SCAN
South East Scotland Cancer Network

NHS SCOTLAND

Working regionally to improve cancer services

SOUTH EAST SCOTLAND CANCER NETWORK
PROSPECTIVE CANCER AUDIT

Lung Cancer 2020
QPI Comparative Audit Report

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Document History

Version	Circulation	Date	Comments
Version 1	Lead Clinicians	04/11/2021	Draft results and outliers circulated.
Version 1.1	Lead Clinician & Regional Audit/Sign Off Sub-Group	10/11/2021	To clarify Actions and provide and/or agree outstanding clinical commentary
Version 2	To Lead Clinician	01/02/2022	Lead Clinician to supply “Chair Summary”.
Version 3	To SCAN Lung Group.	16/02/2022	To SCAN Lung Group for final comment, to be returned by Monday 28th February 2022.
Final SCAN Report Index SA L0122	SCAN Lung Group SCAN Governance Framework SCAN Action Plan Board Leads	09/03/2022	Any potentially disclosive data to be removed prior to publication on SCAN Website.
Version 4W	Report published to SCAN Website	2022	

Chair Summary

SCAN Lung Cancer 2020
Quality Performance Indicators (QPI) Comparative Report
Comment by Chair of the SCAN Lung Group

2020 was a year like no other. This had a great impact on all of us but particularly concerning us was the effect it had on lung cancer patients and services. Many patients were very frightened of hospitals and risks of catching Covid-19, particularly at the start of the pandemic in 2020. We were hugely supported in trying to keep as much going as was humanly possible and audit of what was happening in real time became a reality, in large part due to an extraordinary effort from the audit staff detailed here. This QPI report is one of many reports looking at the effect of Covid-19 on lung cancer and needs to be seen in the context of that.

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 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. I am very grateful to Dr Pheely, ST 6 in medical oncology, for undertaking a detailed audit of the SCLC patient pathway and comparing those who got SACT to those who did not in Lothian in 2018. This showed no obvious delay in the non SACT treatment group, rather a very frail group of patients at even first suspicion of cancer. To give the best possible chance of treatment a ‘SCLC’ alert system has been implemented in October 2020 to tighten this pathway further.

QPIs are always a work in progress and the second round of lung cancer QPI reviews led to 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 document. These new QPIs acknowledge new treatment options e.g. immunotherapy.

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
February 2022

Clinical Action Plan 2020

2020 Action Plan

QPI	Action required	Person Responsible	Date for update
QPI 1	Continued education around respiratory advice to acute medical services (A&E, MoE, GenMed, etc) that *all* patients with suspected lung cancer to be referred to and discussed at MDM.	All clinical staff	Ongoing
QPI 17	Clinical Trials: continuation – SCAN clinicians to ensure that they register trials with SCRN. SCRN should share their lists of current open trials between the Networks to allow the possibility of cross network trial access. NRCN funding of oncology clinicians undertaken in 2018 to improve access to clinician-driven realistic trials.	All clinical staff	Ongoing process

2019 Action Plan

QPI	Action required	Person Responsible	Date for update
QPI 1	Continued education for MoE, Gen Med and Respiratory Junior Doctors that *all* lung cancer patients must be brought to MDM for registration. Replicate NHS-B and NHS-DG protocol of any CT report with suspicion of lung cancer must be sent directly to the respiratory team.	Fife: Dr Iain Murray Lothian: Dr John McCafferty (RIE), Dr Phil Reid (WGH) & Dr Fiona O'Brien (SJH)	Ongoing Achieved
QPI 2 (i)	Herder score to be documented at MDM and recorded by Audit (free text) and used to identify a particular group of outliers i.e. Stg I surgical pts: biopsy difficult due to position or size.	Borders: Dr Hosni El Taweel D&G: Dr Musa Ali Fife: Dr Iain Murray Lothian: Dr John McCafferty (RIE), Dr Phil Reid (WGH) & Dr Fiona O'Brien (SJH)	Herder documentation: ongoing

QPI	Action required	Person Responsible	Date for update
QPI 15 (i)	Herder score to be documented at MDM and recorded by Audit as above for QPI 2(i). MDMs should document reasons why no attempt to biopsy. Audit to document (free text) to aid quick identification of reasons for QPI outliers.	As per QPI 2 (i)	Herder reporting: ongoing Achieved.
QPI 17	**Clinical Trials:** continuation – SCAN clinicians to ensure that they register trials with SCRN. SCRN should share their lists of current open trials between the Networks[1] to allow the possibility of cross network trial access. NRCN funding of oncology clinicians undertaken in 2018 to improve access to clinician-driven realistic trials. To include data from Biobank studies and screening pilots Existing trials to be documented and an updated Paper submitted to SCAN Lung Group meetings.	All clinical staff Dr Melanie Mackean Ailsa Patrizio (Audit)	Ongoing process Achieved & summaries of trials open also shared with NCA & WoSCAN

[1] There are 3 cancer networks in Scotland. **SCAN**: South East Scotland Cancer Network; **NCA**: North Cancer Alliance; & **WoSCAN**: West of Scotland Cancer Network.

Lung Cancer QPI Attainment Summary 2020			Target %	Borders		D&G		Fife		Lothian		SCAN	
QPI 1 MDT discussion prior to definitive treatment			95	N 85 D 85	100%	N 131 D 136	96.3%	N 299 D 299	100%	N 686 D 719	95.4%	N 1201 D 1239	96.9%
QPI 2 Pathological Diagnosis	All patients with lung cancer		80	N 51 D 64	79.7%	N 64 D 105	61.0%	N 130 D 168	77.4%	N 374 D 479	78.1%	N 619 D 818	75.7%
	NSCLC with sub-type identified		90	N 40 D 44	90.9%	N 53 D 54	98.1%	N 120 D 130	92.3%	N 343 D 372	92.2%	N 556 D 600	92.7%
	NSCLC IIIB-IV: PDL1 testing		80	N 28 D 35	80.0%	N 40 D 41	97.6%	N 83 D 94	88.3%	N 207 D 241	85.9%	N 358 D 411	87.1%
*QPI 6 Surgical resection in NSCLC patients		All NSCLC	20	N 9 D 44	20.5%	N 14 D 54	25.9%	N 34 D 123	27.6%	N 89 D 372	23.9%	N 146 D 593	24.6%
		NSCLC stage I-II	60	N 9 D 9	100%	N 9 D 10	90.0%	N 22 D 28	78.6%	N 82 D 106	77.4%	N 122 D 153	79.7%
*QPI 7 Lymph node assessment for NSCLC patients having pneumonectomy or lobectomy			80	Analysis is by Hospital of Surgery: RIE								N 111 D 135	82.2%
QPI 8 Radiotherapy (including SABR) for inoperable lung cancer			35	N 5 D 13	38.5%	N 6 D 16	37.5%	N 23 D 61	37.7%	N 95 D 173	54.9%	N 129 D 263	49.0%
QPI 9 Chemoradiotherapy for locally advanced NSCLC			50	N 0 D 1	0.0%	N 0 D 1	0.0%	N 4 D 6	66.7%	N 11 D 15	73.3%	N 15 D 23	65.2%
QPI 10 Chemoradiotherapy for limited stage SCLC			70	N 0 D 0	n/a	N 0 D 0	n/a	N 2 D 2	100%	N 0 D 1	0.0%	N 2 D 3	66.7%
QPI 12 SACT for patients with SCLC	All types of chemotherapy for SCLC		70	N 10 D 12	83.3%	N 9 D 10	90.0%	N 13 D 20	65.0%	N 22 D 48	45.8%	N 54 D 90	60.0%
	Palliative chemotherapy for SCLC patients having treatment with non-curative intent		50	N 9 D 11	81.8%	N 5 D 6	83.3%	N 8 D 15	53.3%	N 19 D 43	44.2%	N 41 D 75	54.7%
*QPI 13.1 30 Day Mortality After Treatment	*Surgery		<5	Analysis is by Hospital of Surgery: RIE								N 1 D 172	0.6%
	Radical Radiotherapy		<5	N 0 D 5	0.0%	N 0 D 9	0.0%	N 0 D 25	0.0%	N 0 D 82	0.0%	N 0 D 121	0.0%
	Adjuvant Chemotherapy		<5	N 0 D 1	0.0%	N 0 D 0	n/a	N 0 D 6	0.0%	N 0 D 11	0.0%	N 0 D 18	0.0%

Lung Cancer QPI Attainment Summary 2020		Target %	Borders	D&G	Fife	Lothian	SCAN
QPI 13.1 30 Day (cont)	Chemoradiotherapy	<5	N 0 D 4 0.0%	N 1 D 8 12.5%	N 0 D 9 0.0%	N 1 D 26 3.8%	N 2 D 47 4.3%
	Palliative Chemotherapy (NSCLC)	<10	Centralised reports will be available from ChemoCare in due course.				
	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 2 D 172 1.2%
	Radical Radiotherapy	<5	N 0 D 5 0.0%	N 0 D 8 0.0%	N 0 D 25 0.0%	N 1 D 82 1.2%	N 1 D 121 0.8%
	Chemoradiotherapy	<5	N 0 D 4 0.0%	N 1 D 8 12.5%	N 0 D 9 0.0%	N 2 D 26 7.7%	N 3 D 47 6.4%
QPI 14 SABR for Inoperable Lung Cancer with Stage I Disease		35	N 3 D 7 42.9%	N 4 D 9 44.4%	N 8 D 22 36.4%	N 39 D 96 40.6%	N 54 D 134 40.3%
QPI 15 Cytological/Histological Diagnosis Prior to Definitive Treatment	Surgery	75	N 10 D 10 100%	N 9 D 15 60.0%	N 21 D 34 61.8%	N 66 D 96 68.8%	N 106 D 155 68.4%
	Radical Radiotherapy	75	N 3 D 5 60.0%	N 6 D 9 66.7%	N 10 D 25 40.0%	N 32 D 82 39%	N 51 D 121 42.1%
QPI 16 Contrast CT/MRI for N2 Pts Prior to Definitive Treatment		95	N 1 D 1 100%	N 5 D 5 100%	N 8 D 9 88.9%	N 21 D 26 80.8%	N 35 D 41 85.4%
Clinical Trials N=patients consented to trials/research and held on SCRN database. D= 5year average from Cancer Registry		15	N 2 D 105 1.9%	N 0 D 154 0.0%	N 2 D 361 0.6%	N 100 D 755 13.2%	N 104 D 1375 7.6%

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 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 *not applicable*.

Lung Cancer QPI Attainment Summary 2020	Target %	Borders	D&G	Fife	Lothian	SCAN

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.

See appendix 2 for historical Lung Cancer QPI Attainment Summary 2019.

Introduction and Methods

Cohort

This report presents analyses of data collected on patients who are newly diagnosed with lung cancer between 1st January and 31st December 2020 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 except for surgical outcomes where they have been presented by hospital of surgery.

Datasets and 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[2]. Accompanying datasets and measurability criteria for QPIs are published on the PHS (previously ISD) website[3]. 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 (implemented at Year 5: 2017); and FR2 after years 5, 6 & 7. FR2 developments were unfortunately disrupted by the COVID pandemic and consequently QPI reporting post FR2 was implemented partly in year 8 with completion in year 9. QPIs with new data items and/or codes have been deferred to 2021 reporting whereas QPIs 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 FR 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:** PS 3 and PS 4 have become exclusions.	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

[2] QPI documents are available at www.healthcareimprovementscotland.org
[3] 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 form** 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[4]) 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.	

[4] TKI: Tyrosine Kinase Inhibitors attack cancer cells to prevent them from growing and dividing.

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

Patients are mainly identified through registration at weekly multi-disciplinary meetings (MDMs) also referred to as MDT (multi-disciplinary team), 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 the SCAN region or Scotland respectively. Collecting complete audit data for these patients remains a challenge.

The process remains 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 and 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 Hosni El Taweel	Leanne Robinson
NHS Dumfries & Galloway	Dumfries & Galloway Royal Infirmary (DRI)	Dr Musa Ali	Christy Bell Jenny Bruce
NHS Fife	Queen Margaret Hospital (QMH) Victoria Hospital (VHK)	Dr Iain Murray	Mimi Bjelogrlic
NHS Lothian	Royal Infirmary of Edinburgh (RIE) Western General Hospital (WGH) St John's Hospital (SJH)	Post vacant	Ailsa Patrizio
SCAN & NHS Lothian	Edinburgh Cancer Centre (ECC)	Dr Colin Barrie	

Key Categories
Reporting on specific QPIs drives improvement in patients' pathways and outcomes but this should not be the sole benchmark for measuring patient care and nor should it be viewed in isolation. Key categories facilitate the measurement of data not specifically included in the QPI process. The SCAN Lung Group agreed an approach which takes into consideration a selection of *key categories* which are analysed and mainly reported in appendix 1. Some instances also appear throughout the report.

