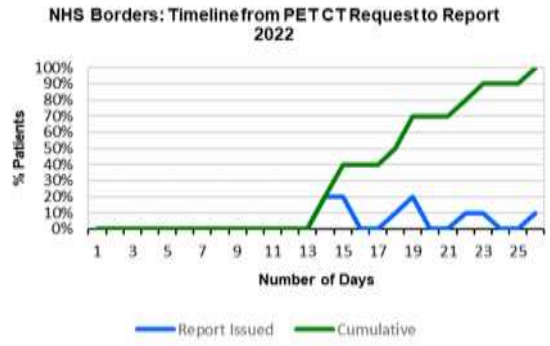
An action has been agreed regionally to address the overwhelming lack of capacity in Scotland. In addition to external factors such as the often poor availability of radio isotopes or tracers, most commonly FDG (F-fluorodeoxyglucose), the SCAN region (and similarly across Scotland) is impacted jointly by workforce resource limitations and by competing pressures on the PET service from specialties other than lung cancer and, is additionally required to assess patients for many

second-line oncology treatment types for lung cancer progressive disease. It is acknowledged 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.

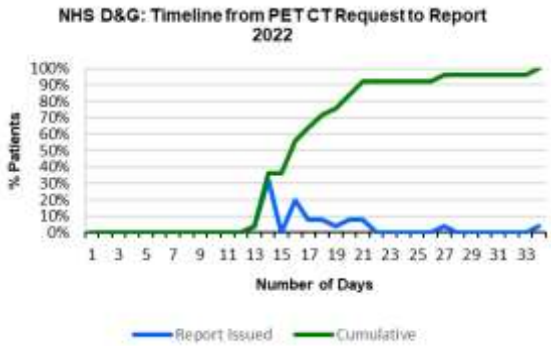
Action: A pilot is underway at WGH with scheduled PET CT scans coinciding with respiratory clinics. A CT chest scan is performed the same day as clinic and patients with stage II/III, where mediastinal staging will affect treatment choices, to receive PET CT scan the following day (2 prebooked scan slots have been made available); followed by EBUS early the following week (after dual reporting of PET). It is anticipated that the pilot will heighten awareness regarding the concerns which exist around PET provision in Scotland and more particularly in the comparison between WGH and those other hospitals not participating in the pilot.

Although results in all health boards are disappointing it should be noted that the number of days taken for this QPI is not linear and that a rapid rise is apparent between 2 and 3 weeks such that most patients have a PET result within 3 weeks of request. The median ranges from 14 – 19 days across SCAN HBs in 2022.

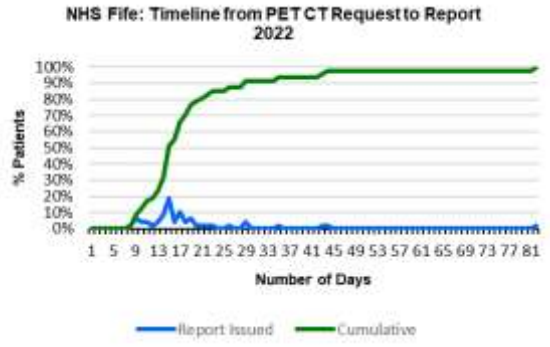
Number of Days from PET Request to Report by NHS Board



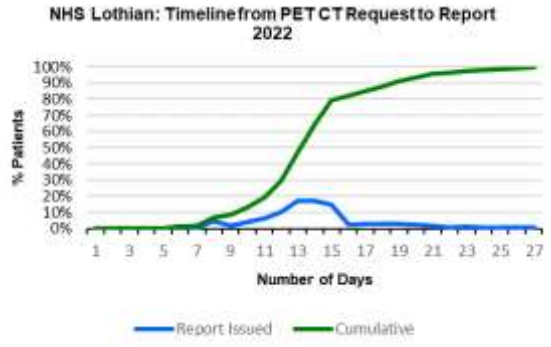
Median: 19 Range: 14-26 days



Median: 16 Range: 13-34 days



Median: 15 Range: 8-82 days

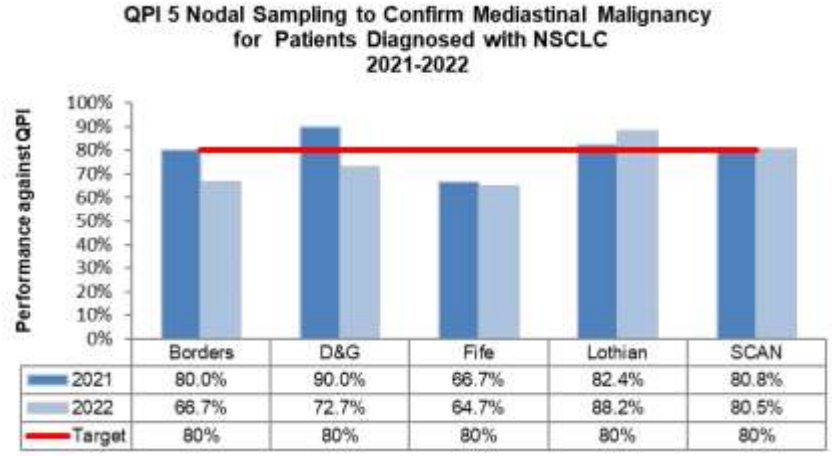


Median: 14 Range: 6-27 days

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[15] nodes (N3), that have invasive nodal staging (assessment /sampling) performed[16] 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[17] disease or who decline investigation.

Target 80%	Borders	D&G	Fife	Lothian	SCAN
2022 cohort	80	146	309	778	1313
Ineligible for this QPI	77	135	292	727	1231
Numerator	2	8	11	45	66
Not recorded for numerator	0	0	0	0	0
Denominator	3	11	17	51	82
Not recorded for denominator	0	0	0	0	0
Not recorded for exclusions	0	0	0	0	0
% Performance	**66.7%**	**72.7%**	**64.7%**	**88.2%**	**80.5%**



Comment

Full and complete staging is an important requirement used to inform oncological treatment intent decisions, i.e. radical versus palliative. The target was not met in Borders, D&G or Fife with respective shortfalls of 13.3% (1 case); 7.3% (3 cases); 15.3% (6 cases). However, the impact of small numbers on results should also be acknowledged.

Reasons Nodal Sampling was not undertaken	Borders	D&G	Fife
EBUS would not alter management	-	2	-
N1 node status would not alter radical radiotherapy field	-	1	-
Bronchoscopy or EBUS of mass only	1	-	2
T4 disease	-	-	2
No reason documented	-	-	2
TOTALS	1	3	6

Action: NHS Borders, D&G and Fife are to audit local service to consider why nodes are not fully sampled and staged and, to consider the implications on treatment intent and subsequent options that will be available to the patient.

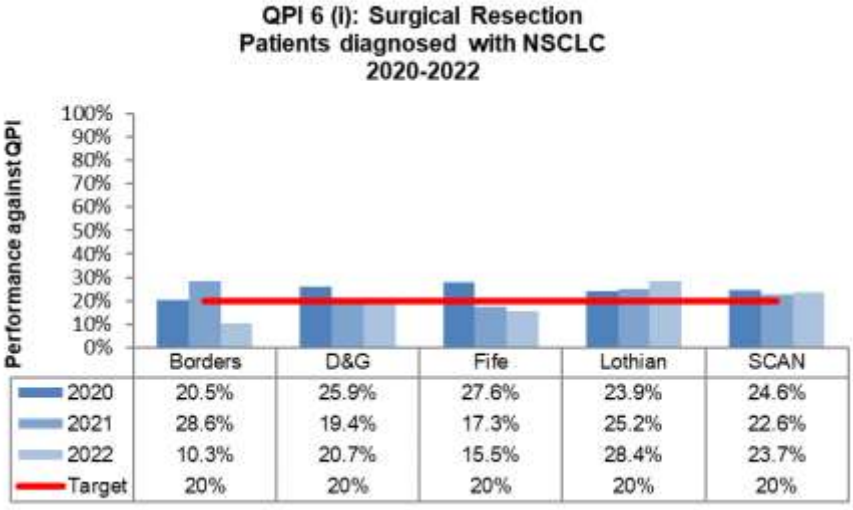
[15] SCF: Supraclavicular Fossa
[16] Methods of sampling include Neck US guided or direct biopsy (core or FNA), EBUS, EUS-B, EUS, mediastinoscopy or VATS (Video-Assisted Thoracoscopic Surgery).
[17] Stage IV: M1, M1a, M1b, or M1c disease.

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
2022 cohort	80	146	309	778	1313
Ineligible for this QPI	41	88	180	401	710
Numerator	4	12	20	107	143
Not recorded for numerator	0	0	0	0	0
Denominator	39	58	129	377	603
Not recorded for denominator	0	0	0	0	0
Not recorded for exclusions	0	0	0	0	0
% Performance	**10.3%**	**20.7%**	**15.5%**	**28.4%**	**23.7%**



Comment
This QPI was passed by NHS D&G and NHS Lothian. The target fell short in NHS Borders with a shortfall of 9.7% (35 cases) and in NHS Fife of 4.5% (109 cases); with surgery not appropriate due mainly to advanced disease, poor fitness and/or comorbid conditions. Nonetheless, a mini audit is to be undertaken by NHS Fife to corroborate results and ensure best practice. It should be noted that QPI 6 (i) encompasses all patients with NSCLC regardless of stage, comorbidities or fitness levels as compared to QPI 6 (ii): NSCLC patients, stage I-II only.

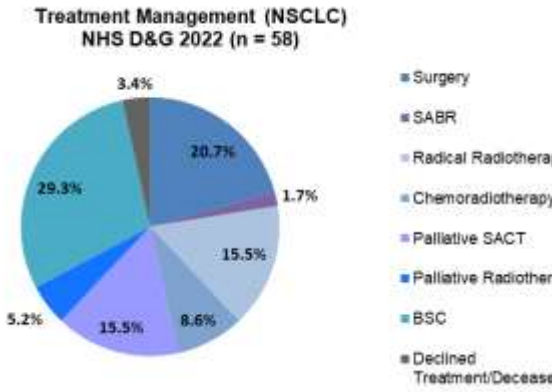
Contraindications to Surgery	**Borders**	**Fife**
Patient choice	1	2
Significant comorbidities	1	9
Comorbidities and frailty	13	-
Advanced disease	17	98
Lesion unsuitable or unsafe for resection	3	-
TOTALS	35	109

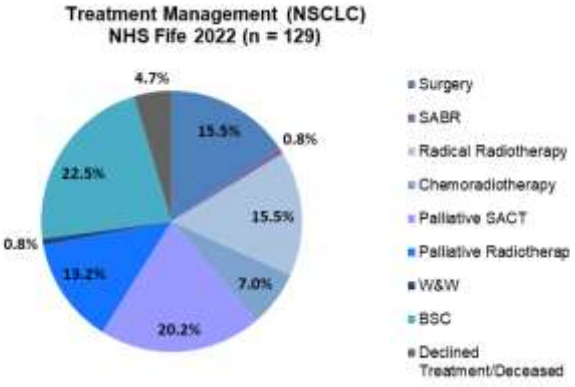
Action: NHS Fife to conduct a mini audit of outliers to corroborate results and confirm best practice.

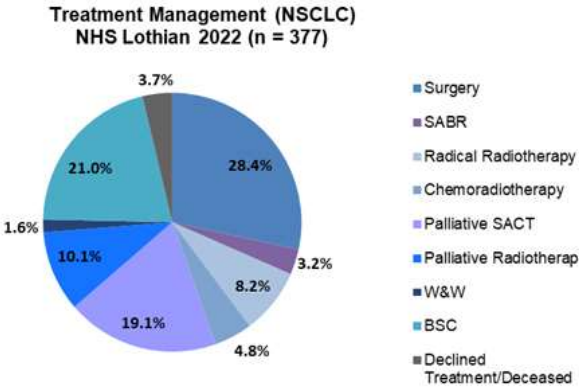
The tolerance level within this target accounts for the fact that not all patients are suitable for surgical resection due to extent of disease, for example, patients with stages IIIA-B do not have a surgical option but are radically treatable with chemoradiotherapy. Other patients with more advanced disease, and/or poor fitness or comorbidities are offered oncology treatment or supportive care options on a patient-by-patient basis.

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 conventional radical radiotherapy or SABR.

Treatment management of NSCLC patients identified using the criteria outlined in QPI 6 (i) are shown below for all 4 health boards in SCAN:



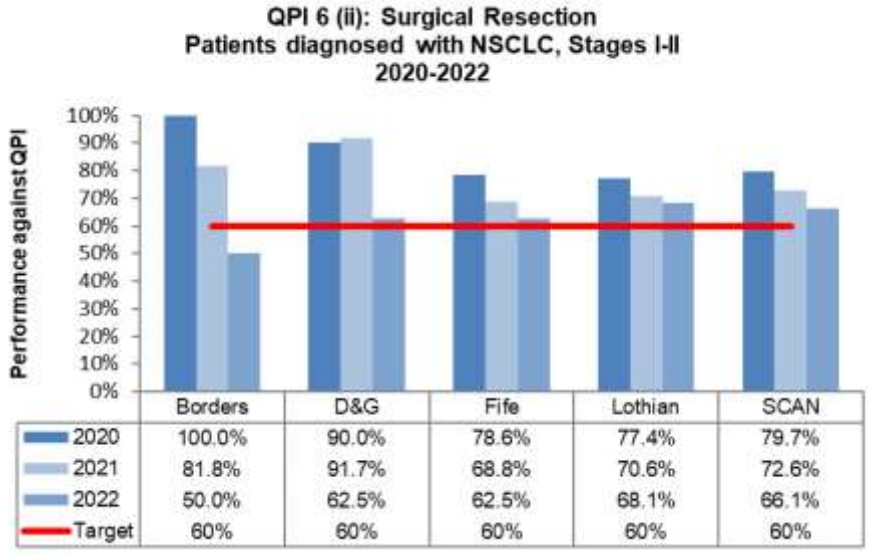




6 (ii) NSCLC, Stage I-II and Surgical Resection **Target = 60%**

Numerator = Number of patients with NSCLC, Stage I-II[18] 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
2022 cohort	80	146	309	778	1313
Ineligible for this QPI	72	121	283	639	1115
Numerator	4	10	15	92	121
Not recorded for numerator	0	0	0	0	0
Denominator	8	16	24	135	183
Not recorded for denominator	0	9	2	4	15
Not recorded for exclusions	0	0	0	0	0
% Performance	**50.0%**	**62.5%**	**62.5%**	**68.1%**	**66.1%**



Comment

The target was missed in NHS Borders with a shortfall of 10% (4 cases). However, the consequences of small numbers should be noted and the condition which arises where 1 case can make the difference between achieving or not achieving required targets. Indeed, 1 patient declined surgery in favour of less invasive SABR and had this patient gone ahead with surgery the performance for NHS Borders would raise to 62.5% and the target would have been achieved. The remaining 3 outliers were not suitable for surgical resection due to comorbidities and/or frailty. All represent valid clinical reasons and no action is required.