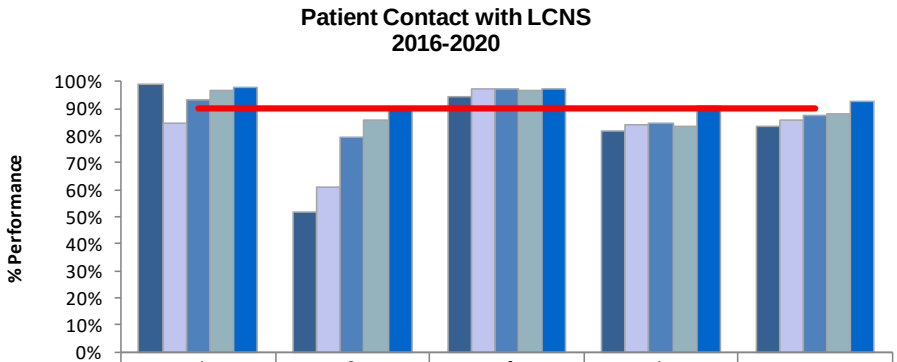
Key categories are vital to endorse standards of care and drive improvements, for example: performance status (PS), viewed in conjunction with staging, are key parameters for the selection of optimal management. High data completeness rates for staging and PS ensure fuller and more accurate analyses. There is not a Scottish standard but if we align with

National Lung Cancer Audit (NLCA)[5] data completeness targets for staging and PS are recommended as being at least 95% of cases. Data completeness results by health board in 2019 - 2020 are as follows:

Health Board	Stage		PS	
	2019	2020	2019	2020
Borders	100%	97.6%	94.1%	98.8%
D&G	100%	90.4%	78.2%	69.9%
Fife	100%	93.3%	99.4%	98.3%
Lothian	98.9%	93.6%	92.3%	92.6%

In the absence of a QPI to measure Clinical Nurse Specialist (CNS) performance, reference is made to the NLCA Report and to National Institute for Health and Care Excellence (NICE) guidelines (England & Wales) which recommend that *every patient with suspected or confirmed lung cancer should have access to a lung cancer clinical nurse specialist*[6]. The Scottish Cancer Plan, the Lung Cancer Forum for Nurses (LCFN), NLCA and NICE all agree that 90% of patients should have access to a lung cancer CNS at diagnosis and throughout their pathway. The Roy Castle Lung Cancer Foundation view the role of the lung cancer CNS as *crucial in the provision of optimal patient care; providing support from initial presentation, through investigations to diagnosis, to treatment and thereafter*[7].

Results by health board between 2016 and 2020 are shown below and set against the recommended target of 90%:



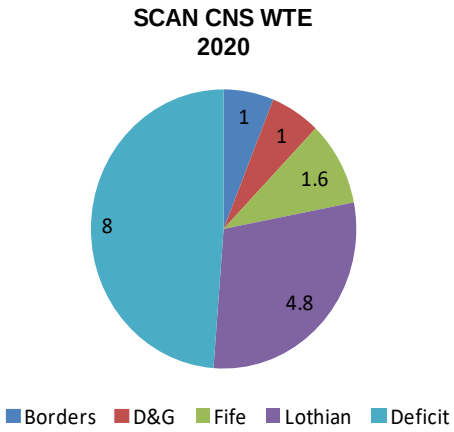
	Borders	D&G	Fife	Lothian	SCAN
2016	98.8%	51.7%	94.7%	81.8%	83.5%
2017	84.9%	60.8%	97.3%	84.3%	85.6%
2018	93.0%	79.5%	97.1%	84.8%	87.7%
2019	96.5%	85.7%	96.7%	83.7%	88.3%
2020	97.6%	89.7%	97.3%	91.0%	92.8%
Target	90%	90%	90%	90%	90%

[5] 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.

[6] NICE (2012, updated 2019): *Lung Cancer in Adults, Quality Standard [QS 17]* https://www.nice.org.uk/guidance/qs17/chapter/Quality-statement-3-Lung-cancer-clinical-nurse-specialist

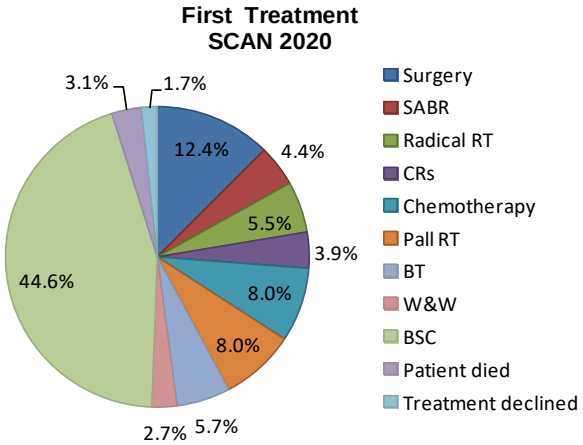
[7] The Roy Castle Lung Cancer Foundation & National Lung Cancer Forum for Nurses (January 2013) *Understanding the Value of Lung Cancer Nurse Specialists.*

92.8% of lung cancer patients in SCAN saw a CNS in 2020. CNS provision in SCAN for circa 1250 patients is 8.4 WTE[8] (equivalent to one nurse for every 150 new patients) The NLCA Report 2018 quotes the national commissioning guidance recommendation, *that there should be the equivalent of 1 whole-time-equivalent specialist nurse for every 80 patients*[9]. This equates to an ideal of 16.4 WTE for SCAN region (and demonstrated in the pie opposite), which in reality falls short and results in a deficit of 8 WTE nurses.



NHS Fife are in the process of recruiting an additional CNS, anticipated to be in post early 2022. This will raise Fife's WTE to 2.2 and consequently, SCAN will have a deficit of 7.4 WTE at that time.

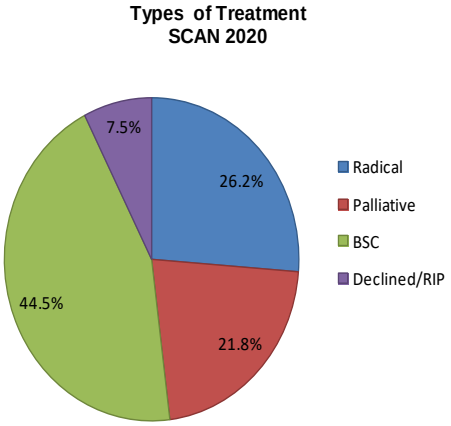
Summary of all patients and first treatments in SCAN



Treatments by stage are included in Appendix 1: Key Categories.

The chart opposite illustrates first treatment rates. It clearly shows that, sadly in SCAN, for just fewer than 45% of patients, the commonest experience of lung cancer is that they are too unwell for any active interventions (Best Supportive Care (BSC)).

This gives a clear message that more needs to be done to detect lung cancer early ((DCE): a Scottish Government Campaign[10]) which includes the undertaking of a targeted lung cancer screening pilot due to start in 2021 in NHS Lothian.



- Radical treatment includes surgery, radical radiotherapy and chemoradiotherapy.

- Palliative treatment includes palliative radiotherapy, and palliative SACT which covers palliative chemotherapy, targeted therapy, immunotherapy and chemoimmunotherapy.

[8] WTE: Whole Time Equivalent.
[9] NLCA 2018 Report: https://nlca.azurewebsites.net/AnnualReport
[10] Information regarding the DCE Scottish Government Campaign can be found at https://www.isdscotland.org/Health-Topics/Cancer/Detect-Cancer-Early/

Data Quality

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.

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

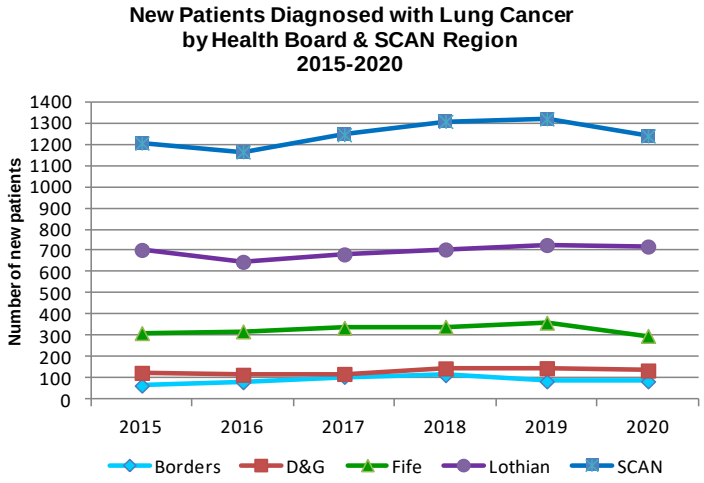
High levels of case ascertainment provide confidence in the completeness of audit recording and contribute to the reliability of results presented. Cases that have been diagnosed in the private sector but received any part of their treatment in NHS hospitals are included.

In the most recent period (1st January to 31st December 2020) 1239 patients were diagnosed with lung cancer (ICD-codes: C33, C34) in the SCAN region.

Number of patients recorded in audit:

Patients diagnosed 01/01/2020 to 31/12/2020

	Borders	D&G	Fife	Lothian	SCAN
Number of cases in audit cohort	85	136	299	719	1239



Estimate of case ascertainment is calculated using the average of the most recent available 5 years of Cancer Registry data (2015-2019) and measured against the most recent year (2020) in audit.

	Borders	D&G	Fife	Lothian	SCAN
Number of cases from audit	85	136	299	719	1239
Cases from Cancer Registry (2015-2019)	105	154	361	755	1375
Estimated Case Ascertainment 2020	**81.0%**	**88.3%**	**82.8%**	**95.2%**	**90.1%**

Source: Scottish Cancer Registry, PHS. Data extracted from ACaDMe: 07/12/2020

Despite a drop in urgent suspicion of lung cancer referrals by GPs early in the Covid pandemic, the number of expected lung cancer cases (i.e. the estimated case ascertainment

achieved) identified in 2020 was still high, particularly for NHS Lothian (95.2%). Historical case ascertainment results by HB are as follows:

Estimate of case ascertainment: performance by Health Board 2015 - 2019.

	Borders	D&G	Fife	Lothian	SCAN
2019	80.2%	94.8%	102.0%	95.3%	95.8%
2018	114.4%	99.3%	99.1%	91.7%	96.0%
2017	112.8%	83.9%	98.8%	89.3%	92.8%
2016	88.0%	75.8%	96.1%	87.7%	88.8%
2015	65.0%	88.0%	94.3%	90.1%	88.8%

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 Quality Performance Indicators (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:

SCAN Health Boards	Percentage accuracy
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 10th November 2021, at which point clinical recommendations were agreed.
- The final draft, complete with agreed amendments from the Sign-off meeting on 10th November 2021, was circulated to the SCAN Lung Group on 16th February 2022 for final comment.
- The Final report was circulated to Clinical Governance Groups and SCAN Action Plan Board Leads on 11/03/2022.
- 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, nurses, and audit staff) 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' team, 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 7.

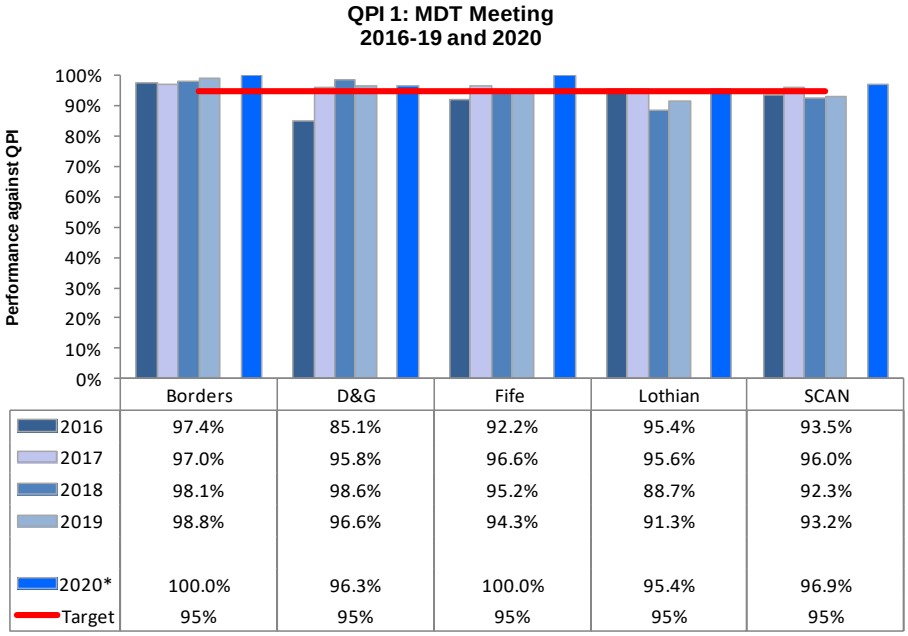
Quality Performance Indicators
Diagnosis and Staging Investigations

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
2020 cohort	85	136	299	719	1239
Ineligible for this QPI	0	0	0	0	0
Numerator	85	131	299	686	1201
Not recorded for numerator	0	0	0	0	0
Denominator	85	136	299	719	1239
Not recorded for exclusions	0	0	0	0	0
Not recorded for denominator	0	0	0	0	0
% Performance	**100.0%**	**96.3%**	**100.0%**	**95.4%**	**96.9%**

Comments
The QPI was met by all health boards in 2020 and no action is required.