[18] 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%

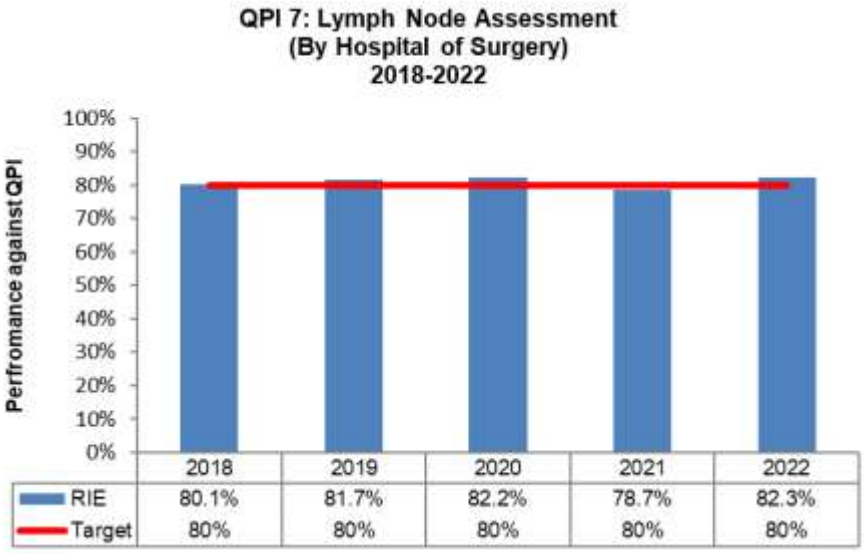
QPI 7 is analysed by *Hospital of Surgery* as compared to most other QPIs which are analysed by Board of Diagnosis. Surgical outcomes are the responsibility of the hospital where the surgery was undertaken. Responsibility does not lie with the Health Board who referred patients (often outwith their HB 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%	2018	2019	2020	2021	**2022**
Numerator	121	107	111	107	107
Not recorded for numerator	14	0	0	2	0
Denominator*	151	131	135	136	130
Not recorded for denominator	0	0	0	0	0
Not recorded for exclusions	0	0	0	0	0
% Performance	**80.1%**	**81.7%**	**82.2%**	**78.7%**	**82.3%**

* The denominator includes patients who were diagnosed in NHS Tayside and who had surgery at RIE: 43 (2018); 24 (2019); 15 (2020); and 20 (2021); and 13 (2022). 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

The target has been consistently met in 4 of the 5 years reported. It was narrowly missed in 2021 with a shortfall of 1.3%.

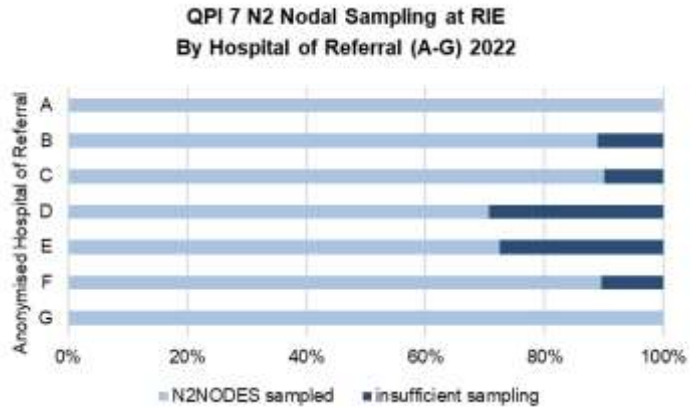
An audit was carried out by the cardiothoracic team at the Royal Infirmary of Edinburgh in 2021 and all outliers were reviewed. The focus was on outcomes associated with actual nodal harvest as compared to those established by microscopic examination; the latter being the measurement used for this QPI. Interpretation of nodal outcome was found to be complex:

- It was acknowledged that challenges existed at surgical level to determine ‘by eye’ if sufficient sampling had been undertaken to meet the QPI criteria.
- Moreover, at pathological level, it is not possible to distinguish between “sample not sent” and “site sampled but no nodal tissue or only fatty tissue” obtained.

- Ultimately, it is the number of nodes microscopically identified in the piece of tissue submitted irrespective of the number of metastatic deposits sampled.

Good surgical practice was evidenced in the audit. If no lymph nodes are seen in a particular station then sampling does not occur whereas consistent sampling is undertaken for blocks or areas of multiple nodes, with a view to accomplishing comprehensive sampling. Resection of lymph nodes is therefore undertaken in good faith although sometimes without the desired outcome. It remains challenging given the possibility that nodes might not be identified *microscopically* in the tissue blocks submitted.

Patients are referred from 7 hospitals to the cardiothoracic team at the Royal Infirmary of Edinburgh and outcomes of nodal sampling by (anonymised) hospital of referral are shown below for patients diagnosed in 2022.



Unexplained interhospital differences were evident and it was acknowledged that while the challenges faced by surgeons are complex these differences require further investigation. An analysis of interhospital differences over the last 3 years has been recommended and results are awaited.

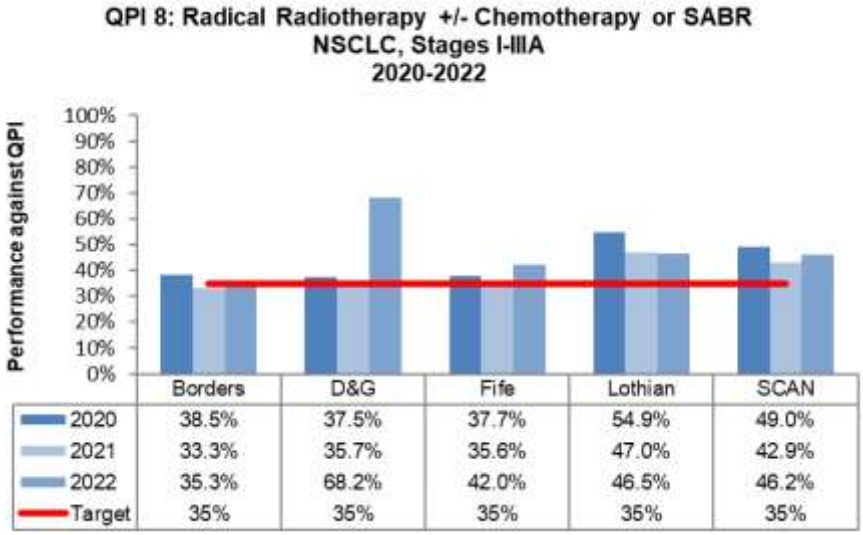
Action: An audit of interhospital differences in nodal sampling over the last 3 years is to be undertaken and will be reported in due course.

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[19] +/- 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
2022 cohort	80	146	309	778	1313
Ineligible for this QPI	63	97	218	546	924
Numerator	6	15	37	94	152
Not recorded for numerator	0	0	0	0	0
Denominator	17	22	88	202	329
Not recorded for denominator	0	27	3	30	60
Not recorded for exclusions	0	0	0	0	0
% Performance	**35.3%**	**68.2%**	**42.0%**	**46.5%**	**46.2%**

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



Comment

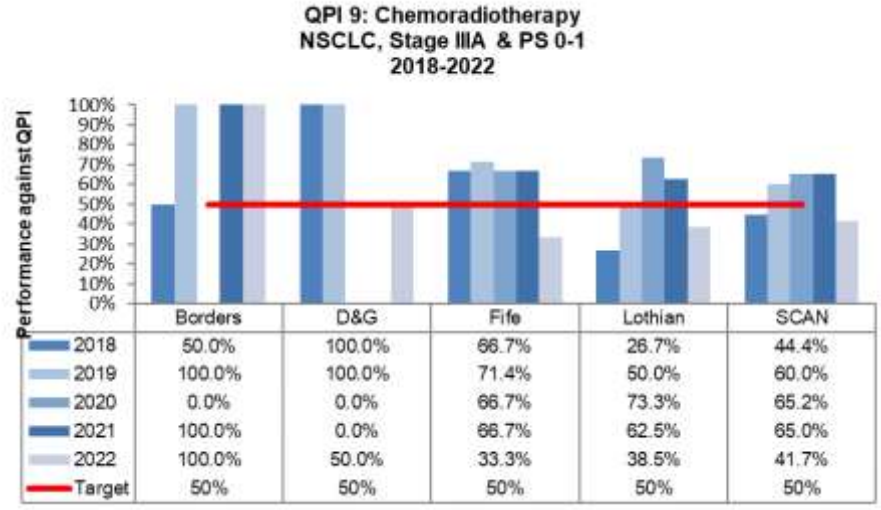
The QPI was passed by all health boards in the SCAN region in 2022 and no action is required.

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

QPI 9 Chemoradiotherapy: Locally Advanced NSCLC Target = 50%

Numerator = Number of patients with NSCLC, Stage IIIA[20] and PS 0-1, not undergoing surgery and who receive Chemoradiotherapy[21].
Denominator = All patients with NSCLC, Stage IIIA and PS 0-1 not undergoing surgery who receive radical radiotherapy[22].
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
2022 cohort	80	146	309	778	1313
Ineligible for this QPI	79	141	303	765	1288
Numerator	1	2	2	5	10
Not recorded for numerator	0	0	0	0	0
Denominator	1	4	6	13	24
Not recorded for denominator	0	1	0	0	1
Not recorded for exclusions	0	0	0	0	0
% Performance	**100.0%**	**50.0%**	**33.3%**	**38.5%**	**41.7%**



	Borders	D&G	Fife	Lothian	SCAN
2018	50.0%	100.0%	66.7%	26.7%	44.4%
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%
Target	50%	50%	50%	50%	50%

NOTE: 0% do 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

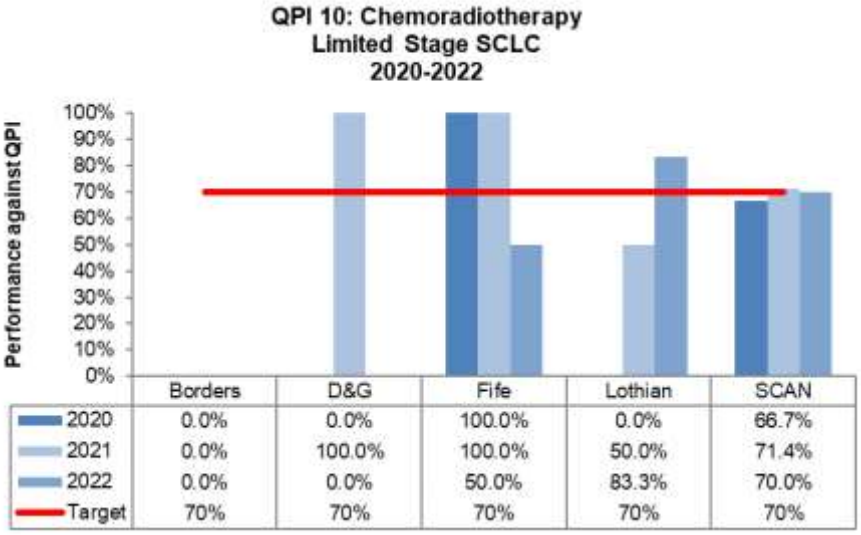
The QPI was missed in 2022 by Fife with a shortfall of 16.7% (4 cases) and by Lothian where the shortfall was 11.5% (8 cases). The impact of small numbers should be noted and that variation may be due to chance. Valid clinical reasons were provided: poor fitness and/or comorbidities precluded the chemotherapy component and all 12 patients went on to receive radical radiotherapy alone.

[20] Stage IIIA NSCLC includes: T1a-c N2 M0; T1b N2; T2a-b N2M0; T3 N1 M0; T4 N0-1 M0.
[21] NSCLC Chemoradiotherapy: radiotherapy ≥ 54Gy and concurrent or sequential chemotherapy.
[22] 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[23] and PS 0-1 who receive chemoradiotherapy[24].
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
2022 cohort	80	146	309	778	1313
Ineligible for this QPI	80	145	304	772	1301
Numerator	0	0	2	5	7
Not recorded for numerator	0	0	0	0	0
Denominator	0	0	4	6	10
Not recorded for denominator	0	1	1	0	2
Not recorded for exclusions	0	0	0	0	0
% Performance	**n/a**	**n/a**	**50.0%**	**83.3%**	**70.0%**



NOTE: 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 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 showing no representation. In 2022, the target was not met in NHS Fife with a shortfall of 20% (2 cases). These 2 patients had vascular disease which precluded platinum-based chemotherapy. This represents a valid clinical contraindication, and no action is therefore required. 1 patient went on to have radical radiotherapy alone while the other received supportive care.

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

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

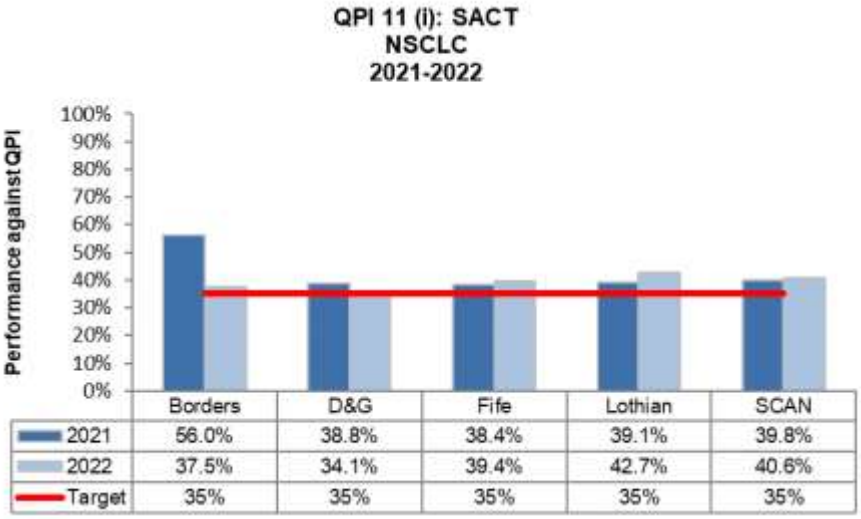
At Formal Review Cycle 2, the QPI 11 suite was revised to accommodate changes in oncology treatment management for patients diagnosed with NSCLC who receive SACT, as well as to provide more comprehensive reporting.