	Borders	D&G	Fife	Lothian	SCAN
2016	97.4%	85.1%	92.2%	95.4%	93.5%
2017	97.0%	95.8%	96.6%	95.6%	96.0%
2018	98.1%	98.6%	95.2%	88.7%	92.3%
2019	98.8%	96.6%	94.3%	91.3%	93.2%
2020*	100.0%	96.3%	100.0%	95.4%	96.9%
Target	95%	95%	95%	95%	95%

*The target remains at 95% but numerator criteria have changed. Change was implemented in 2020.
CAVEAT: Comparison of 2016-19 results with 2020 does not afford definitive comparison.

Formal Review Cycle 2 Revision
Numerator: *prior to definitive treatment* has been removed and this indicator now measures explicitly whether or not patients have been discussed at MDM.

Prior to 2020 outliers were identified as 2 distinct categories: 1) those who were not discussed and 2) patients given emergency treatment prior to MDM. At FR2 it was decided that patients who, correctly, have emergency treatment e.g. radiotherapy for spinal cord compression, should no longer be considered as outliers, i.e. not meeting this QPI. The stipulation *prior to treatment* was removed from numerator criteria. It is essential that patients are discussed at MDM, regardless of whether or not they have had any urgent treatment prior to this. Delaying urgent treatment until after MDM discussion does not represent best practice for emergency conditions such as spinal cord compression, compromised airways and other urgent medical conditions which could otherwise be detrimental to patient outcome. Patients undergoing urgent treatment are, appropriately, not included in the numerator going forward.

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 PS 3 or 4.

Target 80%	Borders	D&G	Fife	Lothian	SCAN
2020 cohort	85	136	299	719	1239
Ineligible for this QPI	21	31	131	291	472
Numerator	51	64	130	374	619
Not recorded for numerator	0	0	0	0	0
Denominator	64	105	168	475	812
Not recorded for exclusions*	1	39	3	50	93
Not recorded for denominator	0	0	0	0	0
% Performance	**79.7%**	**61.0%**	**77.4%**	**78.7%**	**76.2%**
* NR for Exclusions: PS not recorded	**1**	**39**	**3**	**50**	**93**
Outliers with PS not recorded	1	27	3	28	59

Comments

This QPI has consistently been a struggle across Scotland since its inception. It has been subject to several reviews and audits; with amendments ranging from revisions of performance target to varying exclusions but it continues to be challenging and somewhat controversial. Analyses show there exist a group of patients who cannot undergo invasive investigations due to poor fitness levels and/or comorbidities and sadly 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 to view this QPI; so that we do not strive to attain targets which might drive clinically inappropriate or potentially unsafe outcomes for patients; which arguably are redundant when pathology would not influence or alter clinical management or patient outcomes.

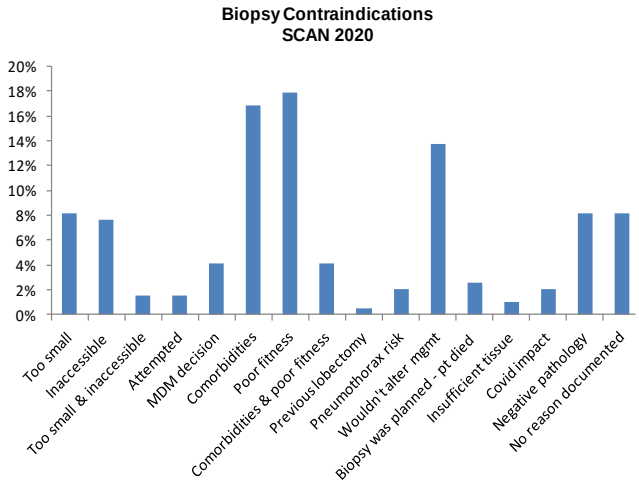
QPI 2 (i) has come under further scrutiny in the most recent QPI review (FR2). Frozen sections prior to definitive surgery are now included as pre-treatment pathology; and, PS 3 & 4 have been excluded, which now aligns Scottish measurements of pathological confirmation rates with those of NHS England, Wales and Northern Ireland, all of which do not include patients with poor fitness levels, i.e. PS 3-4, in pre-treatment pathological analyses. Indeed, the performance levels across SCAN are now narrowly missing the target in 3 of the 4 SCAN health boards. Results compare favourably to the NHS England rate of 72% of patients with pathological confirmation rate for patients of PS 0-2[11].

The target was not met SCAN-wide: NHS Borders experienced a shortfall of 0.3% (13 cases); D&G a shortfall of 19% (41 cases); Fife's saw 2.6% (38 cases); while NHS Lothian had a shortfall of 1.9% (104 cases). Valid clinical reasons were provided for the majority of patients who did not have a pathological diagnosis, although a total of 16 patients (Fife 7, Lothian 9) were noted to have 'reason not documented'.

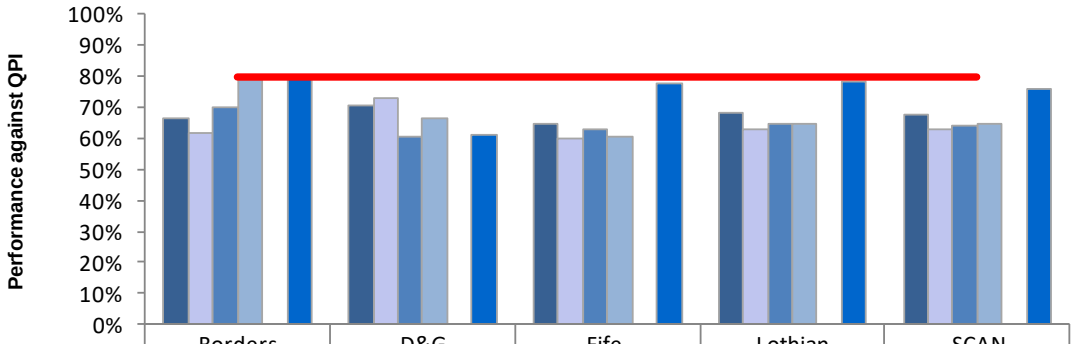
[11] Bain L et al, 2020: *Lung Cancer Patients Without Tissue Diagnosis in NHS Lothian 2016 – 2018*, p2

QPI 2 (i) Biopsy Contraindications

	Borders	D&G	Fife	Lothian
Too small	0	1	0	15
Inaccessible	1	3	1	10
Too small/inaccessible	0	0	0	3
Attempted	0	1	0	2
MDM decision	0	2	0	6
Comorbidities	0	10	12	11
Poor fitness	9	8	5	13
Comorbs &poor fitness	0	0	0	8
Previous lobectomy	0	0	0	1
Pneumothorax risk	0	1	0	3
Suspected carcinoid	0	0	0	0
Wouldn't alter mgmt	0	8	8	11
Patient deceased	0	0	3	2
Insufficient tissue	2	0	0	0
Covid impact	0	0	0	4
Negative pathology	1	7	2	6
No reason documented	0	0	7	9
	13	**41**	**38**	**104**



QPI 2 (i): Pathological Diagnosis of Lung Cancer 2016-2019 and 2020



	Borders	D&G	Fife	Lothian	SCAN
2016	66.7%	70.4%	64.8%	68.4%	67.4%
2017	61.5%	72.6%	59.8%	62.7%	62.7%
2018	69.8%	60.6%	62.9%	64.6%	64.1%
2019	78.8%	66.2%	60.4%	64.8%	64.6%
2020*	79.7%	61.0%	77.4%	78.1%	75.9%
Target	80%	80%	80%	80%	80%

*The target remains at 90% but numerator criteria have changed. Change was implemented in 2020.
CAVEAT: Comparison of 2016-19 results with 2020 does not afford definitive comparison.

Formal Review Cycle 2 Revision
Numerator: Positive frozen sections are to be included as pre-treatment pathological diagnoses.
Exclusions: Patients with PS 3 or 4 are now excluded from QPI 2 (i).

Performance Status of 'Not Recorded' (PS = NR) is a Surrogate for Poor Outcomes:

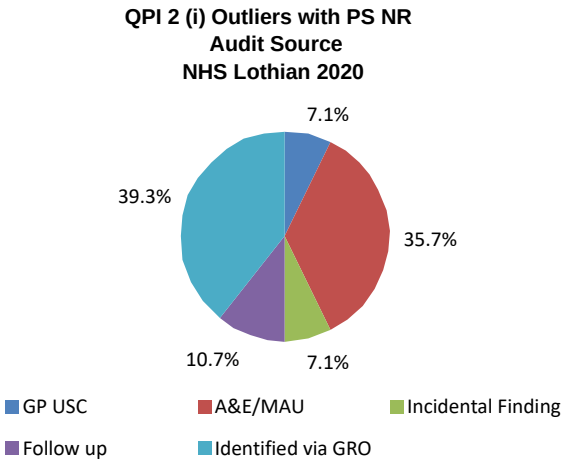
The consequences of 'incomplete' and 'not recorded' data (not recorded for exclusion) are worthy of further analyses.

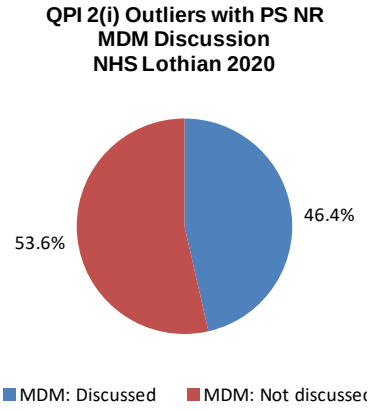
In QPI 2 (i) a total of 93 patients, with 'PS NR' met denominator criteria. Of these, 59 were identified as outliers, i.e. no pathological diagnosis. (Borders: 1 patient, D&G: 27, Fife: 8 and Lothian: 28). Many of these patients are elderly, are admitted via A&E and likely have poor fitness, comorbidities and advanced disease. It would be plausible to identify these patients as equivalent to PS 3 or 4 which would mean exclusion from QPI 2 (i). The denominators would reduce and targets would be met (excepting NHS Fife) as shown below:

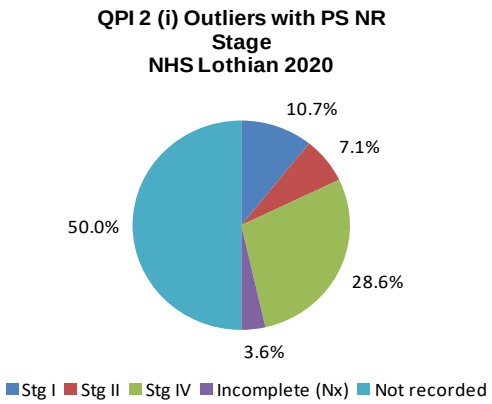
2020 cohort: exclude PS NR from Den.	Borders	D&G	Fife	Lothian	SCAN
Numerator	51	64	130	374	619
Denominator	63	78	165	447	753
% Performance	**81.0%**	**82.1%**	**78.8%**	**83.0%**	**81.8%**

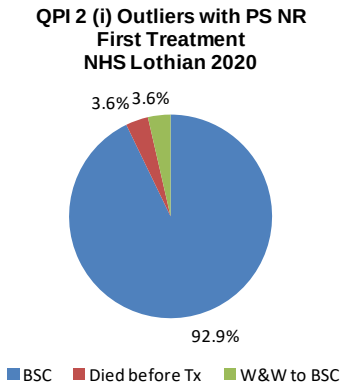
The above analysis is based on supposition but highlights the necessity for complete as opposed to incomplete data, including performance status (fitness) record. A mini audit of NHS Lothian outliers with PS 'not recorded' has been carried out (and indeed confirms the above supposition). Results are as shown and discussed below.

Audit of QPI 2 (i) Outliers with Performance Status 'not recorded'









Almost 40% of patients with PS not recorded were identified for audit via GRO[12] (and mainly found to present through A&E, although not discussed at MDM) followed by almost 36% presenting to A&E or referred to MAU. If the GRO identified patients are added to this group, then A&E presentation accounts for 75% of the cohort. Over half were not discussed at MDM; stage was not reported for 50% and over a quarter presented with advanced stage disease. BSC was the treatment choice for almost all patients in the PS NR cohort. Results suggest it would not be unreasonable to categorise patients with PS NR as PS3/4, i.e. ineligible for this QPI.

In conclusion, unrecorded or incomplete data can be challenging and can distort results. While it should not matter how a patient comes into secondary care it is crucial that staging and performance status are complete and that patients are discussed and all aspects documented at MDM to ensure equity of care. Ensuring that patients are discussed at MDM will continue as an action point within the Action Plan for 2020.

Outcomes for patients with performance status 3 and 4

An action identified at FR2 was that the measurability document should facilitate the reporting of PS 3 & 4 patients alongside specification 2 (i) so that this could be included within regional annual reports. The group agreed on the importance of looking at the number and percentage of PS 3 & 4 patients even though these were to be excluded from this QPI. The ability to make comparisons between health boards and regions in a separate analysis was seen as key to monitoring any variation. The percent performance reported below is not subject to QPI targets and is for information purposes only.

Numerator = Number of patients with lung cancer who have a pathological diagnosis.
Denominator = All patients with lung cancer who are PS3 and PS4.
Exclusions = Patients who decline investigations or surgical resection.

QPI 2 (i) PERFORMANCE STATUS 3 & 4	Borders	D&G	Fife	Lothian	SCAN
2020 cohort	85	136	299	719	1239
Numerator	6	3	158	12	179
Denominator	17	24	289	54	384
% Performance	**35.3%**	**12.5%**	**54.7%**	**22.2%**	**46.6%**

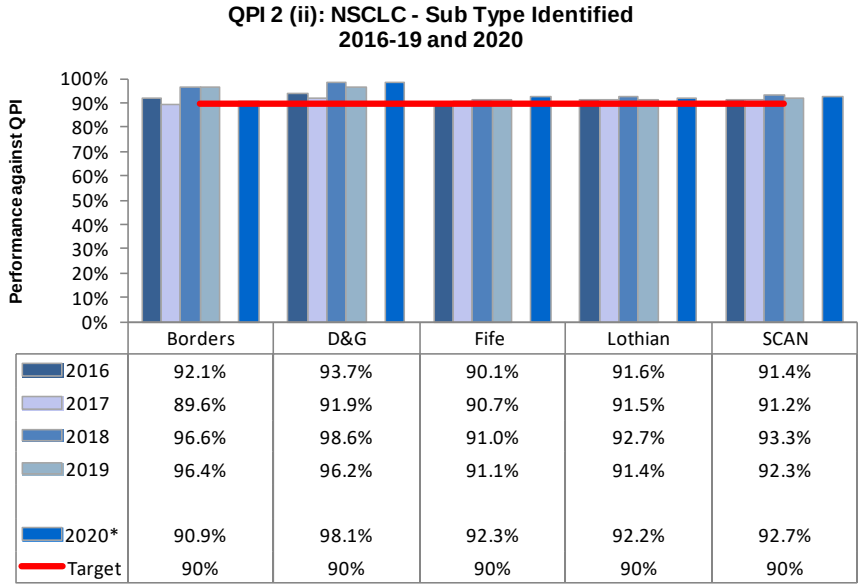
[12] General Registry Office data (births, marriages & deaths)

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[13]) 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
2020 cohort	85	136	299	719	1239
Ineligible for this QPI	41	82	169	347	639
Numerator	40	53	120	343	556
Not recorded for numerator	0	0	0	0	0
Denominator	44	54	130	372	600
Not recorded for exclusions	0	0	0	0	0
Not recorded for denominator	0	0	0	0	0
% Performance	**90.9%**	**98.1%**	**92.3%**	**92.2%**	**92.7%**

Comment
The QPI was met by all health boards in 2020 and no action is required.



	Borders	D&G	Fife	Lothian	SCAN
2016	92.1%	93.7%	90.1%	91.6%	91.4%
2017	89.6%	91.9%	90.7%	91.5%	91.2%
2018	96.6%	98.6%	91.0%	92.7%	93.3%
2019	96.4%	96.2%	91.1%	91.4%	92.3%
2020*	90.9%	98.1%	92.3%	92.2%	92.7%
Target	90%	90%	90%	90%	90%

*The target remains at 90% but numerator criteria have changed. Change was implemented in 2020.
CAVEAT: Comparison of 2016-19 results with 2020 does not afford definitive comparison.

Formal Review Cycle 2 Revision
Numerator: criterion has been extended to include code 31: combination of non small cell components (e.g. Adenosquamous).

QPI 2 (iii) Non-Squamous, Stage IIIB to IV: Molecular Profiling Analyses
FR 2: Staging was amended and a new data item [PROFILE] introduced. This QPI will be reported in 2021.

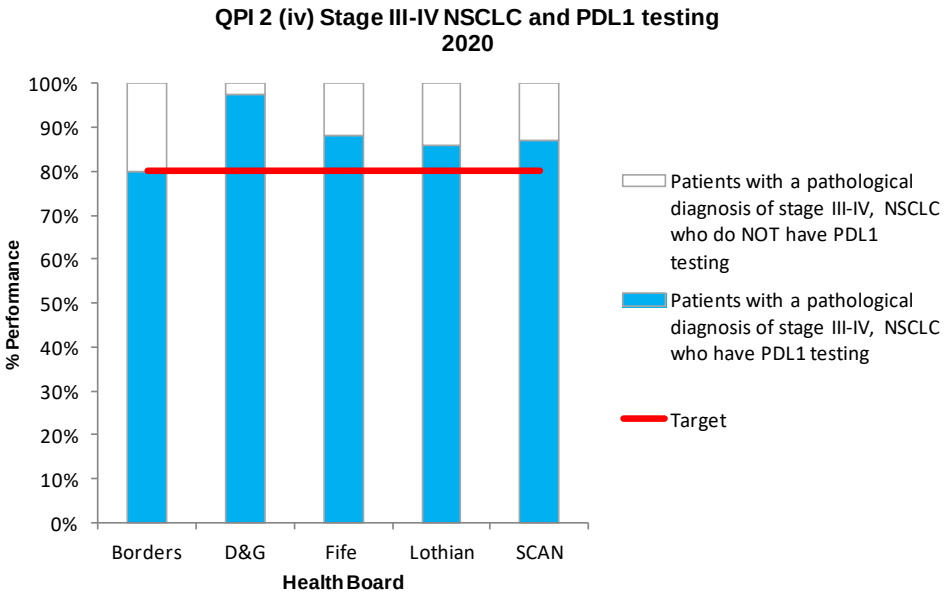
[13] NSCLC = Squamous, Adenocarcinoma, NSCLC (Not Otherwise Specified, (NOS)) and Other Specific NSCLC. *QPI Measurability Document, Version 3.4*: ISD Scotland: March 2019
[14] NSCLC sub types = Squamous, Adenocarcinoma, Other Specific NSCLC as specified in *Lung Cancer Measurability of Quality Performance Indicators, Version 3.4*: ISD Scotland: March 2019.

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 PS 4.

Target 80%	Borders	D&G	Fife	Lothian	SCAN
2020 cohort	85	136	299	719	1239
Ineligible for this QPI	50	95	205	478	828
Numerator	28	40	83	207	358
Not recorded for numerator	0	0	0	0	0
Denominator	35	41	94	241	411
*Not recorded for exclusions	0	4	0	11	15
**Not recorded for denominator	0	2	5	2	9
% Performance	**80.0%**	**97.6%**	**88.3%**	**85.9%**	**87.1%**
* NR for Exclusion: PS not recorded	0	4	0	11	15
** NR for Denominator: TNM not recorded	0	2	5	2	9

Comment
This QPI was met by all health boards and no action is required.



Formal Review Cycle 2: New QPI
Introduced to measure PD-L1 testing in patients with a pathological diagnosis of stage III-IV NSCLC. New data items were not required. This is the first year of reporting and no comparable data is available

QPI 4 PET CT in patients being treated with curative intent
FR2: Amended to include timing element & new data items [PETREQDATE] & [PETREPORTDATE]. To be reported in 2021.

QPI 5 Patients with nodal spread on PET CT should undergo nodal sampling
FR2: Archived at Baseline Review. To be reinstated in amended form. To be reported in 2021.

Treatment Management

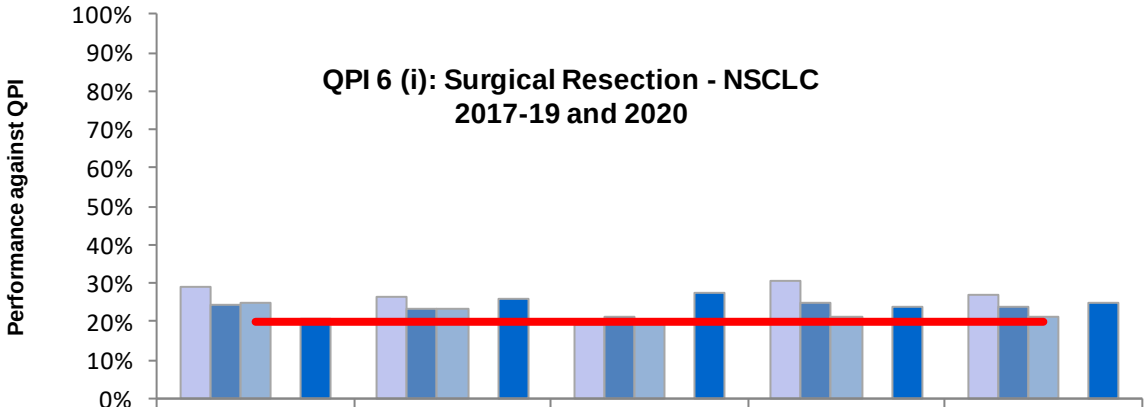
QPI 6 Surgical Resection in Non-Small Cell Lung Cancer
6 (i) NSCLC and Surgical Resection **Target = 20%**

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
2020 cohort	85	136	299	719	1239
Ineligible for this QPI	41	82	176	347	646
Numerator	9	14	34	89	146
Not recorded for numerator	0	0	0	0	0
Denominator	44	54	123	372	593
Not recorded for exclusions	0	0	0	0	0
Not recorded for denominator	0	0	0	0	0
% Performance	**20.5%**	**25.9%**	**27.6%**	**23.9%**	**24.6%**

Comments
The QPI was met by all SCAN health boards in 2020. This reflects good patient selection for primary surgery and no action is required**.**

Lung cancer surgery includes pneumonectomy, lobectomy, segmentectomy, and wedge resection. Wedge procedures are kept to a minimum. Any patients referred for surgical resection who 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.



	Borders	D&G	Fife	Lothian	SCAN
2017	29.2%	26.2%	19.2%	30.5%	27.2%
2018	24.1%	23.5%	21.3%	24.8%	23.7%
2019	25.0%	23.1%	19.0%	21.4%	21.3%
2020*	20.5%	25.9%	27.6%	23.9%	24.6%
Target	20%	20%	20%	20%	20%

*The target remains at 20% but exclusion criteria have changed. Change was implemented in 2020.
CAVEAT: Comparison of 2017-19 results with 2020 does not afford definitive comparison.

Formal Review Cycle 2 Revision
Exclusion*: patients who decline surgery* and *patients undergoing SABR* have been excluded. Implemented and reported in 2020.

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

Numerator = Number of patients with NSCLC, Stage I-II[15] who undergo surgical resection.
Denominator = All patients with NSCLC, Stage I-II only.
Exclusion = Patients who die before surgery.

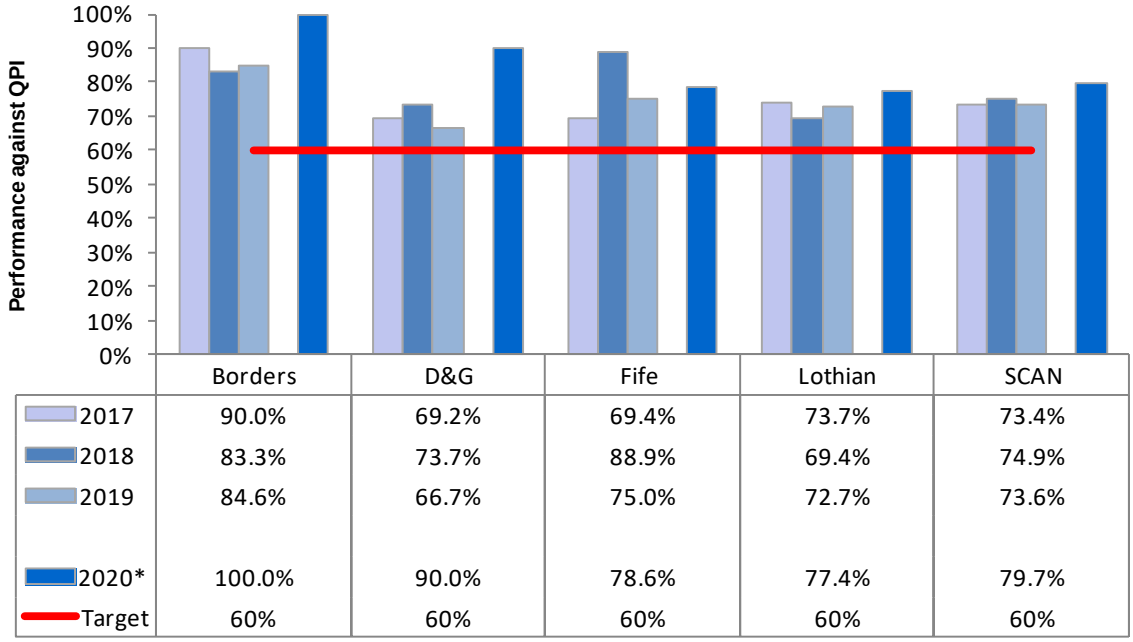
Target 60%	Borders	D&G	Fife	Lothian	SCAN
2020 cohort	85	136	299	719	1239
Ineligible for this QPI	76	126	271	611	1077
Numerator	9	9	22	82	122
Not recorded for numerator	0	0	0	0	0
Denominator	9	10	28	106	153
Not recorded for exclusions	0	0	0	0	0
**Not recorded for denominator	0	2	5	2	9
% Performance	**100.0%**	**90.0%**	**78.6%**	**77.4%**	**79.7%**

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

Comments

The QPI was met by all SCAN health boards in 2020. This again reflects good patient selection for primary surgery and no action is required**.**

QPI 6 (ii): Surgical Resection - NSCLC Stages I-II 2017-19 and 2020



	Borders	D&G	Fife	Lothian	SCAN
2017	90.0%	69.2%	69.4%	73.7%	73.4%
2018	83.3%	73.7%	88.9%	69.4%	74.9%
2019	84.6%	66.7%	75.0%	72.7%	73.6%
2020*	100.0%	90.0%	78.6%	77.4%	79.7%
Target	60%	60%	60%	60%	60%

*The target remains at 60% but exclusion criteria have changed. Change was implemented in 2020.
CAVEAT: Comparison of 2017-19 results with 2020 does not afford definitive comparison.