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
2022 cohort	80	146	309	778	1313
Ineligible for this QPI	48	102	210	539	899
Numerator	12	15	39	102	168
Not recorded for numerator	0	0	0	0	0
Denominator	32	44	99	239	414
Not recorded for denominator	0	0	0	0	0
Not recorded for exclusions	0	0	0	0	0
% Performance	**37.5%**	**34.1%**	**39.4%**	**42.7%**	**40.6%**



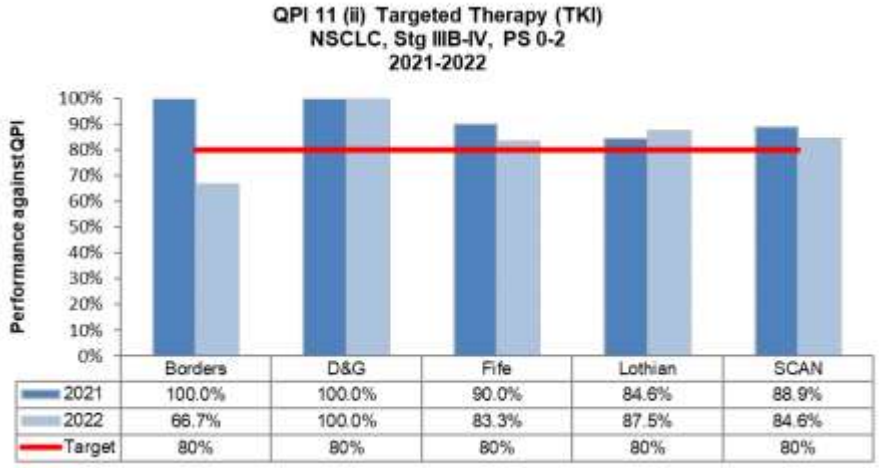
Comment

The QPI was missed in 2022 by NHS D&G with a shortfall of 0.9% (29 cases). SACT was not possible for these patients due to poor fitness from frailty and/or comorbidities. Of these, 11 patients went on to receive radiotherapy while the remaining 18, who were not suitable for active treatment, were provided with ongoing supportive care. Given the valid clinical reasons, 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[25]
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.

Target 80%	Borders	D&G	Fife	Lothian	SCAN
2022 cohort	80	146	309	778	1313
Ineligible for this QPI	77	145	303	762	1287
Numerator	2	1	5	14	22
Not recorded for numerator	0	0	0	0	0
Denominator	3	1	6	16	26
Not recorded for denominator	0	0	0	0	0
Not recorded for exclusions	0	0	0	0	0
% Performance	**66.7%**	**100.0%**	**83.3%**	**87.5%**	**84.6%**



Comment

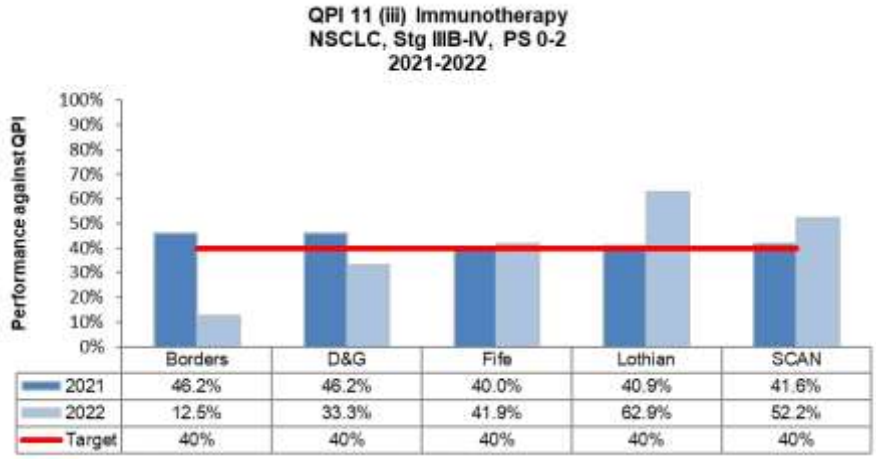
In 2022 this QPI was passed by all health boards in the SCAN region except NHS Borders which showed a shortfall of 13.3% (1 case). This patient had comorbidities which precluded TKI treatment. No action is required.

[25] 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 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
2022 cohort	80	146	309	778	1313
Ineligible for this QPI	72	134	278	705	1189
Numerator	1	2	13	44	60
Not recorded for numerator	0	0	0	0	0
Denominator	8	6	31	70	115
Not recorded for denominator	0	6	0	3	9
Not recorded for exclusions	0	0	0	0	0
% Performance	**12.5%**	**33.3%**	**41.9%**	**62.9%**	**52.2%**



Comment

In 2022, QPI 11 (iii) was passed by Fife and Lothian but showed shortfalls in Borders of 27.5% (7 cases) and 6.7% (4 cases) in D&G. It should be noted that small numbers have impacted on results. All 11 outliers were managed appropriately. In Borders all 7 outliers were not fit enough to have immunotherapy while for the 4 patients in D&G, frailty and/or comorbidities precluded immunotherapy. In D&G, 1 patient received palliative radiotherapy, 1 palliative chemotherapy only and the remaining 2 patients were managed as best supportive care. No action is required.

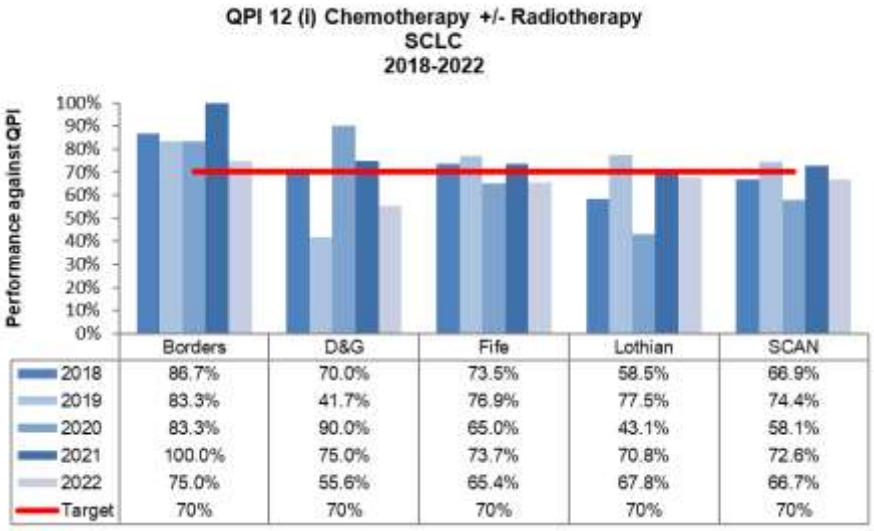
QPI 12 Chemotherapy for Small Cell Lung Cancer

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

Numerator = Number of patients with SCLC who receive chemotherapy[26] ± 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
2022 cohort	80	146	309	778	1313
Ineligible for this QPI	72	137	283	719	1211
Numerator	6	5	17	40	68
Not recorded for numerator	0	0	0	0	0
Denominator	8	9	26	59	102
Not recorded for denominator	0	0	0	0	0
Not recorded for exclusions	0	0	0	0	0
% Performance	**75.0%**	**55.6%**	**65.4%**	**67.8%**	**66.7%**

Comment
This QPI was passed by Borders but showed shortfalls in D&G of 14.4% (4 cases); Fife 4.6% (9 cases); and Lothian narrowly missed by 2.2% (19 cases).



	Borders	D&G	Fife	Lothian	SCAN
2018	86.7%	70.0%	73.5%	58.5%	66.9%
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%
Target	70%	70%	70%	70%	70%

OUTLIERS
Outliers comprise of 2 main categories, with the following outcomes:

		D&G	Fife	Lothian
1. Comorbidities precluded chemotherapy/treatment		**4**	**4**	**8**
Alternative Treatment Given:	Radical radiotherapy	1	1	
	Palliative radiotherapy		1	
	Surgery, no adjuvant SACT			1
	Best Supportive Care	3	2	7

	D&G	Fife	Lothian
2. Poor Performance Status/Frailty		**5**	**11**
Precludes chemotherapy		5	9
Deterioration post MDM			2

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

This QPI continues to be challenging and an action was raised to run local audits to ascertain reasons why patients in the 2022 cohort did not receive chemotherapy +/- radiotherapy. The denominator produces very small cohorts and the potential consequences of skewed or disproportionate outcomes should be acknowledged in any scrutiny of the results.

LOCAL AUDITS

NHS Fife: 9 Outliers:

- Main theme of poor PS with declining status from PS2 to PS3 from first assessment to oncology or result clinic.
- Comorbidities precluded chemotherapy for 4 of the 9 patients, 1 of whom had a high risk of thromboembolic complications.

NHS Lothian: 19 Outliers:

- Most presented to hospital through unscheduled care (A&E or GP referral to medical unit)
- Most presented at PS3 or 4 (all unscheduled care patients)
- Tissue diagnoses mainly through minimally invasive means (pleural fluid or accessible lymph nodes)
- Oncology on site (SJH & WGH) results in inpatient review for SCLC by on-call oncologists although seeing an oncologist as inpatient did not alter overall outcome (caveat: small/skewed population)

RECOMMENDATIONS

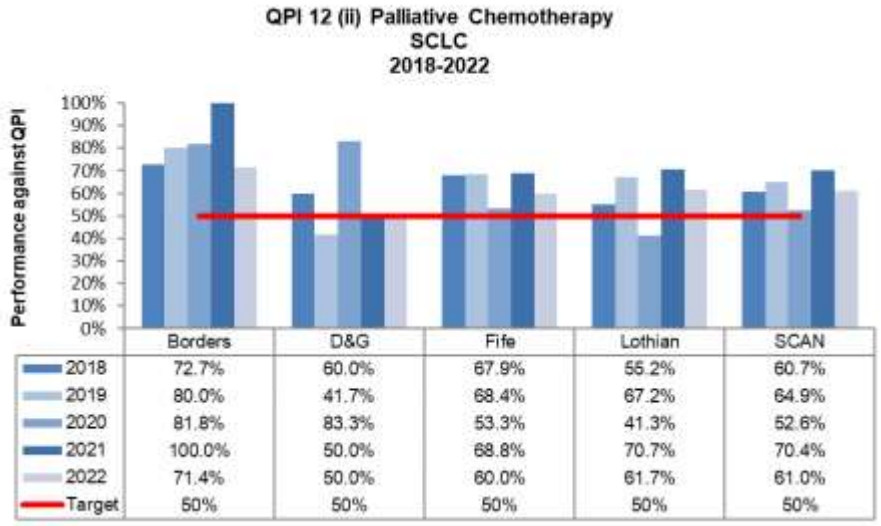
1. All patients must be discussed at MDT, even if clearly for BSC.
2. Investigations must be organised as “urgent” to counteract any potential delays.

Action: Investigations for patients diagnosed with SCLC must be organised as “urgent” to counteract any potential delays.

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
2022 cohort	80	146	309	778	1313
Ineligible for this QPI	73	138	289	731	1231
Numerator	5	4	12	29	50
Not recorded for numerator	0	0	0	0	0
Denominator	7	8	20	47	82
Not recorded for denominator	0	0	0	0	0
Not recorded for exclusions	0	0	0	0	0
% Performance	**71.4%**	**50.0%**	**60.0%**	**61.7%**	**61.0%**



	Borders	D&G	Fife	Lothian	SCAN
2018	72.7%	60.0%	67.9%	55.2%	60.7%
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%
Target	50%	50%	50%	50%	50%

Comment
The QPI was passed by all health boards in the SCAN region in 2022 and no action is required.

QPI 12 (ii) had previously proved to be challenging due to *the rapidity in which this disease [SCLC] causes relentless deterioration in an already frail patient group as opposed to concerns with a protracted pathway*[27]. In response to this, a 'SCLC Alert' was set up in NHS Lothian in October 2020 so that the pathology department would alert oncology clinicians to all new diagnoses of small cell lung cancer, independent of MDM, to enable pre-booking of urgent new patient appointments in oncology for these patients. The success of the 'SCLC Alert' is evidenced in the 2021 and 2022 and it is anticipated that results will continue on this trajectory as this is embedded in clinical practice.

[27] Audit undertaken by Dr Ashley Pheely, *Understanding the pathway for patients diagnosed with small cell lung cancer who did not receive chemotherapy in 2018 in NHS Lothian*. The full Audit is available in the 2020 Lung Cancer QPI Report which is available on the SCAN website.

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.

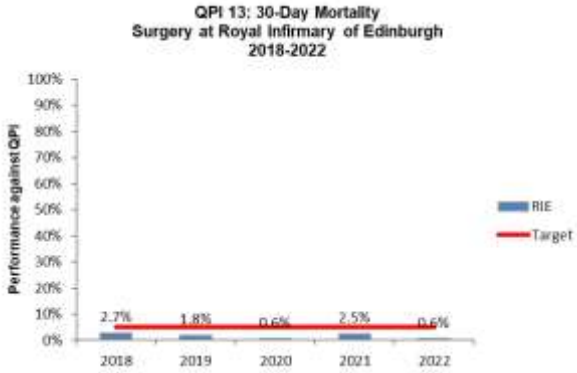
QPI 13 (i) A: Surgery: 30-Day Mortality **Target <5%**

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%	2018	2019	2020	2021	**2022**
Numerator	5	3	1	4	**1**
NR* numerator	0	0	0	0	**0**
Denominator[28]	188	166	172	157	**161**
NR denominator	0	0	0	0	**0**
NR exclusions	0	0	0	0	**0**
% Performance	**2.7%**	**1.8%**	**0.6%**	**2.5%**	**0.6%**

*NR: Not Recorded

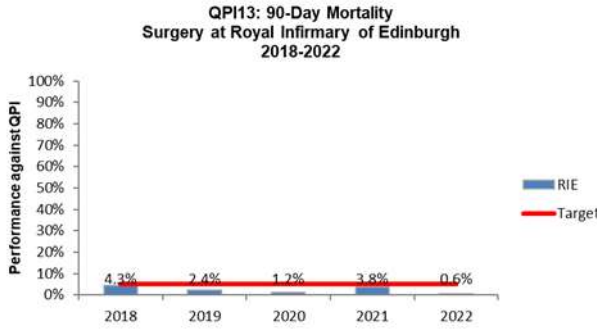


QPI 13 (i) B: Surgery: 90-Day Mortality **Target <5%**

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%	2018	2019	2020	2021	**2022**
Numerator	8	4	2	6	**1**
NR* numerator	0	0	0	0	**0**
Denominator	187	164	172	156[29]	**161**
NR denominator	0	0	0	0	**0**
NR exclusions	0	0	0	0	**0**
% Performance	**4.3%**	**2.4%**	**1.2%**	**3.8%**	**0.6**



[28] The denominator in both 30- and 90- day mortality analyses include patients diagnosed in NHS Tayside (44 (2017); 52 (2018); 35 (2019); and 29 (2020)) 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.