Formal Review Cycle 2 Revision
Exclusion*: patients who decline surgery* and *patients undergoing SABR* have been excluded.
Implemented and reported in 2020.

[15] 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%**

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).

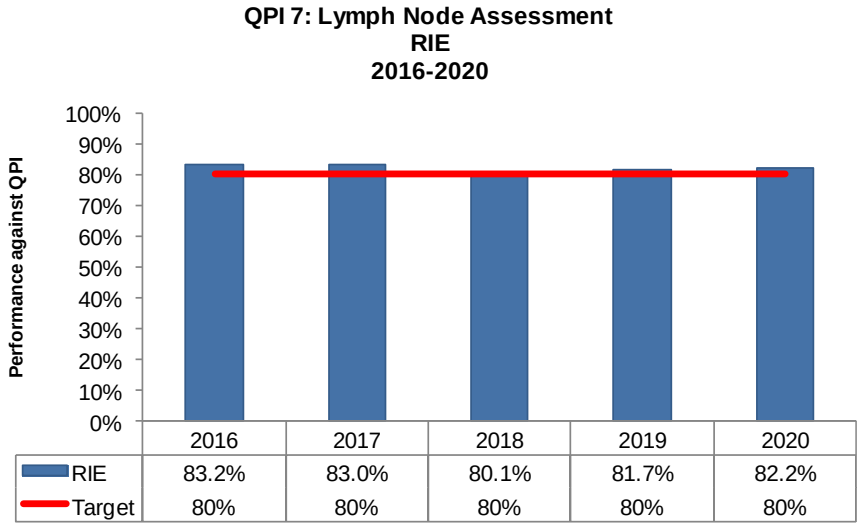
Royal Infirmary of Edinburgh (RIE)

Target 80%	2017	2018	2019	2020
Numerator	137	121	107	111
Not recorded for numerator	0	14	0	0
Denominator*	165	151	131	135
Not recorded for exclusions	0	0	0	0
Not recorded for denominator	0	0	0	0
% Performance	**83.0%**	**80.1%**	**81.7%**	**82.2%**

* The denominator includes 32 (2017); 43 (2018); 24 (2019); and 15 (2020) patients who were diagnosed in NHS Tayside and had surgery at RIE. 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
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.

The target has been consistently met in the 4 years previous and again in 2020. No action is required.



Formal Review Cycle 2
No changes to numerator, denominator or exclusions. All data above are comparable.

QPI 8 Radiotherapy for Inoperable Lung Cancer **Target = 35%**

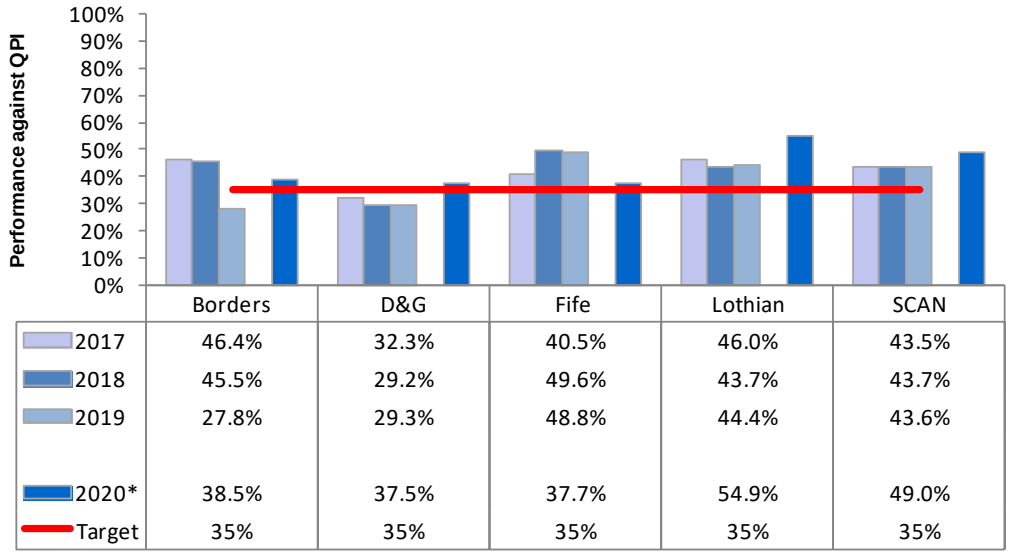
Numerator = Number of patients with stages I-IIIA lung cancer not undergoing surgery who receive radical radiotherapy[16] +/- chemotherapy, or SABR.
Denominator = All patients with stages I-IIIA lung cancer not undergoing surgery.
Exclusions = Patients with SCLC, patients who decline radiotherapy, or who die prior to treatment.

Target 35%	Borders	D&G	Fife	Lothian	SCAN
2020 cohort	85	136	299	719	1239
Ineligible for this QPI	72	120	238	512	934
Numerator	5	6	23	95	129
Not recorded for numerator	0	0	0	0	0
Denominator	13	16	61	173	263
Not recorded for exclusions	0	0	0	0	0
Not recorded for denominator**	0	0	8	34	42
% Performance	**38.5%**	**37.5%**	**37.7%**	**54.9%**	**49.0%**

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

Comments
The QPI was met by all SCAN health boards in 2020 and no action is required.

QPI 8: Radical Radiotherapy ± Chemotherapy or SABR
2017-19 and 2020



	Borders	D&G	Fife	Lothian	SCAN
2017	46.4%	32.3%	40.5%	46.0%	43.5%
2018	45.5%	29.2%	49.6%	43.7%	43.7%
2019	27.8%	29.3%	48.8%	44.4%	43.6%
2020*	38.5%	37.5%	37.7%	54.9%	49.0%
Target	35%	35%	35%	35%	35%

*The target remains at 35% but denominator and exclusion criteria have changed. Change was implemented in 2020.
CAVEAT: Comparison of 2017-19 results with 2020 does not afford definitive comparison.

Formal Review Cycle 2
Denominator: Now specifies stage as I-IIIA.
Exclusion: Stage is now specified; consequently stage IV is no longer necessary under exclusions.

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

QPI 9 Chemoradiotherapy: Locally Advanced NSCLC **Target = 50%**

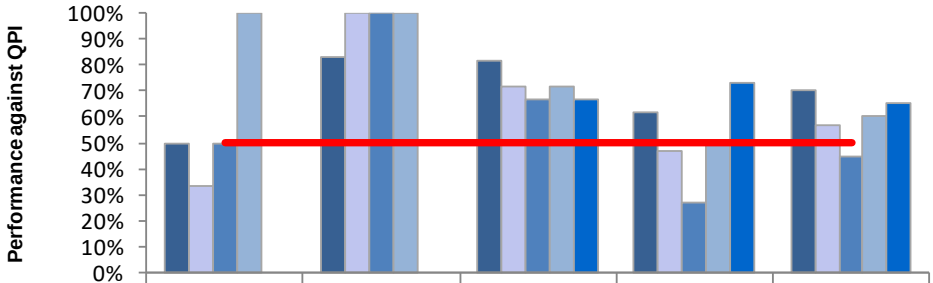
Numerator = Number of patients with NSCLC, Stage IIIA[17] and PS 0-1, not undergoing surgery and who receive Chemoradiotherapy[18].
Denominator = All patients with NSCLC, Stage IIIA and PS 0-1 not undergoing surgery who receive radical radiotherapy[19].
Exclusions = Patients who decline chemotherapy, patients who die before treatment, patients who receive Continuous Hyperfractionated Radiotherapy (CHART).

Target 50%	Borders	D&G	Fife	Lothian	SCAN
2020 cohort	85	136	299	716	1236
Ineligible for this QPI	84	135	293	701	1213
Numerator	0	0	4	11	15
Not recorded for numerator	0	0	0	0	0
Denominator	1	1	6	15	23
Not recorded for exclusions	0	0	0	0	0
Not recorded for denominator	0	0	0	0	0
% Performance	**0.0%**	**0.0%**	**66.7%**	**73.3%**	**65.2%**

Comments
The QPI was met by NHS Fife & NHS Lothian in 2020.

NHS Borders and NHS D&G: did not meet their targets and, in each of these health boards, there was only 1 patient in the denominator: 1 patient in Borders was not fit enough to undergo the chemotherapy component while the patient diagnosed in D&G had comorbidities which precluded chemoradiotherapy. These patients have been shown to be unable to have chemoradiotherapy owing to valid clinical reasons. Additionally, when reviewing results, allowance should be made where numbers are small and variation may be due to chance. No action is required.

QPI 9 Chemoradiotherapy: NSCLC Stage IIIA 2016-2020



	Borders	D&G	Fife	Lothian	SCAN
2016	50.0%	83.3%	81.8%	61.9%	70.0%
2017	33.3%	100.0%	71.4%	47.1%	56.7%
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%
Target	50%	50%	50%	50%	50%

Formal Review Cycle 2
No changes to numerator, denominator or exclusions. All data above are comparable.

[17] Stage IIIA NSCLC includes: T1a-c N2 M0; T1b N2; T2a-b N2M0; T3 N1 M0; T4 N0-1 M0.
[18] NSCLC Chemoradiotherapy: radiotherapy ≥ 54Gy and concurrent or sequential chemotherapy.
[19] 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[20] and PS 0-1 who receive chemoradiotherapy[21].
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
2020 cohort	85	136	299	719	1239
Ineligible for this QPI	85	136	297	718	1232
Numerator	0	0	2	0	2
Not recorded for numerator	0	0	0	0	0
Denominator	0	0	2	1	3
Not recorded for exclusions	0	0	0	0	0
Not recorded for denominator**	0	0	0	4	4
% Performance	**n/a**	**n/a**	**100.0%**	**0.0%**	**66.7%**

** Not recorded for denominator are those patients where TNM stage and/or PS were not recorded.

Not Recorded

NR for Den: TNM not recorded	0	0	0	2	2
NR for Den: TNM & PS not recorded	0	0	0	2	2
Total				**4**	**4**

Comments

This QPI was met by NHS Fife in 2020.

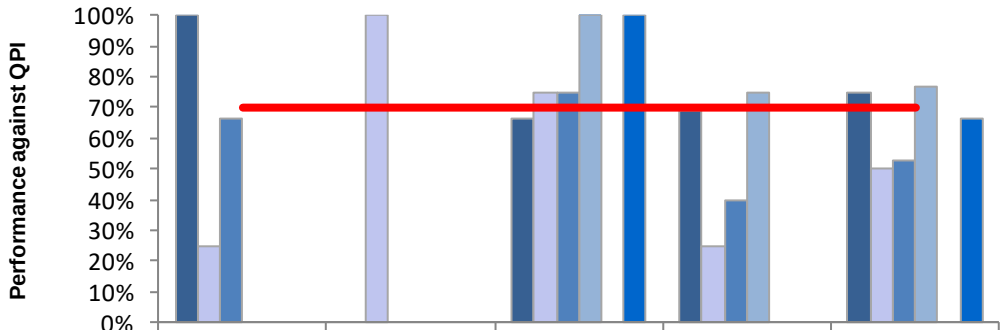
NHS Lothian: There was only 1 patient in the denominator. The radical radiotherapy component was contraindicated due to chemoradiotherapy being given for a previous lung tumour in 2016. This represents a valid clinical reason and no action is required. Treatment management was, instead, by surgical resection.

NHS Borders & NHS D&G: The denominator criteria did not apply to any patients in 2020 cohorts and results should be viewed as not applicable.

The denominator was changed at FR2 from stages I-IIIB to stages I-IIIA SCLC but, this alone cannot be responsible for the very small numbers eligible for analysis. It has been proposed that the SCLC cohort may have been affected by the Covid pandemic; the number of SCLC patients has declined from 92 in 2019 to 61 patients in 2020. Further analyses would be required to confirm if this is the case.

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

QPI 10: Chemoradiotherapy - SCLC Stages I - IIIA
2016-19 and 2020



	Borders	D&G	Fife	Lothian	SCAN
2016	100.0%	0.0%	66.7%	69.2%	75.0%
2017	25.0%	100.0%	75.0%	25.0%	50.0%
2018	66.7%	0.0%	75.0%	40.0%	52.4%
2019	0.0%	0.0%	100.0%	75.0%	76.9%
2020*	0.0%	0.0%	100.0%	0.0%	66.7%
Target	70%	70%	70%	70%	70%

*The target remains at 70% but denominator criteria have changed. Change implemented in 2020.
CAVEAT: Comparison of 2016-19 results with 2020 does not afford definitive comparison.

In D&G in 2018 the target was not met when 0 (out of 1) patient received chemoradiotherapy; similarly (although not directly comparable) in 2020 the result for NHS Lothian was 0 out of 1 patient. Conversely, in 2016 and 2019 the denominator criteria were not met by any of the patients diagnosed in D&G and 0.0% represents “not applicable” in these cases. In 2020 the denominator criteria did not apply to any patients diagnosed in NHS Borders or Dumfries & Galloway. These should also be viewed as “not applicable”.

Formal Review Cycle 2 Revision
Denominator: Now specified as stages I-IIIA; previously I-IIIB.

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

11 (i) Patients with NSCLC who receive SACT

FR2: three new codes have been introduced for specific SACT types; targeted therapy, immunotherapy and chemoimmunotherapy which were previously reported under a single code described as ‘biological therapy’. This will facilitate more comprehensive reporting. To be reported in 2021.

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

FR2: Change to QPI to report solely on patients who receive targeted therapy. A new code has been introduced to enable reporting of targeted therapy. To be reported in 2021.

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

FR2: New QPI introduced to report on patients who receive immunotherapy solely or as part of chemoimmunotherapy. New codes have been introduced to enable reporting. To be reported in 2021.

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[22] ± 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
2020 cohort	85	136	299	719	1239
Ineligible for this QPI	73	126	279	671	1149
Numerator	10	9	13	22	54
Not recorded for numerator	0	0	0	0	0
Denominator	12	10	20	48	90
Not recorded for exclusions	0	0	0	0	0
Not recorded for denominator	0	0	0	0	0
% Performance	**83.3%**	**90.0%**	**65.0%**	**45.8%**	**60.0%**

Comments

The QPI was met by NHS Borders & NHS Dumfries & Galloway in 2020. The target was not met by NHS Fife with a shortfall of 5% (7 cases) or by NHS Lothian with a shortfall of 24.2% (26 cases). Valid clinical reasons were provided for most patients who did not receive chemotherapy.

Chemotherapy Contraindications: NHS Fife	Numbers
Comorbidities, for palliative radiotherapy only	1
Comorbidities, for BSC	1
Poor PS/frailty precludes chemotherapy	4
Deterioration post MDM: opportunity for chemotherapy missed	1
TOTAL	**7**

Chemotherapy Contraindications: NHS Lothian	Numbers	Seen by Oncology
Patient frailty from cancer +/- comorbidities	11	4
Patient died before MDM	1	
Patient frailty from comorbidities	6	2
Patient frailty from comorbidities +/- cancer, received XRT instead	5	5
Patient frail from cancer (paraneoplastic encephalopathy) given XRT	1	1
Patient died rapid progressive disease prior to oncology	2	
TOTAL	**26**	**12**

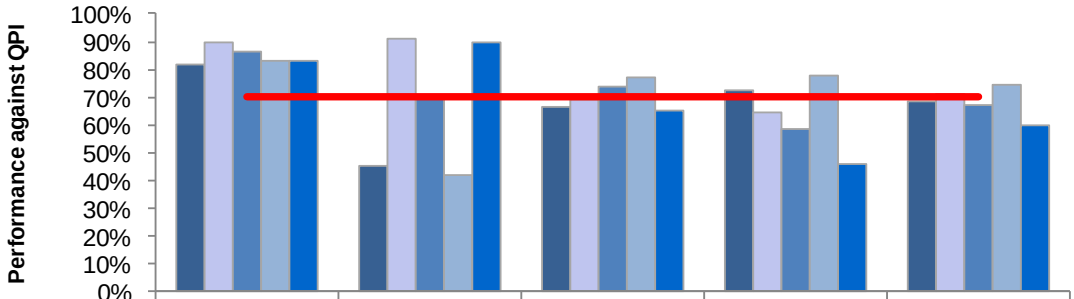
A concern, though, is that some patients deteriorated post MDM yet prior to being seen by oncology. Moreover, there are just over half of these patients who are not seen by oncology at all. SCLC has a propensity to show considerable growth in a very short period and, opportunities for treatment can unfortunately be missed. An audit was carried out by Dr Ashley Pheely (ST6, Medical Oncology Registrar) to study the pathway for SCLC from suspicion of cancer to treatment and to assess the failure of QPI 12 in 2018 in NHS Lothian. A paper was presented at the SCAN Lung Group meeting, 18th November 2020 by Dr Pheely who concluded:

The high number of patients diagnosed with SCLC who did not receive chemotherapy in Lothian in 2018 reflects the rapidity in which this disease causes relentless deterioration in an already frail patient group as opposed to concerns with a protracted patient pathway[23].

[22] Chemotherapy includes neoadjuvant, adjuvant, chemoradiotherapy or palliative chemotherapy.
[23] Extract from *Understanding the pathway for patients diagnosed with small cell lung cancer who did not receive chemotherapy in 2018 Lothian* – see Appendix 3 for complete audit and findings.

Consequent to this audit, an 'SCLC Alert' was set up in NHS Lothian in 2020 to alert oncology clinicians to all new diagnoses of small cell lung cancer independent of MDM to enable pre-booking of urgent new patient slots in oncology for these patients. This will be reviewed in 2021 data.

QPI 12 (i) Chemotherapy ± Radiotherapy: SCLC 2016-2020



	Borders	D&G	Fife	Lothian	SCAN
2016	81.8%	45.5%	66.7%	72.3%	68.7%
2017	90.0%	90.9%	69.2%	64.4%	70.8%
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%	45.8%	60.0%
Target	70%	70%	70%	70%	70%

Formal Review Cycle 2 Revision
No changes to numerator, denominator or exclusions. All data are comparable.

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

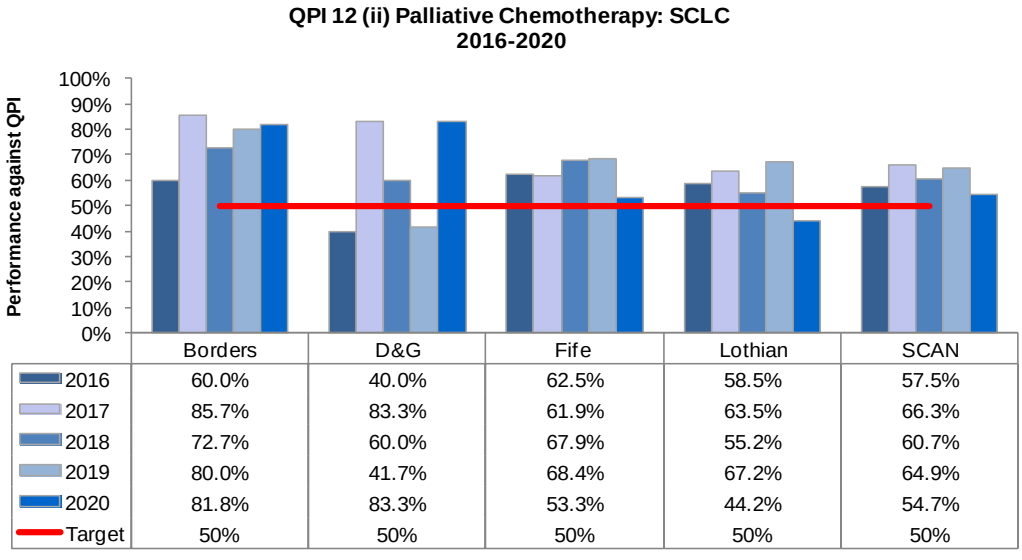
Numerator = Number of patients with SCLC not undergoing treatment with curative intent who receive palliative chemotherapy.
Denominator = All patients with SCLC not undergoing treatment with curative intent.
Exclusions = Patients who decline chemotherapy, patients who die before treatment and patients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

Target 50%	Borders	D&G	Fife	Lothian	SCAN
2020 cohort	85	136	299	719	1239
Ineligible for this QPI	74	130	291	676	1171
Numerator	9	5	8	19	41
Not recorded for numerator	0	0	0	0	0
Denominator	11	6	15	43	75
Not recorded for exclusions	0	0	0	0	0
Not recorded for denominator	0	0	0	0	0
% Performance	**81.8%**	**83.3%**	**53.3%**	**44.2%**	**54.7%**

Comments

The target was not met by NHS Lothian with a shortfall of 5.8% (24 cases). Valid clinical reasons were provided for most patients who did not receive chemotherapy. This QPI, similarly, links in with the audit of SCLC patients diagnosed in 2018 and included above under QPI 12 (i).

Chemotherapy Contraindications: NHS Lothian	Numbers	Seen by Oncology
Patient frailty from cancer +/- comorbidities	10	4
Patient died before MDM	1	
Patient frailty from comorbidities	6	2
Patient frailty from comorbidities +/- cancer, received XRT instead	4	4
Patient frail from cancer (paraneoplastic encephalopathy) given XRT	1	1
Patient died rapid progressive disease prior to oncology	2	
TOTAL	**24**	**11**



	Borders	D&G	Fife	Lothian	SCAN
2016	60.0%	40.0%	62.5%	58.5%	57.5%
2017	85.7%	83.3%	61.9%	63.5%	66.3%
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%	44.2%	54.7%
Target	50%	50%	50%	50%	50%

Formal Review Cycle 2 Revision
No changes to numerator, denominator or exclusions. All data are comparable.

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

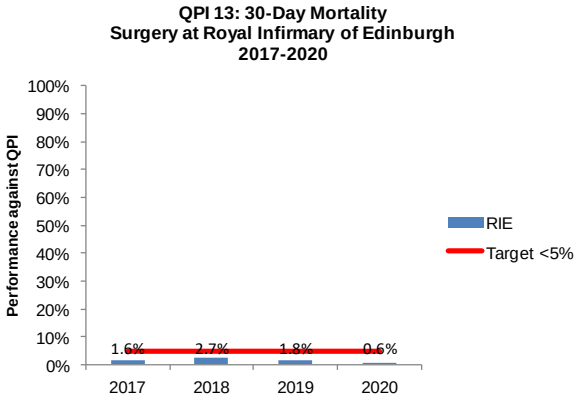
All patients who die within 30 and 90 days of treatment completion are discussed and reported at regularly held Mortality and Morbidity (M&M) meetings. It is standard QPI practice to report reasons only for outliers but for completeness, and in line with M&M protocols, reasons are given here for *all* 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.

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%	2017	2018	2019	2020
Numerator	3	5	3	1
NR for numerator	0	0	0	0
Denominator*	192	188	166	172
NR for exclusions	0	0	0	0
NR for denominator	0	0	0	0
% Performance	**1.6%**	**2.7%**	**1.8%**	**0.6%**

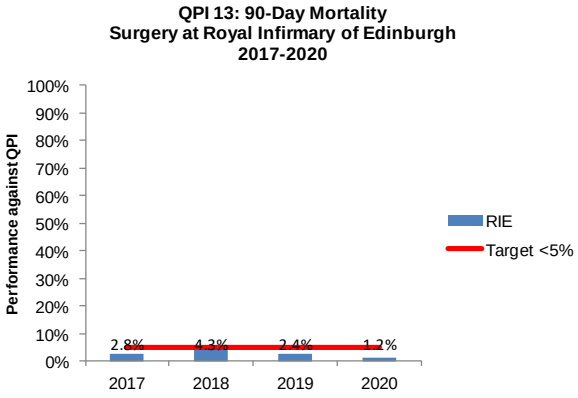


13 (i) B: Surgery: 90-Day Mortality **Target <5%**

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%	2017	2018	2019	2020
Numerator	5	8	4	2
NR for numerator	0	0	0	0
Denominator*	192	187	164	172
NR for exclusions	0	0	0	0
NR for denominator	0	0	0	0
% Performance	**2.6%**	**4.3%**	**2.4%**	**1.2%**



* 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.

Comments

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

There were 2 deaths which occurred within 90 days of surgery, 1 of whom died within 30-days post-surgery. Results remain within the accepted target parameters and in line with good clinical practice. The reasons are detailed below:

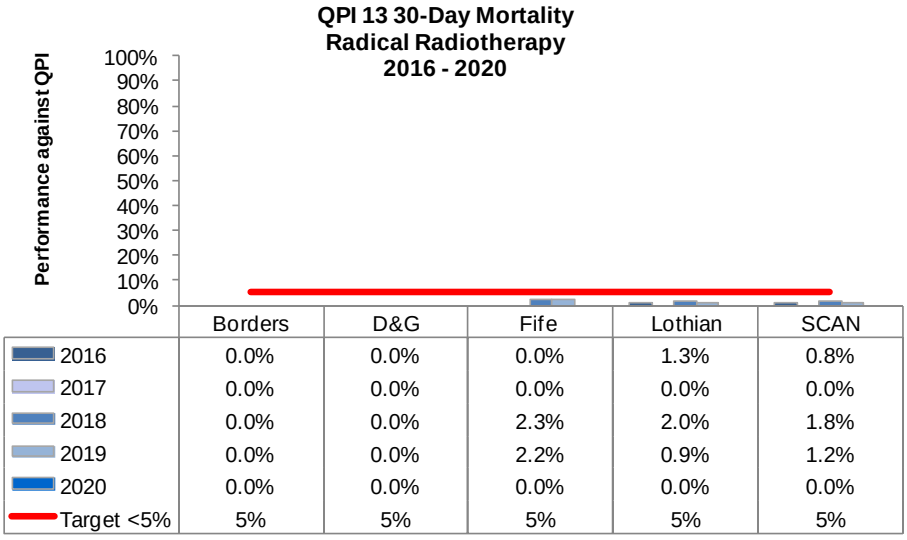
1 patient died from gastrointestinal complications and 1 from respiratory complications.