[29] The difference in denominator totals (1 less patient in 90-day reporting in 2018 and 2021 compared to 30-day) 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 but providing 30 days have passed they will be pertinent to the 30-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 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, surgery is performed at the Royal Infirmary of Edinburgh.

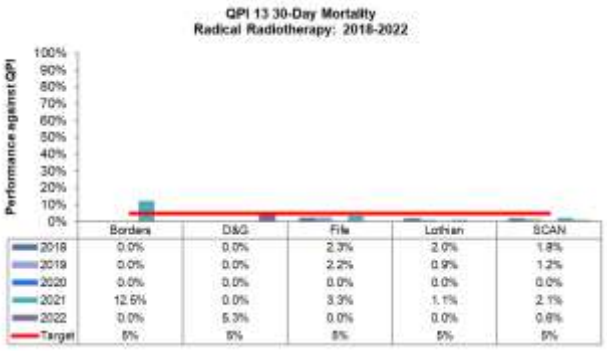
There was 1 death which occurred within 30/90 days of surgery. Results remain within the accepted target parameters and as such are in line with good clinical practice.

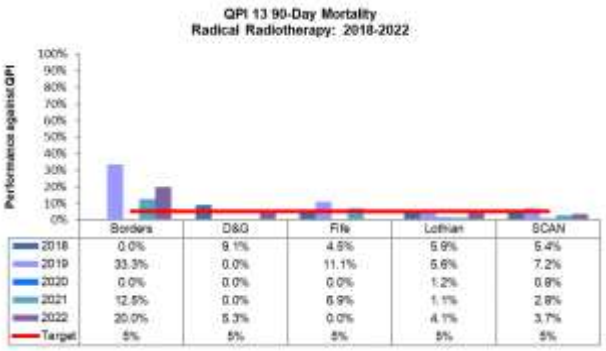
QPI 13 (ii) Radical Radiotherapy: 30- & 90- Day Mortality **Target <5%**

Numerator = Number of patients who receive radical radiotherapy[30] 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
2022 cohort	80	80	146	146	309	309	778	778	1313	1313
Ineligible for this QPI	75	75	127	127	266	267	681	681	1149	1150
Numerator	0	1	1	1	0	0	0	4	1	6
Not recorded for numerator	0	0	0	0	0	0	0	0	0	0
Denominator	5	5	19	19	43*	42*	97	97	164	163
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**	**20.0**	**5.3**	**5.3**	**0.0**	**0.0**	**0.0**	**4.1**	**0.6**	**3.7**

*The denominator in Fife for 30-day is 43 compared to 42 for 90-day mortality. 90 days had not elapsed since treatment for 1 patient who is therefore not included in the 90-day denominator.





Comment: Radical Radiotherapy 30- & 90-Day Mortality

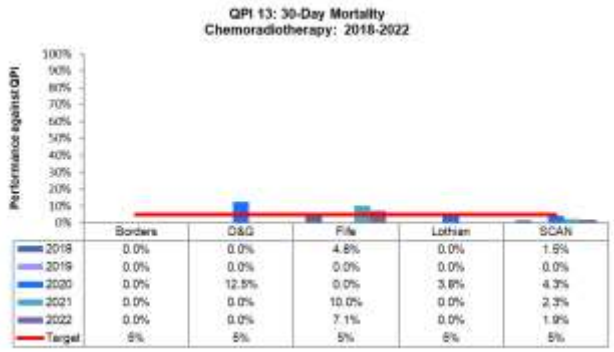
Performance rates can be affected by very small numbers and these should be viewed with a degree of caution. While they may appear excessive, it is important to be cognisant of the 'exaggerated' percentages which can be a consequence of analyses involving small numbers. SCAN results overall remain within the accepted parameters.

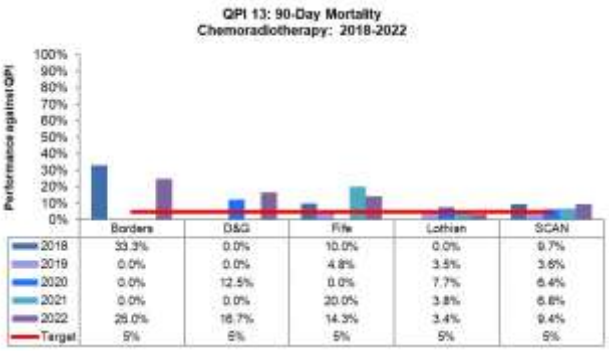
[30] Radical radiotherapy includes conventional radical radiotherapy and SABR.

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
2022 cohort	80	80	146	146	309	309	778	778	1313	1313
Ineligible for this QPI	76	76	140	140	295	295	749	749	1260	1260
Numerator	0	1	0	1	1	2	0	1	1	5
Not recorded for numerator	0	0	0	0	0	0	0	0	0	0
Denominator	4	4	6	6	14	14	29	29	53	53
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**	**25.0**	**0.0**	**16.7**	**7.1**	**14.3**	**0.0**	**3.4**	**1.9**	**9.4**





Comment: Chemoradiotherapy 30- & 90-Day Mortality

The disproportionately high percentages seen in the 90-day mortality analyses for NHS Borders in 2017 (3 out of 8 [33.3%]), 2018 (4 out of 12 [37.5%]) and 2022 (1 out of 4 [25%]); and for NHS Fife in 2021 (2 out of 10 [20.0%]) must be viewed with a degree of caution. These inflated results are due to the consequences small numbers can have on overall results. The relatively high results of 12.5% in NHS D&G and 10.0% in NHS Fife, similarly, are based on small numbers and should not be a cause for unwarranted concern.

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 it reported on surgical, radiotherapy and *all* SACT patients but in 2019 it was limited to curative treatment only, i.e. surgery, radical radiotherapy and radical chemoradiotherapy. 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.

Action: Discussion around curative treatment 'packages' within 30- and 90-day mortality analyses and reporting, is to be taken to the next formal review process.

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

These QPIs are to be 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.

Measurement is being revised to use data from ChemoCare (an electronic chemotherapy prescribing system) in order to utilise existing data and provide an accurate picture of all patients with lung cancer undergoing SACT.

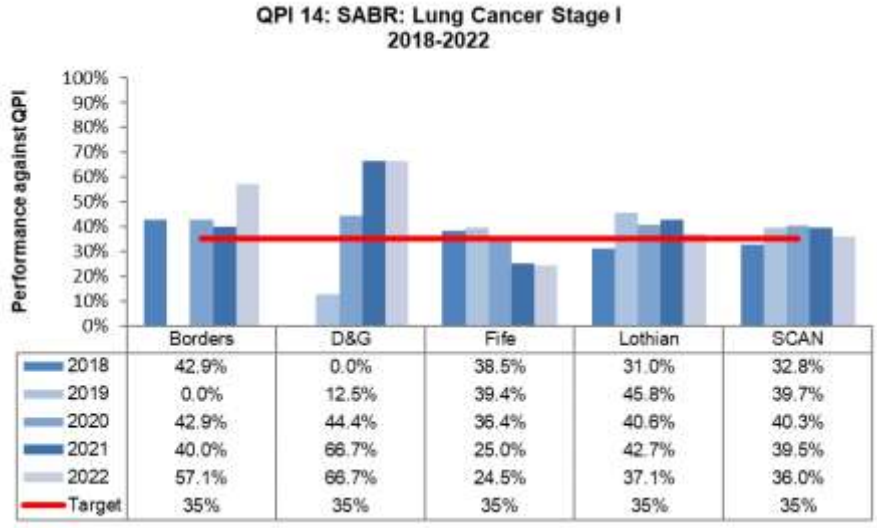
The development of a national reporting tool is currently underway through a collaboration with Public Health Scotland (PHS) and the 3 Cancer Networks: NCA, SCAN and WoSCAN. This is to ensure that reporting is consistent throughout Scotland. Progress has been complicated by the differences in the 5 instances of ChemoCare across Scotland and a date for initial reporting is yet to be confirmed at the time of writing this report.

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 2022**.**

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

Numerator = Number of patients with Stage I[31] lung cancer not undergoing surgery who receive SABR[32].
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.

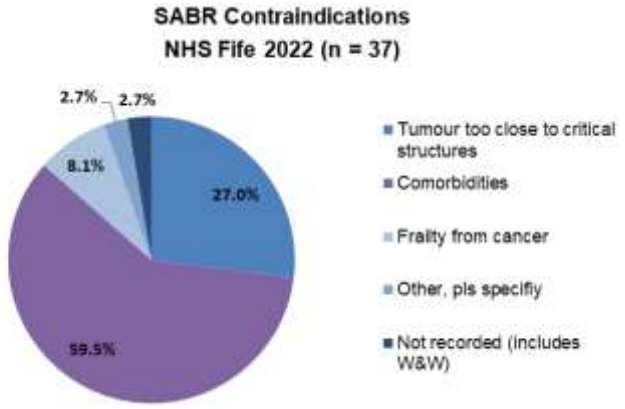
Target 35%	Borders	D&G	Fife	Lothian	SCAN
2022 cohort	80	146	309	778	1313
Ineligible for this QPI	73	111	258	629	1071
Numerator	4	6	12	46	68
Not recorded for numerator	0	0	0	0	0
Denominator	7	9	49	124	189
Not recorded for denominator	0	26	2	25	53
Not recorded for exclusions	0	0	0	0	0
% Performance	**57.1%**	**66.7%**	**24.5%**	**37.1%**	**36.0%**



	Borders	D&G	Fife	Lothian	SCAN
2018	42.9%	0.0%	38.5%	31.0%	32.8%
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%
Target	35%	35%	35%	35%	35%

Comment

As the population ages so the incidence of lung cancer is increasing. 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 QPI was passed by 3 of the 4 SCAN health boards in 2022. The target was not met in NHS Fife with a shortfall of 10.5% (37 cases). The chart below illustrates SABR contraindications for outliers in NHS Fife.



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

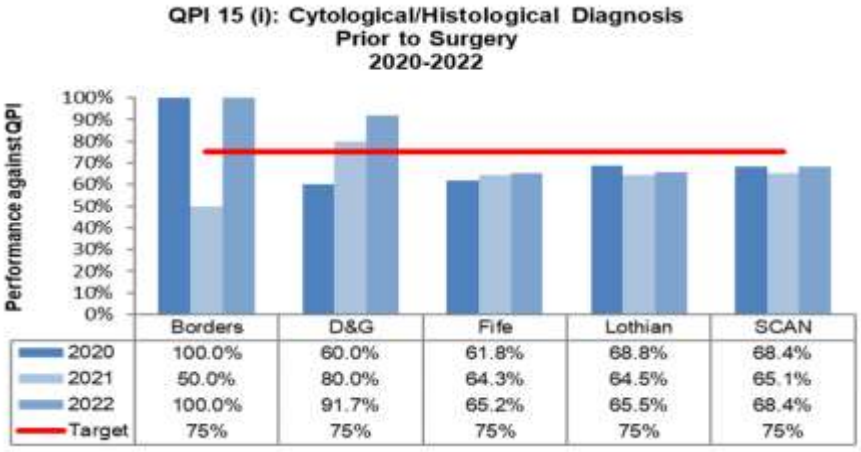
QPI 15 Pre-Treatment Diagnosis

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[33].

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

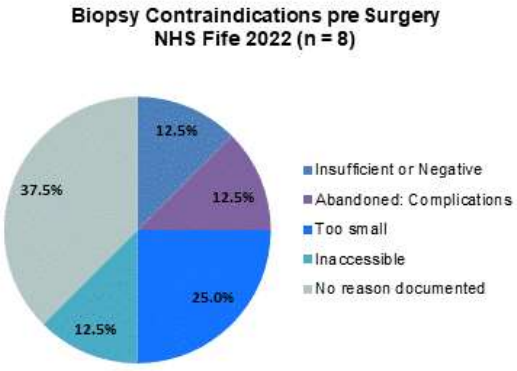
Numerator = Number of patients with lung cancer receiving surgery who have a cytological / histological diagnosis prior to definitive treatment.
Denominator = All patients with lung cancer who receive surgery.
Exclusions = Patients who decline investigations.

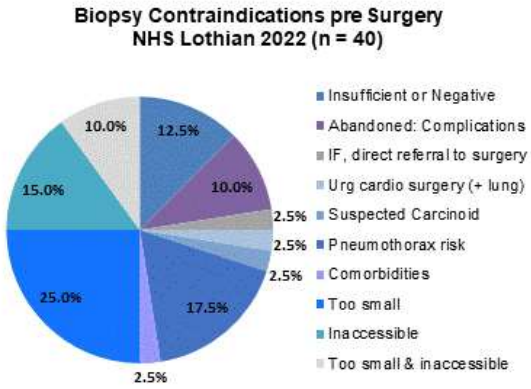
Target 75%	Borders	D&G	Fife	Lothian	SCAN
2022 cohort	80	146	309	778	1313
Ineligible for this QPI	76	134	286	662	1158
Numerator	4	11	15	76	106
Not recorded for numerator	0	0	0	0	0
Denominator	4	12	23	116	155
Not recorded for denominator	0	0	0	0	0
Not recorded for exclusions	0	0	0	0	0
% Performance	**100.0%**	**91.7%**	**65.2%**	**65.5%**	**68.4%**



Comment

In 2022, NHS Fife had a shortfall of 9.8% (18 cases); and NHS Lothian's shortfall was 9.5% (40 cases). Valid clinical reasons have been provided:



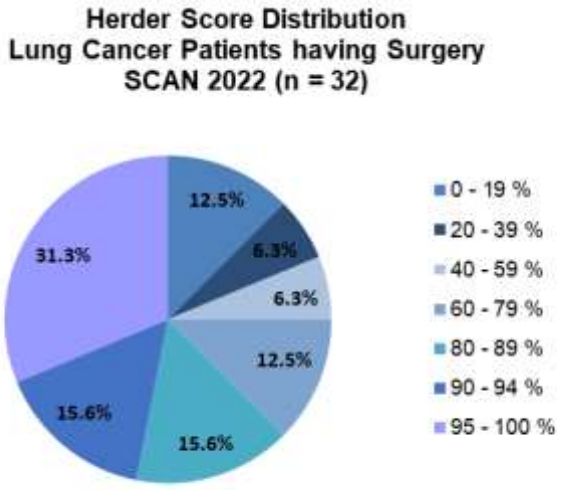


[33] "Rationale and Evidence" from Scottish Government and Healthcare Improvement Scotland: *Scottish Cancer Taskforce: Lung Cancer Clinical Quality Performance Indicators (Version 4.1: September 2021).*

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 therefore inaccessible to biopsy and it can be hard 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. Where histology is not possible the use of Herder score offers an alternative malignancy indicator which can influence treatment decisions, more particularly radical options such as surgical intervention or radical radiotherapy.

A study by Bain, L et al[34] had recommended the use of Herder score (based on PET, size, characteristics of the tumour and smoking status). The Herder score looks at the probability of cancer as an alternative non-invasive option to confirm the 'likelihood' of malignancy. A Herder of 90% and above is a good indication that radical treatment is appropriate. Growth over serial CT scans in conjunction with Herder can also indicate that radical treatment is appropriate.

	Fife	Lothian	SCAN
Herder recorded	5	27	32
Herder not recorded	2	1	3
Over 30mm: n/a	-	4	4
No PET: n/a	1	8	9



The action plan in 2019 prompted the recording of Herder by the MDT which, by 2022 is generally embedded in MDT practice. There were 2 cases in Fife (1 of whom had PET CT after MDM) and 1 in Lothian where Herder was not documented.

Action: to continue recording Herder at MDT meetings. An audit[35] was undertaken in 2021 and is to be replicated for 2022 data with comparisons drawn to assess appropriateness of radical treatment (surgical resection and radical radiotherapy) for patients without histological diagnoses.

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

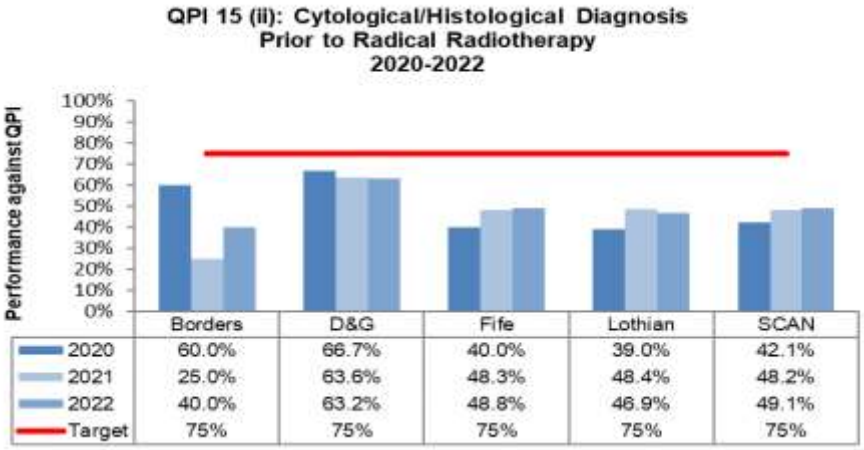
[34] Bain L, Hainey S, Henderson W, Reid PA (Respiratory dept, Western General Hospital, Edinburgh), 2020: *Lung Cancer Patients Without Tissue Diagnosis in NHS Lothian 2016 – 2018*. The full Audit can be found in the 2020 Lung Cancer QPI Report which is available on the SCAN website.

[35] Marshall, A. *QPI 15 Audit: Lung Cancer Pre-Treatment Pathological Confirmation: prior to Surgery and Radical Radiotherapy 2021*. The full Audit can be found in the 2021 Lung Cancer QPI Report available on the SCAN website (www.scan.scot.nhs.uk).

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.

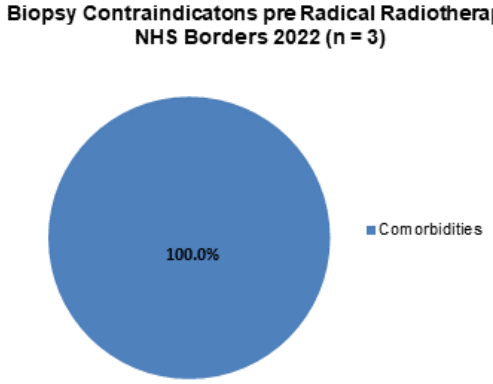
Target 75%	Borders	D&G	Fife	Lothian	SCAN
2022 cohort	80	146	309	778	1313
Ineligible for this QPI	75	127	266	682	1150
Numerator	2	12	21	45	80
Not recorded for numerator	0	1	0	0	1
Denominator	5	19	43	96	163
Not recorded for denominator	0	0	0	0	0
Not recorded for exclusions	0	0	0	0	0
% Performance	**40.0%**	**63.2%**	**48.8%**	**46.9%**	**49.1%**

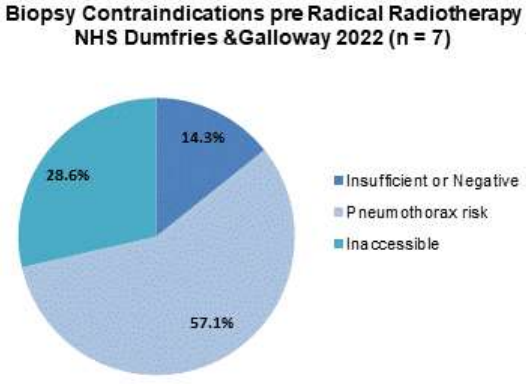


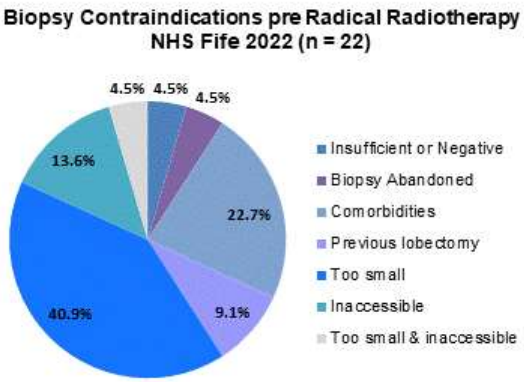
Comment

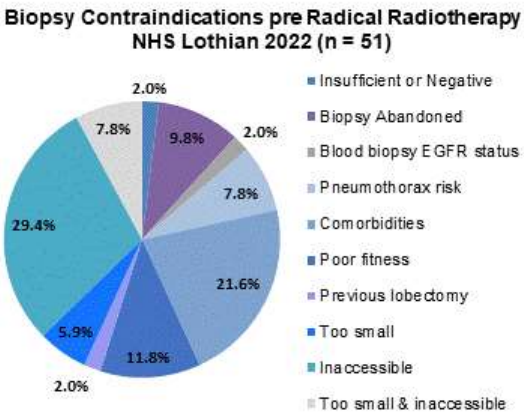
Allowances should be made where small numbers and variation may be due to chance. Aggregation of results over time may be useful to clarify results where numbers are small. It should be noted that disproportionate percentages are often a consequence of the analyses of small number cohorts.

The target has been consistently missed across the SCAN region and this QPI continues to be challenging; although the impact of small numbers should not be ignored, more particularly regarding the percentage values evidenced in 'shortfalls', i.e. the difference between the target and actual performance. In 2022, NHS Borders had a shortfall of 35% (3 cases); D&G 11.8% (7 cases); NHS Fife 26.2% (22 cases); and NHS Lothian 28.1% (51 cases). Valid clinical reasons have been demonstrated:



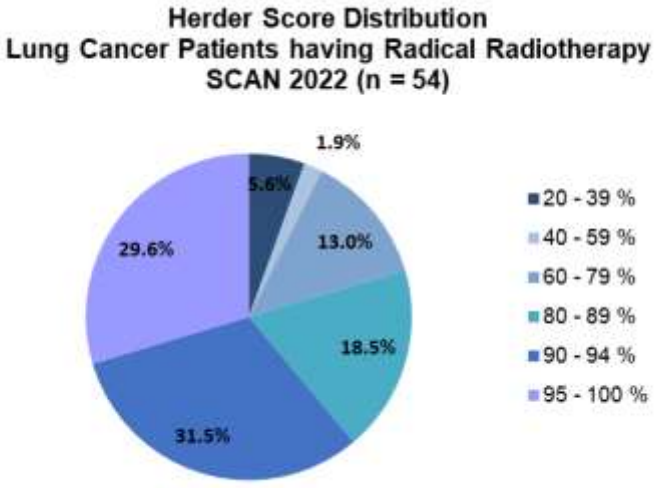






Similarly, to QPI 15 (i), obtaining histology or cytology prior to radical radiotherapy is not always considered the most appropriate course of action nor always in the patient's best interest. Generally rates of pre-treatment tissue diagnosis were better for patients who received surgery compared with radical radiotherapy, which is likely to reflect a fitter patient population more suitable to undergo diagnostic procedures existing in the surgical group. All patients are discussed fully by MDT so that all approaches are considered and that all proper processes take their course including the recording of Herder scores as markers of malignancy and used to ascertain the appropriateness of radical radiotherapy relating particularly to this QPI.

	Borders	D&G	Fife	Lothian	SCAN
Herder recorded	3	5	16	30	54
Herder not recorded	-	1	1	7	9
Over 30mm: n/a	-	-	5	11	16
No PET: n/a	-	-	-	3	3



A Herder of 90% and above is a good indication that radical treatment is appropriate with just over 60% of outliers (i.e. those with imaging diagnoses) meeting this criterion for patients who go on to have radical radiotherapy, as shown above. Growth over serial CT scans in conjunction with Herder can also indicate malignancy.

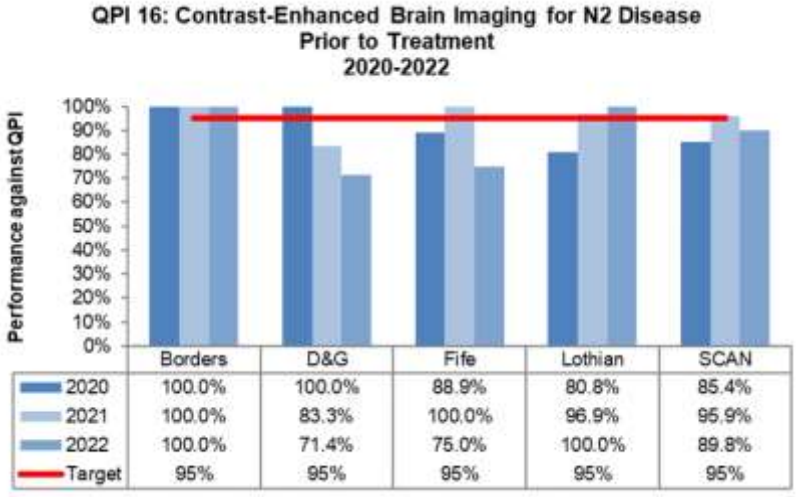
Action: to continue recording Herder at MDT meetings. An audit[36] was undertaken in 2021and is to be replicated for 2022 data with comparisons drawn to assess appropriateness of radical treatment (surgical resection and radical radiotherapy) for patients without histological diagnoses.

[36] Marshall, A. *QPI 15 Audit: Lung Cancer Pre-Treatment Pathological Confirmation: prior to Surgery and Radical Radiotherapy 2021*. The full Audit can be found in the 2021 Lung Cancer QPI Report available on the SCAN website (www.scan.scot.nhs.uk).

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[37].
Exclusions = Patients who decline brain imaging and patients diagnosed with SCLC.

Target 95%	Borders	D&G	Fife	Lothian	SCAN
2022 cohort	80	146	309	778	1313
Ineligible for this QPI	77	138	295	749	1259
Numerator	3	5	9	27	44
Not recorded for numerator	0	0	0	0	0
Denominator	3	7	12	27	49
Not recorded for denominator	0	1	2	2	5
Not recorded for exclusions	0	0	0	0	0
% Performance	**100.0%**	**71.4%**	**75.0%**	**100.0%**	**89.8%**



Comment
The denominator criteria generate very small cohorts. Results should therefore be viewed with a degree of caution as they may simply be a consequence of small numbers and variation might be due to chance.

The target was not met by NHS D&G with a shortfall of 23.6% (2 cases) or by NHS Fife where there was a shortfall of 25% (3 cases) in NHS Fife. These disproportionate shortfalls are a consequence of small numbers' analyses.

Brain imaging not performed	**D&G**	**Fife**
Brain imaging after treatment had started	1	
Brain scan performed outwith Scotland	1	
Treatment intent uncertain at time of MDT meeting		3

It should be noted that it can be clinically appropriate to go ahead with emergency and urgent treatment (undertaken prior to CT Head) for best patient outcomes.

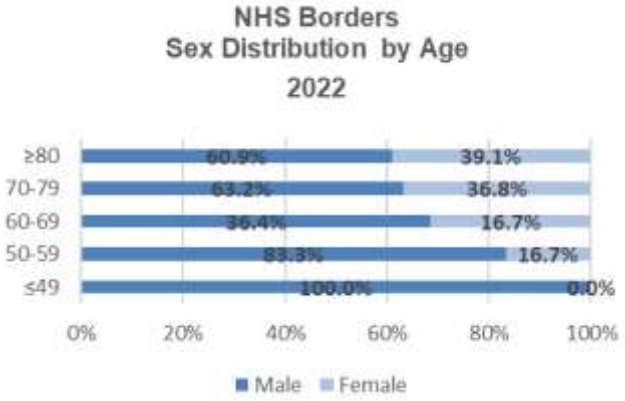
Action: NHS D&G and NHS Fife – Treatment intent to be fully discussed and documented by MDT and all appropriate patients referred for or have undergone brain imaging prior to definitive treatment. Any doubts pertaining to planned treatment intent to be documented at MDT. Stage to be documented by MDT.