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

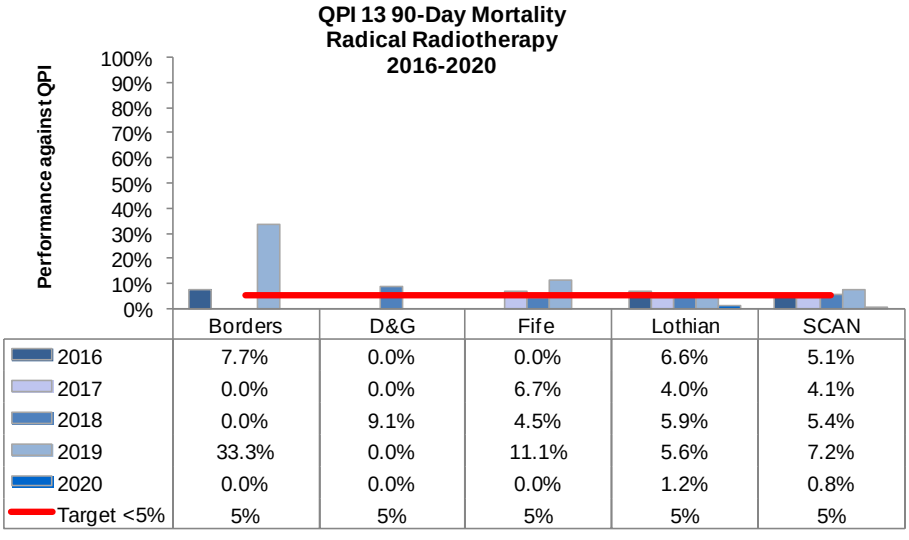
Numerator = Number of patients who receive radical radiotherapy who die within 30 and 90 days of treatment.
Denominator = All patients with lung cancer who receive radical radiotherapy (no exclusions).

Target <5%	Borders		D&G		Fife		Lothian		SCAN	
	30	90	30	90	30	90	30	90	30	90
2020 cohort	85	85	136	136	299	29	719	719	1239	1239
Ineligible for this QPI	80	80	127	128	274	27	637	637	1118	1119
Numerator	0	0	0	0	0	0	0	1	0	1
Not recorded for numerator	0	0	0	0	0	0	0	0	0	0
Denominator	5	5	9	8*	25	25	82	82	121	120
Not recorded for exclusions	0	0	0	0	0	0	0	0	0	0
Not recorded for denominator	0	0	0	0	0	0	0	0	0	0
% Performance	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1.2**	**0.0**	**0.8**

*The denominator in D&G for 30-day mortality is 9 compared to 8 for 90 days. 90 days had not elapsed since treatment for 1 patient who is therefore not included in the 90-day denominator.



	Borders	D&G	Fife	Lothian	SCAN
2016	0.0%	0.0%	0.0%	1.3%	0.8%
2017	0.0%	0.0%	0.0%	0.0%	0.0%
2018	0.0%	0.0%	2.3%	2.0%	1.8%
2019	0.0%	0.0%	2.2%	0.9%	1.2%
2020	0.0%	0.0%	0.0%	0.0%	0.0%
Target <5%	5%	5%	5%	5%	5%



	Borders	D&G	Fife	Lothian	SCAN
2016	7.7%	0.0%	0.0%	6.6%	5.1%
2017	0.0%	0.0%	6.7%	4.0%	4.1%
2018	0.0%	9.1%	4.5%	5.9%	5.4%
2019	33.3%	0.0%	11.1%	5.6%	7.2%
2020	0.0%	0.0%	0.0%	1.2%	0.8%
Target <5%	5%	5%	5%	5%	5%

Comments

There was1 death within 90 days of patients receiving radical radiotherapy in NHS Lothian. The accepted target parameters, however, were not exceeded. There were no deaths following radical radiotherapy within 30- or 90-days in the other 3 SCAN health boards.

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.

NHS Lothian: This indicator remained within accepted parameters. 1 patient died within 90 days post radical radiotherapy.

- Metastatic progression was identified in the context of general decline. Deterioration continued despite treatment for pneumonia and the patient was discharged home for terminal care.

QPI 13 (iii) Adjuvant Chemotherapy: 30-Day Mortality **Target <5%**

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

Target <5%	Borders	D&G	Fife	Lothian	SCAN
2020 cohort	85	136	299	719	1239
Ineligible for this QPI	84	136	293	708	1221
Numerator	0	0	0	0	0
Not recorded for numerator	0	0	0	0	0
Denominator	1	0	6	11	18
Not recorded for exclusions	0	0	0	0	0
Not recorded for denominator	0	0	0	0	0
% Performance	**0.0%**	**n/a**	**0.0%**	**0.0%**	**0.0%**

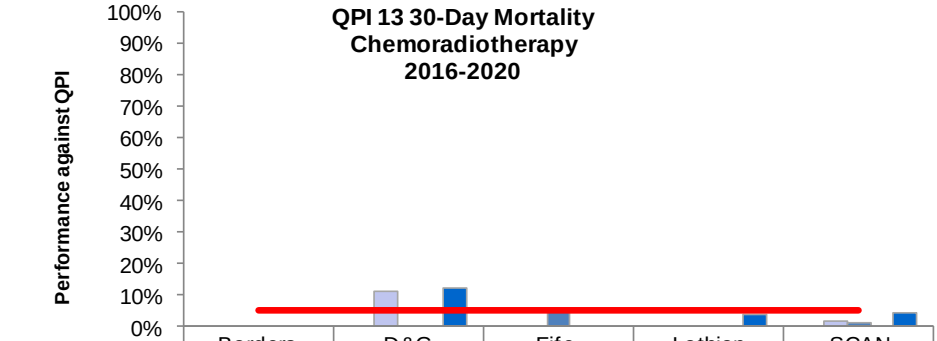
Comments

There were no deaths within 30 days for patients diagnosed with lung cancer in 2020 who received adjuvant chemotherapy in SCAN. This has been the pattern over the past 8 years of QPI reporting and therefore a chart is not deemed necessary. 90-day analysis is not undertaken for adjuvant chemotherapy.

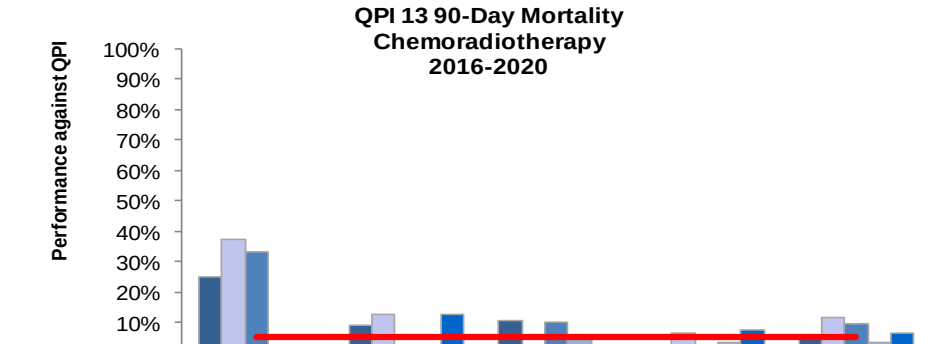
QPI 13 (iv) Chemoradiotherapy: 30-and 90-Day Mortality **Target <5%**

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
2020 cohort	85	85	136	136	299	299	719	719	1239	1239
Ineligible for this QPI	81	81	128	128	290	290	693	693	1192	1192
Numerator	0	0	1	1	0	0	1	2	2	3
Not recorded for numerator	0	0	0	0	0	0	0	0	0	0
Denominator	4	4	8	8	9	9	26	26	47	47
Not recorded for exclusions	0	0	0	0	0	0	0	0	0	0
Not recorded for denominator	0	0	0	0	0	0	0	0	0	0
% Performance	**0.0**	**0.0**	**12.5**	**12.5**	**0.0**	**0.0**	**3.8**	**7.7**	**4.3**	**6.4**



	Borders	D&G	Fife	Lothian	SCAN
2016	0.0%	0.0%	0.0%	0.0%	0.0%
2017	0.0%	11.1%	0.0%	0.0%	1.9%
2018	0.0%	0.0%	4.8%	0.0%	1.5%
2019	0.0%	0.0%	0.0%	0.0%	0.0%
2020	0.0%	12.5%	0.0%	3.8%	4.3%
Target <5%	5%	5%	5%	5%	5%



	Borders	D&G	Fife	Lothian	SCAN
2016	25.0%	9.1%	10.5%	0.0%	5.6%
2017	37.5%	12.5%	0.0%	6.7%	11.4%
2018	33.3%	0.0%	10.0%	0.0%	9.7%
2019	0.0%	0.0%	4.8%	3.5%	3.6%
2020	0.0%	12.5%	0.0%	7.7%	6.4%
Target<5%	5%	5%	5%	5%	5%

Comments
The disproportionately high percentages witnessed in the 90-day mortality analyses for NHS Borders in 2016 (2 out of 8 patients), 2017 (3 out of 8) and 2018 (4 out of 12) must be viewed with a degree of caution due to the impact small numbers can have on overall results.

There were 2 deceased patients within 30 days of completion of chemoradiotherapy; 1 patient was diagnosed in NHS Fife and 1 in NHS Lothian. 1 further patient, who was diagnosed in NHS Lothian, died more than 30 days but within 90 days of treatment completion. Results are within accepted target parameters in NHS Lothian in relation to 30-day analysis although are exceeded relative to 90-days. The patient diagnosed in NHS Fife appears in both 30- and 90-day results.

There were no deaths 30- or 90-days post chemoradiotherapy in either NHS Borders or NHS Fife.

In line with M&M protocols, explanations are given here for *all* patients who die within 30- and/or 90-days of treatment regardless of whether results remain within accepted parameters or if they are exceeded.

1 patient died from cardiac problems associated with comorbidities, 1 died from infection and 1 died from progressive disease.

QPI 13 (v-vii): 30-Day Mortality: Palliative SACT

These QPIs are to be replaced with a standardised 30-day SACT Mortality QPI across all the tumour types covered by the QPI program.

Measurement is being revised to use data from ChemoCare (electronic chemotherapy prescribing system) in order to utilise existing data and provide an accurate picture of all patients with lung cancer undergoing SACT, rather than the subset of all diagnosed in the audit year cohort only.

The development of a national reporting tool is currently underway through a collaboration with Public Health Scotland 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 2020**.**

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

Numerator = Number of patients with Stage I[24] lung cancer not undergoing surgery who receive SABR[25].
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.

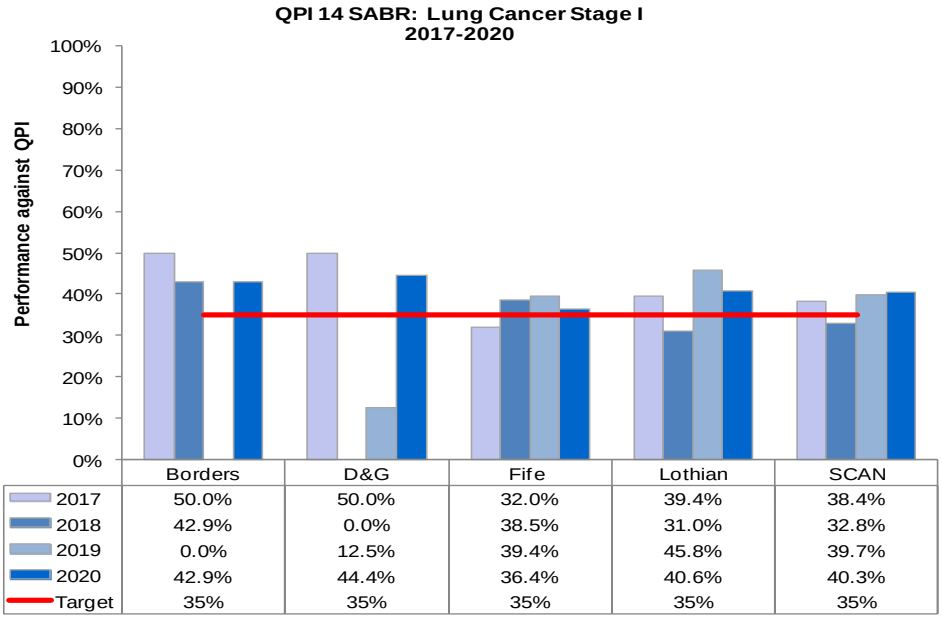
Target 35%	Borders	D&G	Fife	Lothian	SCAN
2020 cohort	85	136	299	719	1239
Ineligible for this QPI	78	127	277	597	1074
Numerator	3	4	8	39	54
Not recorded for numerator	0	0	0	0	0
Denominator	7	9	22	96	134
Not recorded for exclusions	0	0	0	0	0
Not recorded for denominator*	0	1	4	26	31
% Performance	**42.9%**	**44.4%**	**36.4%**	**40.6%**	**40.3%**

*** NR for Denominator: TNM not recorded**		**1**	**4**	**26**	**31**

Comments
The QPI was met by all SCAN health boards in 2020 and no action is required.

As the population ages so the incidence of lung cancer is increasing. Often these 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 mode to these patients.