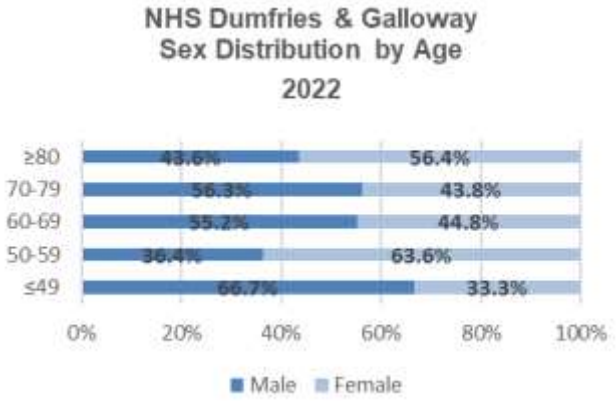
[37] Curative treatment: radical radiotherapy, radical chemoradiotherapy or surgical resection.

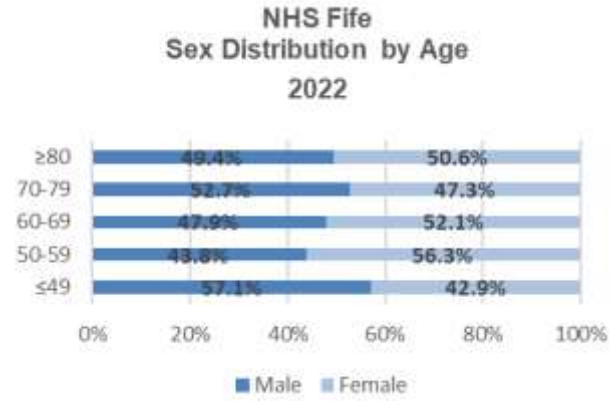
Appendices
Appendix 1: Key Categories

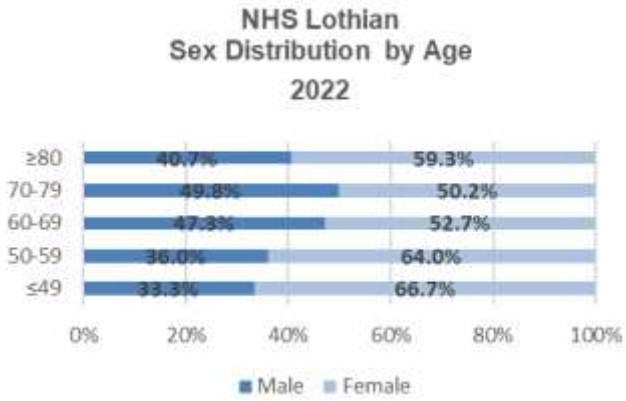
Tables: Patients diagnosed with lung cancer January to December 2022
Charts: Patients diagnosed with lung cancer January to December 2022 or cumulative results over a series of years as indicated.

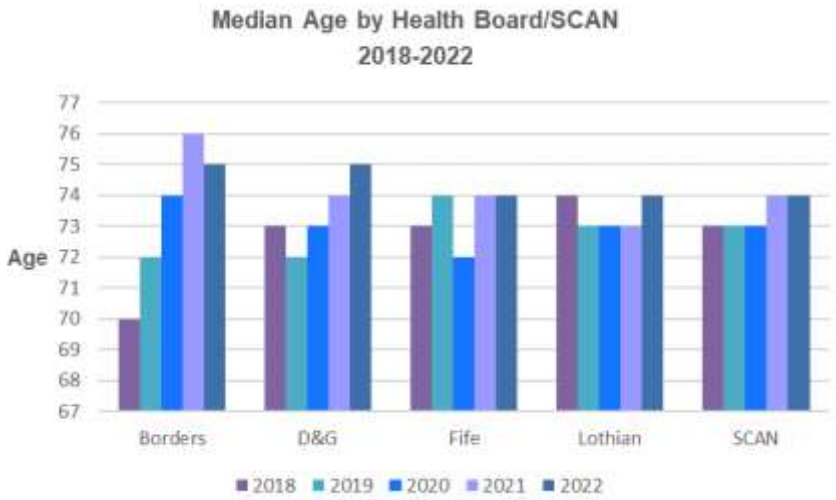
Age & Sex Distribution 2022	Borders	D&G	Fife	Lothian	SCAN
Age: Median	75	75	74	74	74
Age: Range	46-95	39-96	43-97	34-95	34-97

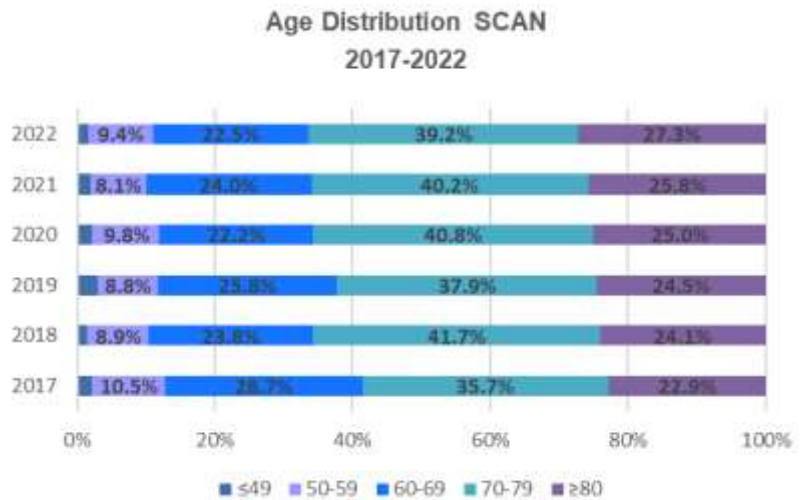






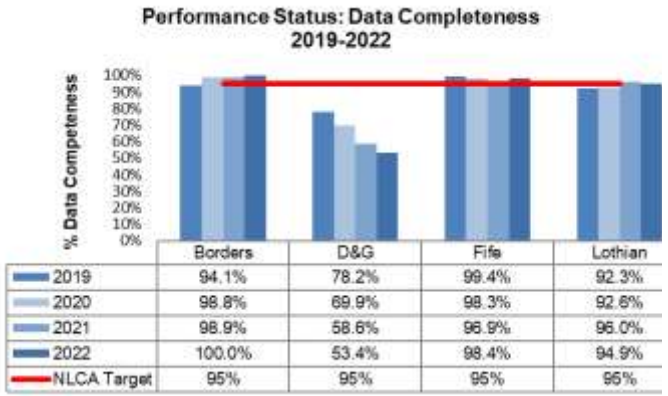






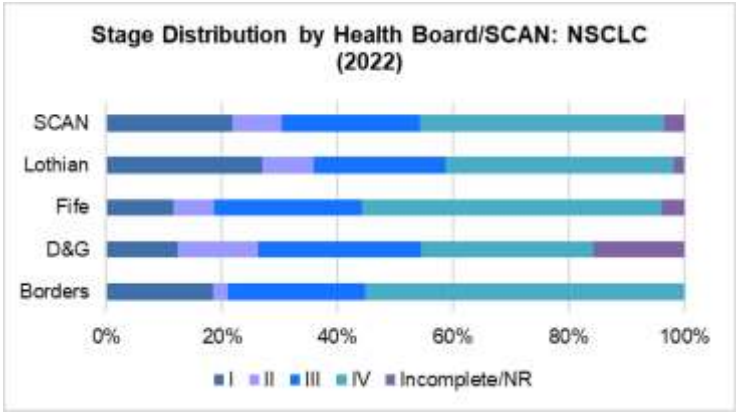
Performance Status (PS): All patients diagnosed with lung cancer
2022

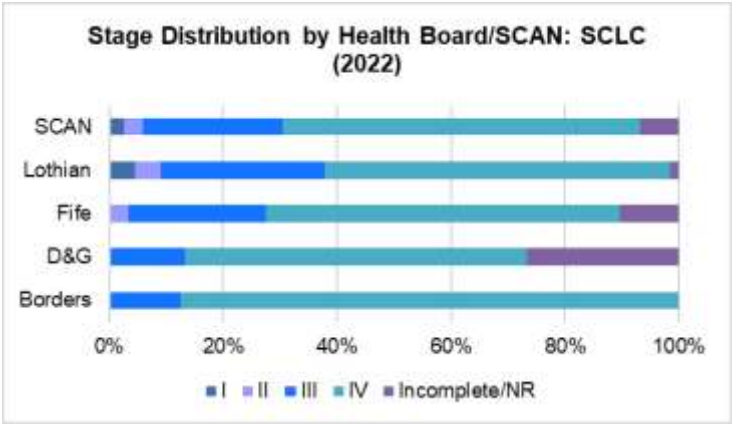
	Borders		D&G		Fife		Lothian		SCAN	
PS 0	9	11.3%	7	4.8%	20	6.5%	92	11.8%	128	9.7%
PS 1	28	35.0%	39	26.7%	84	27.2%	240	30.8%	391	29.8%
PS 2	21	26.3%	21	14.4%	84	27.2%	169	21.7%	295	22.5%
PS 3	17	21.3%	10	6.8%	80	25.9%	154	19.8%	261	19.9%
PS 4	5	6.3%	1	0.7%	36	11.7%	83	10.7%	125	9.5%
Not recorded	-	0.0%	68	46.6%	5	1.6%	40	5.1%	113	8.6%
Total	**80**		**146**		**309**		**778**		**1313**	

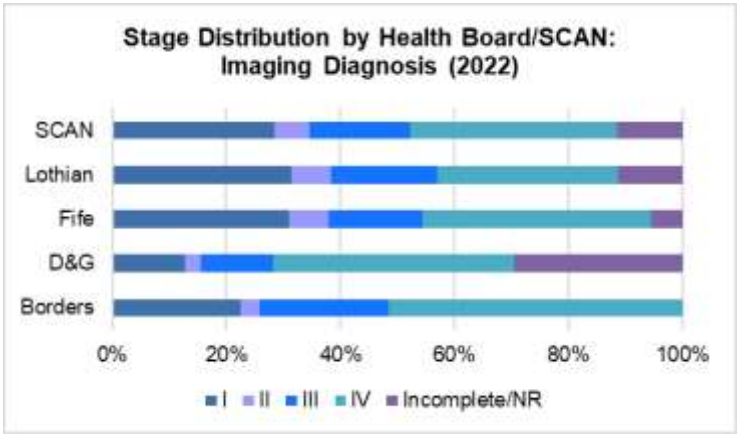


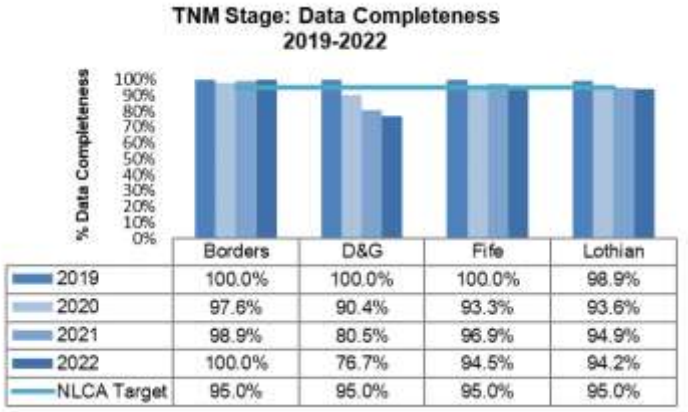
Data completeness is useful in providing a benchmark for robust and comprehensive results. It is therefore vital that high levels should be maintained. Recording of performance status has steadily fallen in Dumfries and Galloway over the last 4 years and an action has been put in place, as part of this report, to encourage more complete PS reporting at MDT meetings. Improvements are anticipated in 2023 results.

Stage Grouping: All patients diagnosed with lung cancer 2022	Borders		D&G		Fife		Lothian		SCAN	
I	14	17.5%	16	11.0%	62	20.1%	211	27.1%	303	23.1%
II	2	2.5%	10	6.8%	20	6.5%	59	7.6%	91	6.9%
III	19	23.8%	29	19.9%	66	21.4%	169	21.7%	283	21.6%
IV	45	56.3%	57	39.0%	144	46.6%	294	37.8%	540	41.1%
Incomplete	-	0.0%	5	3.4%	12	3.9%	14	1.8%	31	2.4%
Not recorded	-	0.0%	29	19.9%	5	1.6%	31	4.0%	65	5.0%
Total	**80**		**146**		**309**		**778**		**1313**	





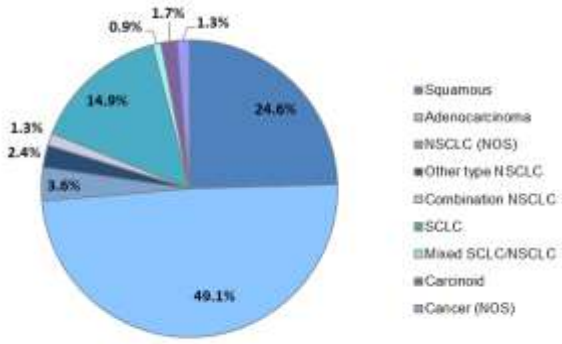




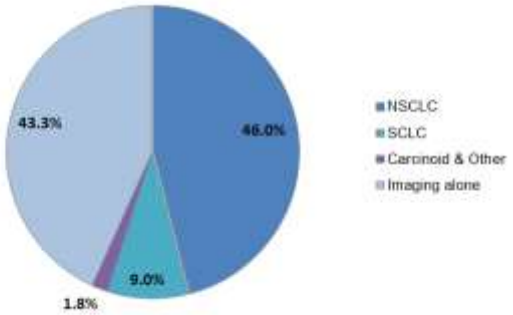
	Borders	D&G	Fife	Lothian
2019	100.0%	100.0%	100.0%	98.9%
2020	97.6%	90.4%	93.3%	93.6%
2021	98.9%	80.5%	96.9%	94.9%
2022	100.0%	76.7%	94.5%	94.2%
NLCA Target	95.0%	95.0%	95.0%	95.0%

Pathology Type										
2022	**Borders**		**D&G**		**Fife**		**Lothian**		**SCAN**	
Squamous	9	11.3%	22	15.1%	41	13.3%	111	14.3%	183	13.9%
Adenocarcinoma	28	35.0%	33	22.6%	75	24.3%	230	29.6%	366	27.9%
NSCLC (NOS)	3	3.8%	2	1.4%	8	2.6%	14	1.8%	27	2.1%
Other specific NSCLC	1	1.3%	-	0.0%	3	1.0%	14	1.8%	18	1.4%
NSCLC combination	-	0.0%	-	0.0%	2	0.6%	8	1.0%	10	0.8%
SCLC	8	10.0%	14	9.6%	27	8.7%	62	8.0%	111	8.5%
SCLC/NSCLC mixed	-	0.0%	1	0.7%	2	0.6%	4	0.5%	7	0.5%
Carcinoid	-	0.0%	1	0.7%	4	1.3%	8	1.0%	13	1.0%
Other malignancy	-	0.0%	2	1.4%	2	0.6%	6	0.8%	10	0.8%
Negative Pathology	1	1.3%	4	2.7%	7	2.3%	33	4.2%	45	3.4%
Declined Investigation	-	0.0%	12	8.2%	7	2.3%	50	6.4%	69	5.3%
No Pathology	30	37.5%	55	37.7%	131	42.4%	238	30.6%	454	34.6%
Not recorded	-	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%
NSCLC	41	51.3%	57	39.0%	129	41.7%	377	48.5%	604	46.0%
SCLC	8	10.0%	15	10.3%	29	9.4%	66	8.5%	118	9.0%
Carcinoid & other	0	0.0%	3	2.1%	6	1.9%	14	1.8%	23	1.8%
Radiological diagnosis	31	38.8%	71	48.6%	145	46.9%	321	41.3%	568	43.3%

Pathology Subtypes Lung Cancer 2022
SCAN Region (n=745)

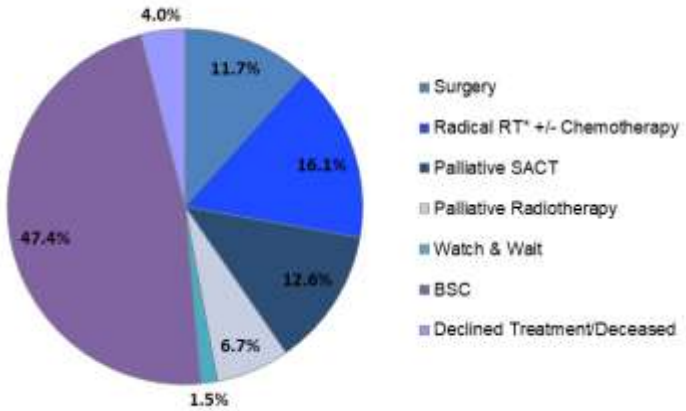


Pathological Diagnosis Lung Cancer 2022
SCAN Region (n=1313)

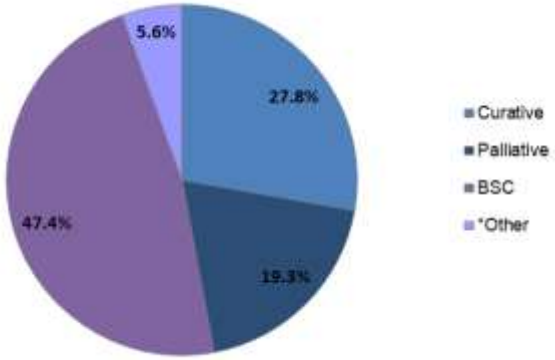


First Treatment 2022	Borders		D&G		Fife		Lothian		SCAN	
Surgery	4	5.0%	12	8.2%	23	7.4%	114	14.7%	153	11.7%
SABR	4	5.0%	7	4.8%	12	3.9%	47	6.0%	70	5.3%
Radical Radiotherapy	1	1.3%	10	6.8%	31	10.0%	47	6.0%	89	6.8%
Chemoradiotherapy	4	5.0%	6	4.1%	14	4.5%	29	3.7%	53	4.0%
Palliative Chemotherapy	5	6.3%	8	5.5%	12	3.9%	26	3.3%	51	3.9%
Chemoimmunotherapy	3	3.8%	-	0.0%	11	3.6%	30	3.9%	44	3.4%
Immunotherapy	1	1.3%	3	2.1%	11	3.6%	31	4.0%	46	3.5%
Targeted Therapy	3	3.8%	-	0.0%	5	1.6%	16	2.1%	24	1.8%
Palliative Radiotherapy	9	11.3%	8	5.5%	21	6.8%	50	6.4%	88	6.7%
Watchful Waiting	-	0.0%	2	1.4%	4	1.3%	14	1.8%	20	1.5%
Best Supportive Care (BSC)	39	48.8%	85	58.2%	152	49.2%	346	44.5%	622	47.4%
Declined all therapies	3	3.8%	1	0.7%	3	1.0%	15	1.9%	22	1.7%
Died before treatment	4	5.0%	4	2.7%	10	3.2%	13	1.7%	31	2.4%
Total	**80**		**146**		**309**		**778**		**1313**	

First Treatment Lung Cancer 2022
SCAN Region (n=1313)



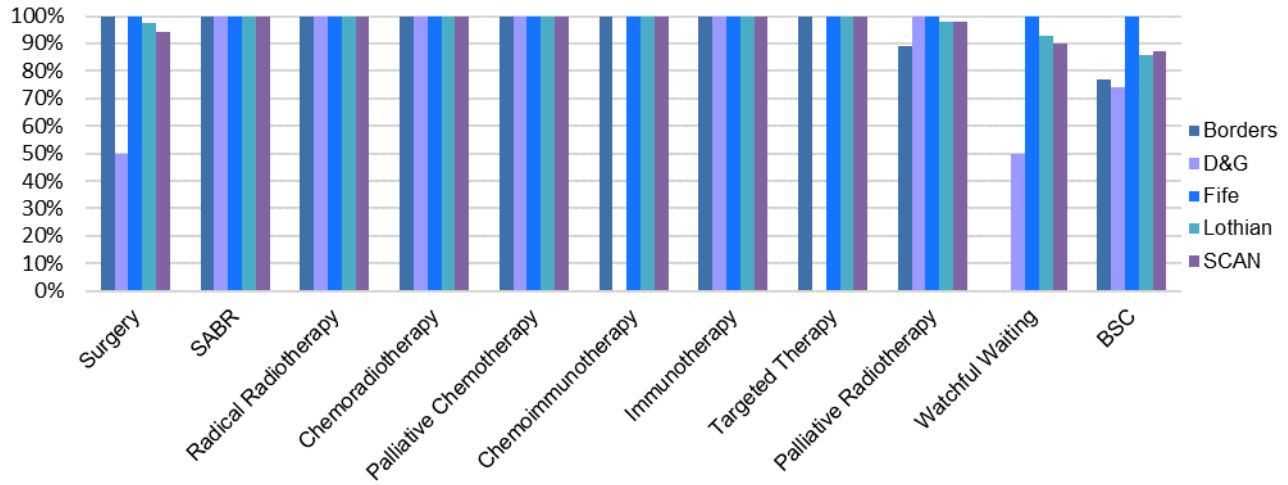
First Treatment by Type Lung Cancer 2022
SCAN Region (n=1313)



***** Radical RT includes SABR or conventional radical radiotherapy

Lung Clinical Nurse Specialists 2022	Borders		D&G		Fife		Lothian		SCAN	
Contact with LCNS	69	86.3%	115	78.8%	284	91.9%	721	92.7%	1189	90.6%

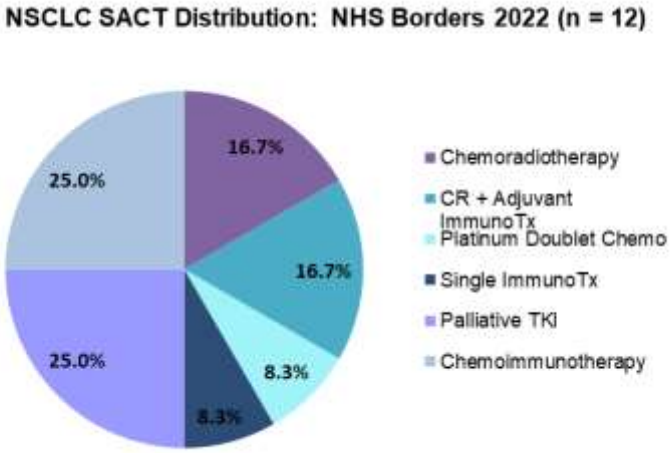
% Patients seen by LCNS by First Treatment by Health Board in SCAN Region 2022

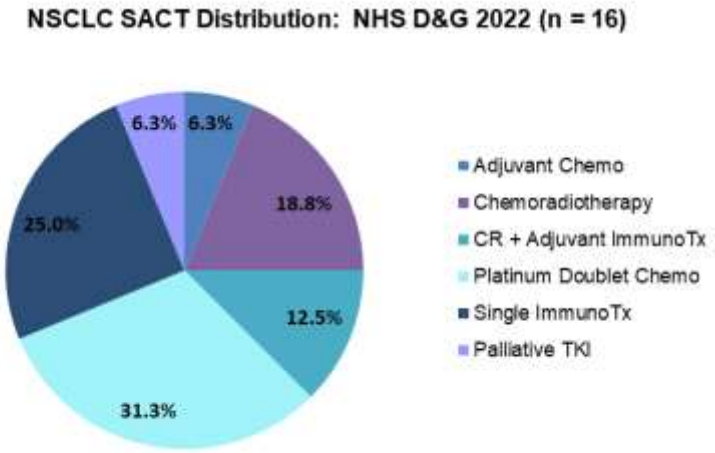


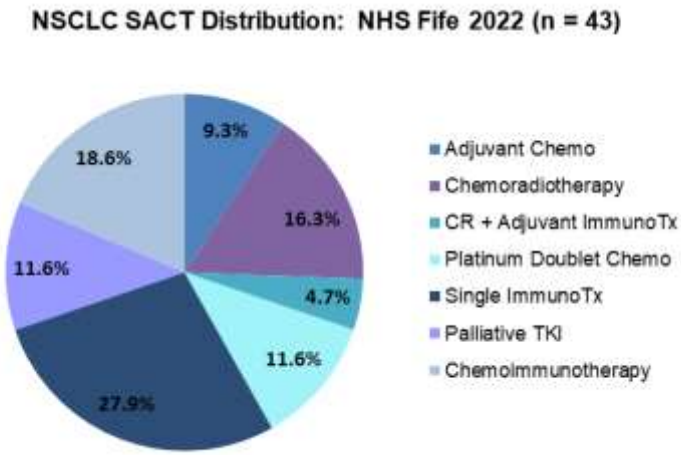
Surgical Resection 2022	Borders		D&G		Fife		Lothian		SCAN	
Pneumonectomy	-	-	-	-	2	8.7%	6	5.2%	8	5.2%
Lobectomy	1	25.0%	9	75.0%	20	87.0%	100	86.2%	130	83.9%
Wedge	-	-	3	25.0%	1	4.3%	5	4.3%	9	5.8%
Segmental	3	75.0%	-	-	-	-	5	4.3%	8	5.2%
Other surgery	-	-	-	-	-	-	-	-	-	-
Total	4		12		23		116		155	
Declined Surgery	-		-		1		11		12	
Died before Surgery	-		-		-		-		-	
% Lung Cancer Patients having Surgery		**5.0%**		**8.2%**		**7.4%**		**14.9%**		**11.8%**

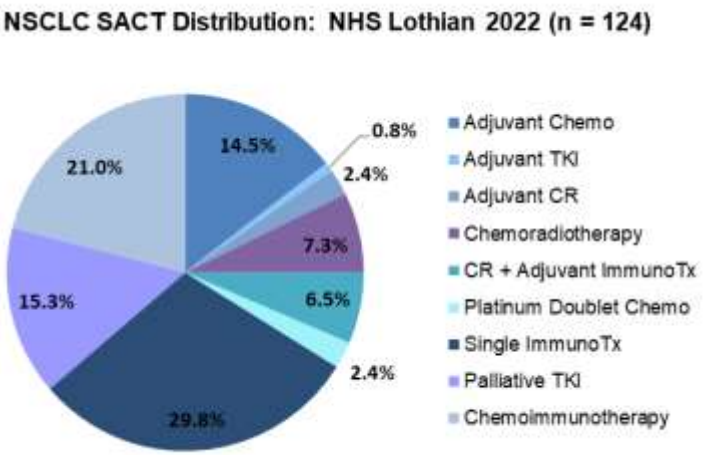
SACT: NSCLC 2022	Borders		D&G		Fife		Lothian		SCAN	
CURATIVE										
Adjuvant chemotherapy										
Adjuvant TKI	-	0.0%	1	6.3%	4	9.3%	18	14.5%	23	11.8%
Adjuvant immunotherapy	-	0.0%	-	0.0%	-	0.0%	1	0.8%	1	0.5%
Adjuvant chemoradiotherapy*	-	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%
Chemoradiotherapy*	-	0.0%	-	0.0%	-	0.0%	3	2.4%	3	1.5%
Chemoradiotherapy + adjuvant immunotherapy	2	16.7%	3	18.8%	7	16.3%	9	7.3%	21	10.8%
	2	16.7%	2	12.5%	2	4.7%	8	6.5%	14	7.2%
PALLIATIVE										
Platinum doublet chemotherapy	1	8.3%	5	31.3%	5	11.6%	3	2.4%	14	7.2%
Single agent immunotherapy	1	8.3%	4	25.0%	12	27.9%	37	29.8%	54	27.7%
Palliative TKI	3	25.0%	1	6.3%	5	11.6%	19	15.3%	28	14.4%
Palliative chemoimmunotherapy	3	25.0%	-	0.0%	8	18.6%	26	21.0%	37	19.0%
TOTAL	**12**		**16**		**43**		**124**		**195**	
Declined SACT	2	4.9%	2	3.5%	6	4.7%	33	8.8%	43	7.1%
Patient died before SACT	3	7.3%	-	0.0%	1	0.8%	3	0.8%	7	1.2%
Distribution of SACT										
Curative	4	33.3%	6	37.5%	13	30.2%	39	31.5%	62	31.8%
Palliative	8	66.7%	10	62.5%	30	69.8%	85	68.5%	133	68.2%
Total NSCLC & % receiving SACT	**41**	**29.3%**	**57**	**28.1%**	**129**	**33.3%**	**377**	**32.9%**	**604**	**32.3%**

SACT Distribution by Health Board: Patients diagnosed with NSCLC in 2022



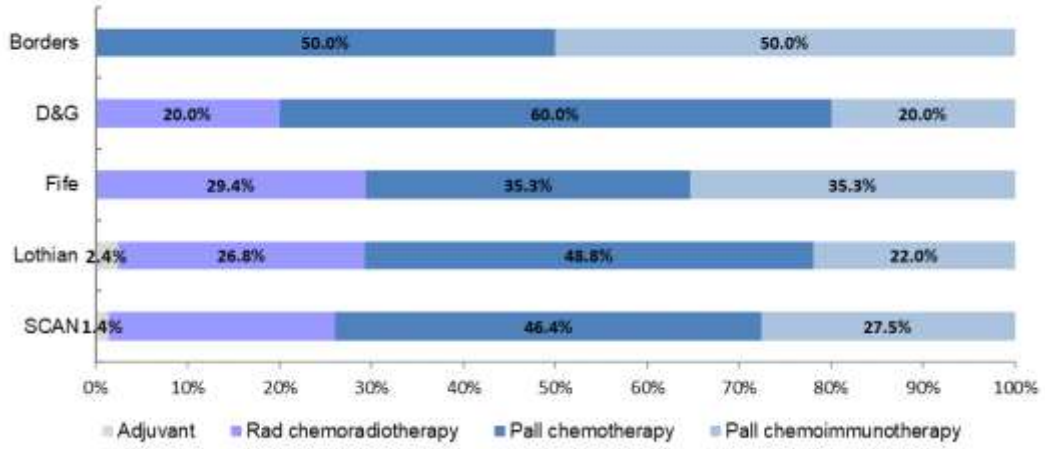






SACT: SCLC 2022	Borders		D&G		Fife		Lothian		SCAN	
Adjuvant* chemotherapy	-	0.0%	-	0.0%	-	0.0%	1	2.4%	1	1.4%
Radical Chemoradiotherapy	-	0.0%	1	20.0%	5	29.4%	11	26.8%	17	24.6%
Palliative chemotherapy	3	50.0%	3	60.0%	6	35.3%	20	48.8%	32	46.4%
Palliative chemoimmunotherapy	3	50.0%	1	20.0%	6	35.3%	9	22.0%	19	27.5%
TOTAL	**6**		**5**		**17**		**41**		**69**	
Declined SACT	-	-	6	40.0%	-	0.0%	6	9.1%	12	10.2%
Patient died before SACT	-	-	-	0.0%	1	3.4%	-	0.0%	1	0.8%
Total SCLC & % receiving SACT	**8**	**75.0%**	**15**	**33.3%**	**29**	**58.6%**	**66**	**62.1%**	**118**	**58.5%**

SACT Distribution by Health Board/SCAN Region: Patients diagnosed with SCLC in 2022

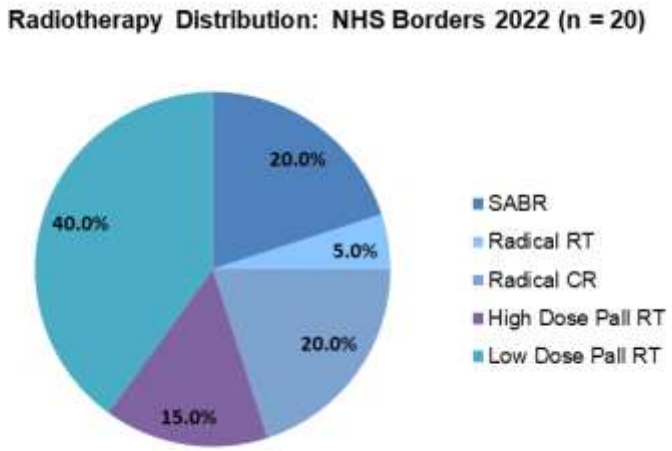


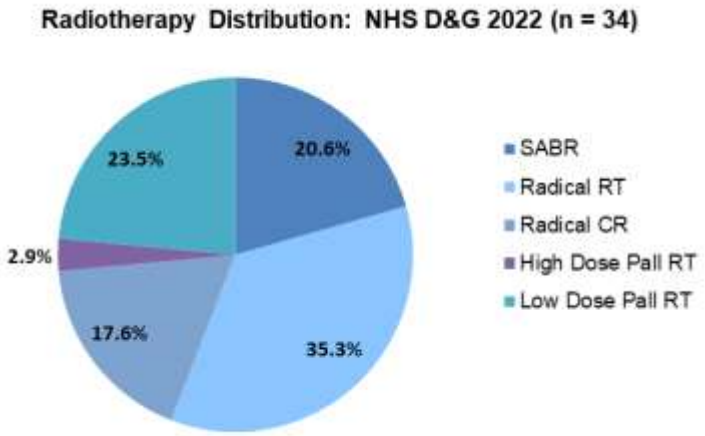
*ADJUVANT treatment in the above table refers only to adjuvant **chemotherapy following surgery.** A further possible adjuvant SACT treatment for patients diagnosed with SCLC and following on from surgery is chemoradiotherapy. Adjuvant SACT numbers in total are shown below:

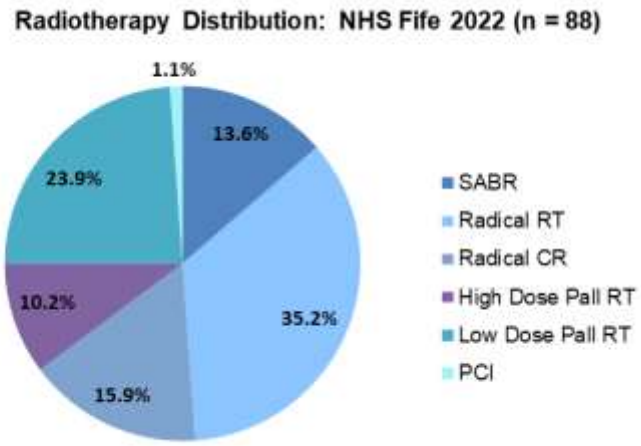
	Borders	D&G	Fife	Lothian	SCAN
Post-Surgery					
Adjuvant chemotherapy	-	-	-	1	1
Adjuvant chemoradiotherapy	-	-	-	-	-

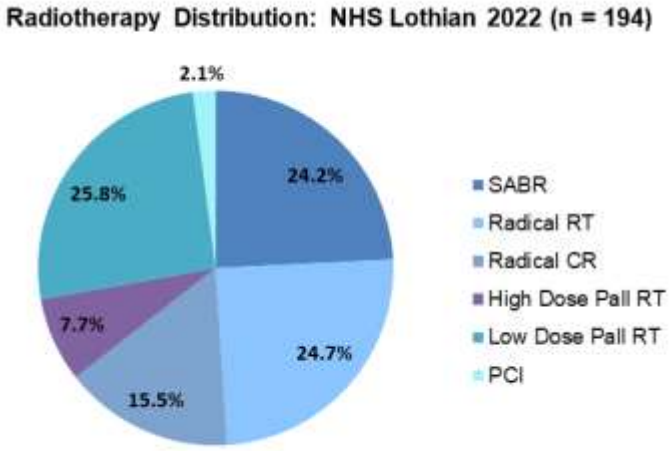
Radiotherapy 2022	Borders		D&G		Fife		Lothian		SCAN	
Adjuvant radiotherapy	-	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%
Radical radiotherapy: SABR	4	20.0%	7	20.6%	12	13.6%	47	24.2%	70	20.8%
Radical radiotherapy: conventional	1	5.0%	12	35.3%	31	35.2%	48	24.7%	92	27.4%
Radical chemoradiotherapy (CR)	4	20.0%	6	17.6%	14	15.9%	30	15.5%	54	16.1%
High dose palliative radiotherapy	3	15.0%	1	2.9%	9	10.2%	15	7.7%	28	8.3%
Low dose palliative radiotherapy	8	40.0%	8	23.5%	21	23.9%	50	25.8%	87	25.9%
Prophylactic Cranial Irradiation (PCI)	-	0.0%	-	0.0%	1	1.1%	4	2.1%	5	1.5%
TOTAL	**20**		**34**		**88**		**194**		**336**	
Declined radiotherapy	3	3.8%	2	1.4%	-	0.0%	16	2.1%	21	1.6%
Patient died before radiotherapy	3	3.8%	-	0.0%	-	0.0%	2	0.3%	5	0.4%
Distribution of Radiotherapy										
Radical	9	45.0%	25	73.5%	57	64.8%	125	64.4%	216	64.3%
Palliative	11	55.0%	9	26.5%	31	35.2%	69	35.6%	120	35.7%
Total lung cancer & % receiving RT	**89**	**25.0%**	**133**	**23.3%**	**321**	**28.5%**	**733**	**24.9%**	**1276**	**25.6%**

Radiotherapy Distribution by Health Board: Patients diagnosed with Lung Cancer in 2022









Appendix 2: Historical QPI Attainment Summary – 2021

QPI Attainment Summary 2021		Target %	Borders		D&G		Fife		Lothian		SCAN	
QPI 1 MDT discussion		95	N 89 D 89	100%	N 131 D 133	98.5%	N 318 D 321	99.1%	N 701 D 730	96.0%	N 1239 D 1273	97.3%
QPI 2 Pathological Diagnosis	All patients with lung cancer	80	N 37 D 68	54.4%	N 79 D 106	74.5%	N 161 D 200	80.5%	N 374 D 485	77.1%	N 651 D 859	75.8%
	NSCLC with sub-type identified	90	N 33 D 35	94.3%	N 69 D 72	95.8%	N 156 D 168	92.9%	N 331 D 349	94.8%	N 589 D 624	94.4%
	Non-Squamous, III-IV: Oncogenic Profiling	80	N 19 D 22	86.4%	N 31 D 35	88.6%	N 79 D 87	90.8%	N 141 D 148	95.3%	N 270 D 292	92.5%
	NSCLC IIIB-IV: PDL1 testing	80	N 21 D 24	87.5%	N 45 D 50	90.0%	N 114 D 127	89.8%	N 219 D 231	94.8%	N 399 D 432	92.4%
QPI 4 PET CT for NSCLC within 10 days from request to report		95	N 1 D 13	7.7%	N 5 D 23	21.7%	N 15 D 47	31.9%	N 19 D 146	13.0%	N 40 D 229	17.5%
QPI 5 Nodal Sampling to confirm Mediastinal Malignancy		80	N 4 D 5	80.0%	N 9 D 10	90.0%	N 8 D 12	66.7%	N 42 D 51	82.4%	N 63 D 78	80.8%
*QPI 6 Surgical resection in NSCLC	All NSCLC	20	N 10 D 35	28.6%	N 14 D 72	19.4%	N 29 D 168	17.3%	N 88 D 349	25.2%	N 141 D 624	22.6%
	NSCLC stage I-II	60	N 9 D 11	81.8%	N 11 D 12	91.7%	N 22 D 32	68.8%	N 77 D 109	70.6%	N 119 D 164	72.6%
*QPI 7 Lymph node assessment for NSCLC patients having pneumonectomy or lobectomy		80	Analysis is by Hospital of Surgery – RIE:						N 107 D 136	78.7%	n/a	
QPI 8 Radiotherapy (including SABR) for inoperable lung cancer		35	N 7 D 21	33.3%	N 5 D 14	35.7%	N 26 D 73	35.6%	N 95 D 202	47.0%	N 133 D 310	42.9%
QPI 9 Chemoradiotherapy for locally advanced NSCLC		50	N 1 D 1	100%	N 0 D 0	n/a	N 2 D 3	66.7%	N 10 D 16	62.5%	N 13 D 20	65.0%
QPI 10 Chemoradiotherapy for limited stage SCLC		70	N 0 D 0	n/a	N 1 D 1	100%	N 2 D 2	100%	N 2 D 4	50.0%	N 5 D 7	71.4%
QPI 11 SACT for patients with NSCLC	All types of SACT for NSCLC	35	N 14 D 25	56.0%	N 19 D 49	38.8%	N 48 D 125	38.4%	N 93 D 238	39.1%	N 174 D 437	39.8%
	Targeted Therapy for NSCLC, stages IIIB-IV	80	N 1 D 1	100%	N 3 D 3	100%	N 9 D 10	90.0%	N 11 D 13	84.6%	N 24 D 27	88.9%

QPI Attainment Summary 2021		Target %	Borders		D&G		Fife		Lothian		SCAN	
	Immunotherapy for NSCLC, stages IIIB-IV	40	N 6 D 13	46.2%	N 6 D 13	46.2%	N 18 D 45	40.0%	N 27 D 66	40.9%	N 57 D 137	41.6%
QPI 12 SACT for patients with SCLC	All types of chemotherapy for SCLC	70	N 3 D 3	100%	N 6 D 8	75.0%	N 14 D 19	73.7%	N 46 D 65	70.8%	N 69 D 95	72.6%
	Palliative chemotherapy for SCLC for treatment with non-curative intent	50	N 3 D 3	100%	N 2 D 4	50.0%	N 11 D 16	68.8%	N 41 D 58	70.7%	N 57 D 81	70.4%
*QPI 13.1 30 Day Mortality After Treatment	*Surgery	<5	Analysis is by Hospital of Surgery – RIE:						N 4 D 157	2.5%	n/a	
	Radical Radiotherapy	<5	N 1 D 8	12.5%	N 0 D 12	0.0%	N 1 D 30	3.3%	N 1 D 93	1.1%	N 3 D 143	2.1%
	Chemoradiotherapy	<5	N 0 D 2	0.0%	N 0 D 6	0.0%	N 1 D 10	10.0%	N 0 D 26	0.0%	N 1 D 44	2.3%
	Adjuvant Chemotherapy	<5	Centralised reports will be available from ChemoCare in due course.									
	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 6 D 156	3.8%	n/a	
	Radical Radiotherapy	<5	N 1 D 8	12.5%	N 0 D 12	0.0%	N 2 D 29	6.9%	N 1 D 93	1.1%	N 4 D 142	2.8%
	Chemoradiotherapy	<5	N 0 D 2	0.0%	N 0 D 6	0.0%	N 2 D 10	20.0%	N 1 D 26	3.8%	N 3 D 44	6.8%
QPI 14 SABR for Inoperable Lung Cancer with Stage I Disease		35	N 4 D 10	40.0%	N 4 D 6	66.7%	N 9 D 36	25.0%	N 47 D 110	42.7%	N 64 D 162	39.5%
QPI 15 Cytological / Histological Diagnosis Prior to Definitive Treatment	i. Surgery	75	N 5 D 10	50.0%	N 12 D 15	80.0%	N 18 D 28	64.3%	N 60 D 93	64.5%	N 95 D 146	65.1%
	ii. Radical Radiotherapy	75	N 2 D 8	25.0%	N 7 D 11	63.6%	N 14 D 29	48.3%	N 45 D 93	48.4%	N 68 D 141	48.2%
QPI 16 Contrast CT/MRI for N2 Patients Prior to Definitive Treatment		95	N 4 D 4	100%	N 5 D 6	83.3%	N 7 D 7	100%	N 31 D 32	96.9%	N 47 D 49	95.9%

QPI Attainment Summary 2021	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 staging 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 2022.

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