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



	Borders	D&G	Fife	Lothian	SCAN
2017	50.0%	50.0%	32.0%	39.4%	38.4%
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%
Target	35%	35%	35%	35%	35%

Formal Review Cycle 2 Revision
No changes to numerator, denominator or exclusions. All data are comparable.

This QPI was new to the QPI reporting programme following FR1 and was implemented on 1st January 2017, The Dataset was updated to include a new data field [SABR]; a specialised type of radiotherapy which precisely targets the tumour with radiation whilst lowering the risk of damage to surrounding tissue.

QPI 15 Pre-Treatment Diagnosis

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

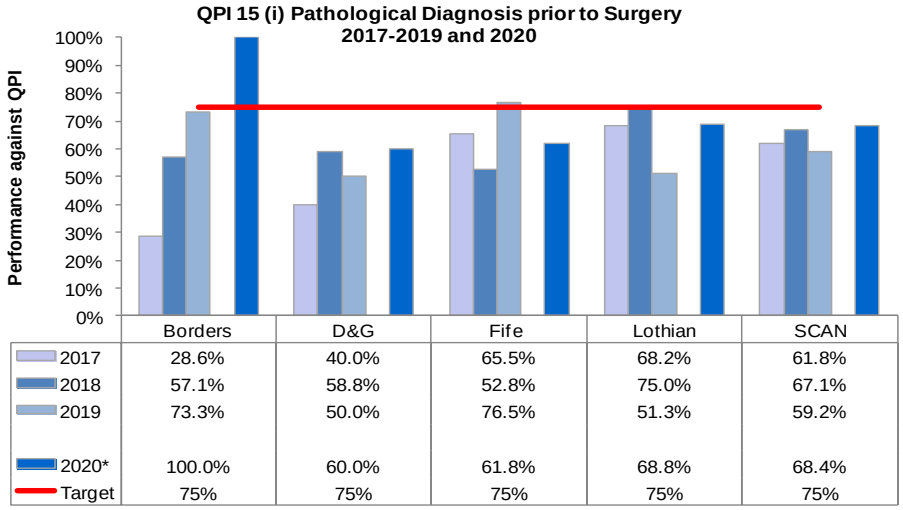
Numerator = Number of patients with lung cancer receiving surgery who have a cytological/histological diagnosis prior to definitive treatment.
Denominator = All patients with lung cancer who receive surgery.
Exclusions = Patients who decline investigations.

Target 75%	Borders	D&G	Fife	Lothian	SCAN
2020 cohort	85	136	299	719	1239
Ineligible for this QPI	75	121	265	623	1084
Numerator	10	9	21	66	106
Not recorded for numerator	0	0	0	0	0
Denominator	10	15	34	96	155
Not recorded for exclusions	0	0	0	0	0
Not recorded for denominator	0	0	0	0	0
% Performance	**100.0%**	**60.0%**	**61.8%**	**68.8%**	**68.4%**

Comments

This QPI was met by NHS Borders in 2020.The target was not met by the other 3 health boards: NHS D&G had a shortfall of 15% (6 cases); NHS Fife of 13.2% (13 cases); and NHS Lothian had 6.2% (30 cases). Valid clinical reasons were provided for the majority of patients with only 4 patients (8.2%) where no reason was documented.

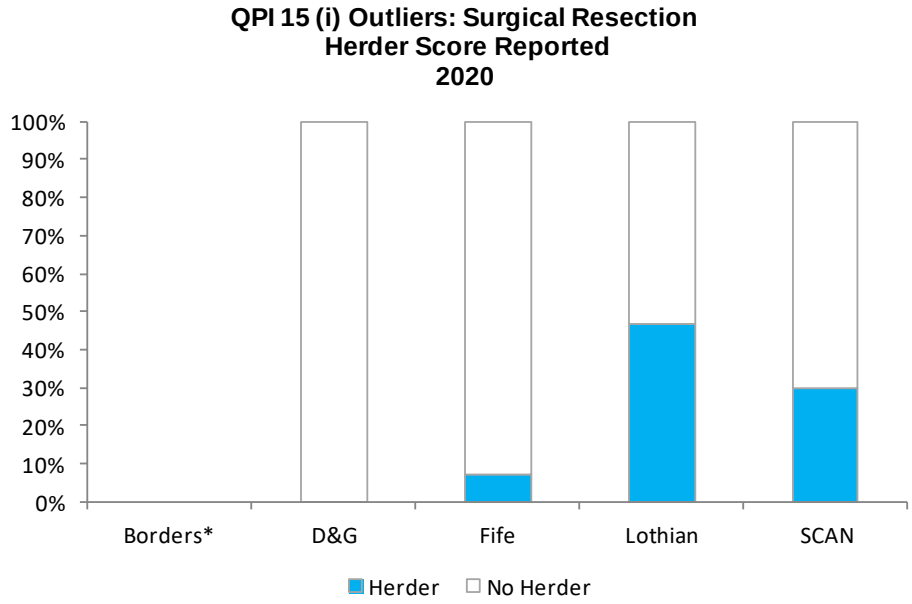
Pathology Investigation Contraindications	**D&G**	**Fife**	**Lothian**
Too small to biopsy	1	3	4
Inaccessible to biopsy	1	4	10
Too small & inaccessible	0	1	5
Attempted biopsy	1	0	1
MDM decision: biopsy too risky	2	0	2
Suspected carcinoid	0	0	1
Negative pathology	1	4	4
No reason documented	0	1	3
TOTAL	**6**	**13**	**30**



*The target remains at 75% but numerator criteria have been amended. Change implemented in 2020.
CAVEAT: Comparison of 2017-19 results with 2020 does not afford definitive comparison.

Formal Review Cycle 2 Revision
Numerator: Treatment is now specified as *definitive*. This facilitates analyses where first treatment is reported as *watch & wait* and definitive treatment is *surgery*.

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 at MDM so that all approaches are considered and that all proper processes take their course. A study by Bain, L et al[26] 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 option. Reporting Herder at MDM has been part of the Action Plan for 3 years (since 2018) but remains challenging as illustrated in the chart below.



* NHS Borders' QPI performance was 100% and, as such, there are no outliers for Borders.

The remaining results are somewhat disappointing, and it appears that Herder score reporting may take some time to be embedded in practice. In D&G, 0 out of 6 patients had a Herder score reported; NHS Fife's result was 2 out of 14; and NHS Lothian achieved 14 out of 30 patients.

ACTION PLAN 2020

- All health boards to record Herder scores at MDM for all patients without pathology who are referred for surgical resection.

[26] 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*.

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.

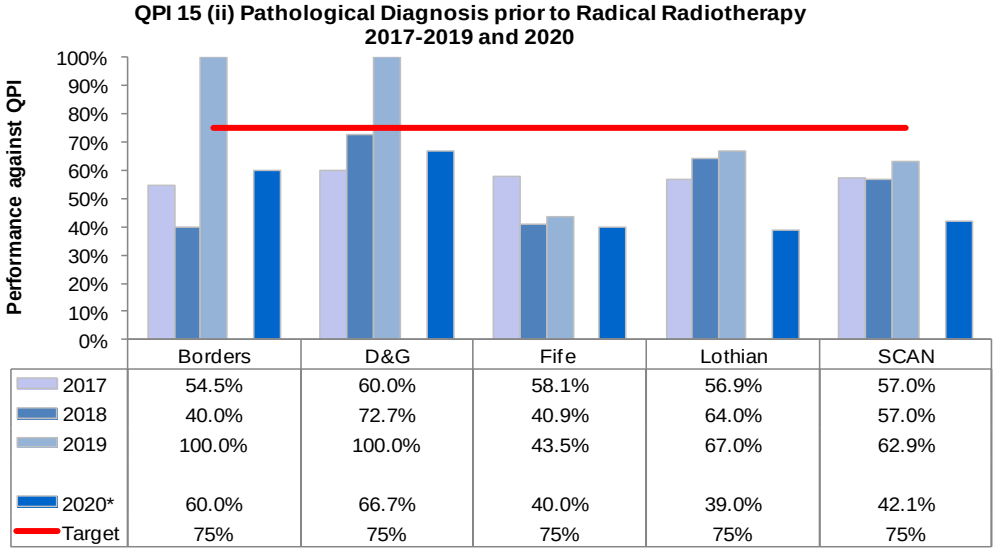
Target 75%	Borders	D&G	Fife	Lothian	SCAN
2020 cohort	85	136	299	719	1239
Ineligible for this QPI	80	127	274	638	1119
Numerator	3	6	10	32	51
Not recorded for numerator	0	0	0	0	0
Denominator	5	9	25	82	121
Not recorded for exclusions	0	0	0	0	0
Not recorded for denominator	0	0	0	0	0
% Performance	**60.0%**	**66.7%**	**40.0%**	**39.0%**	**42.1%**

Comments
Allowances should be made where small numbers and variation may be due to chance. Aggregation of results over time may be useful, in future years, to clarify results where numbers are small. It should be noted that disproportionate percentages can be a consequence of small numbers.

The target was not met across SCAN region in 2020. NHS Borders had a shortfall of 15% (2 cases); D&G of 8.3% (3 cases); NHS Fife of 35% (15 cases); and NHS Lothian had 36% (15 cases). Valid clinical reasons were provided for the majority of patients with only 2 patients (2.9%) where no reason was documented.

Pathology Investigation Contraindications	**Borders**	**D&G**	**Fife**	**Lothian**
Too small to biopsy	0	1	0	9
Inaccessible to biopsy	0	0	1	9
Too small & inaccessible	1	0	0	4
Attempted biopsy	0	0	3	1
MDM decisions: biopsy too risky	1	2	8	14
Previous pneumonectomy	0	0	0	1
Poor fitness precludes biopsy	0	0	1	9
Pt unable to hold breath	0	0	0	1
Negative biopsy	0	0	0	2
No reason documented	0	0	2	0
TOTAL	**2**	**3**	**15**	**50**

ACTION PLAN 2020
- All health boards to record Herder scores at MDM for all patients without pathology who are referred for radical radiotherapy.

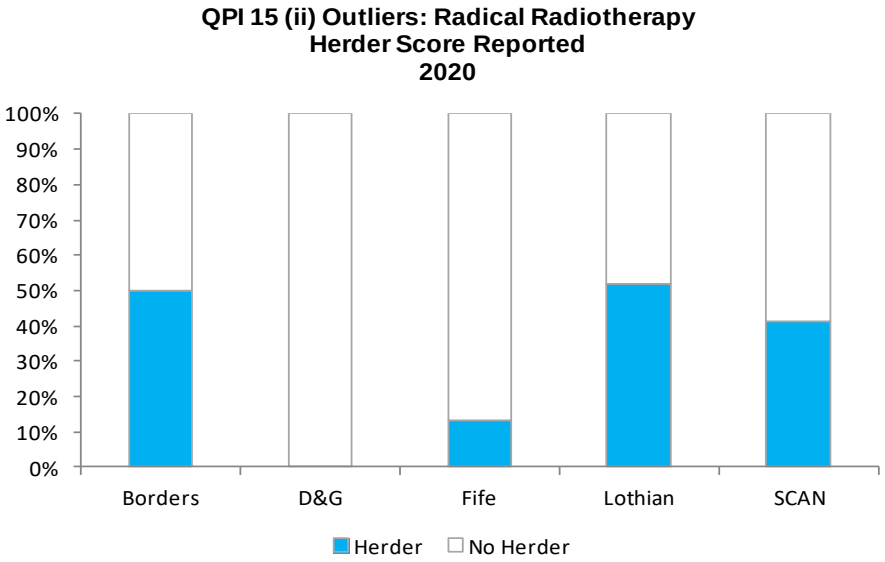


	Borders	D&G	Fife	Lothian	SCAN
2017	54.5%	60.0%	58.1%	56.9%	57.0%
2018	40.0%	72.7%	40.9%	64.0%	57.0%
2019	100.0%	100.0%	43.5%	67.0%	62.9%
2020*	60.0%	66.7%	40.0%	39.0%	42.1%
Target	75%	75%	75%	75%	75%

*The target remains at 75% but numerator criteria have been amended. Change implemented in 2020.
CAVEAT: Comparison of 2017-19 results with 2020 does not afford definitive comparison.

Formal Review Cycle 2 Revision
Numerator: Treatment was previously specified as *first* whereas is now specified as *definitive* This facilitates analyses where first treatment is reported as *watch & wait* and definitive treatment is *radical radiotherapy*.

Similar to surgical resection, 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. All patients are discussed fully at MDM so that all approaches are considered and that all proper processes take their course. The Herder Score looks at the probability of cancer as an alternative option to cytology or histology.



In Borders 1 out of 2 patients had a Herder score reported; D&G reported 0 out of 3; NHS Fife's result was 2 out of 13; and NHS Lothian achieved 26 out of 50 patients with Herder score reported.

QPI 15 (iii) Cytology or Histology prior to Radical Chemoradiotherapy

FR 2: This QPI has been consistently achieved. Moreover, given that it is good medical practice to give chemotherapy *only with pathology in place* and that this pathology indicates the appropriate chemotherapy agent (s) to be administered, it was agreed to archive this QPI at FR2.

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[27].
Exclusions = Patients who decline brain imaging and patients diagnosed with SCLC.

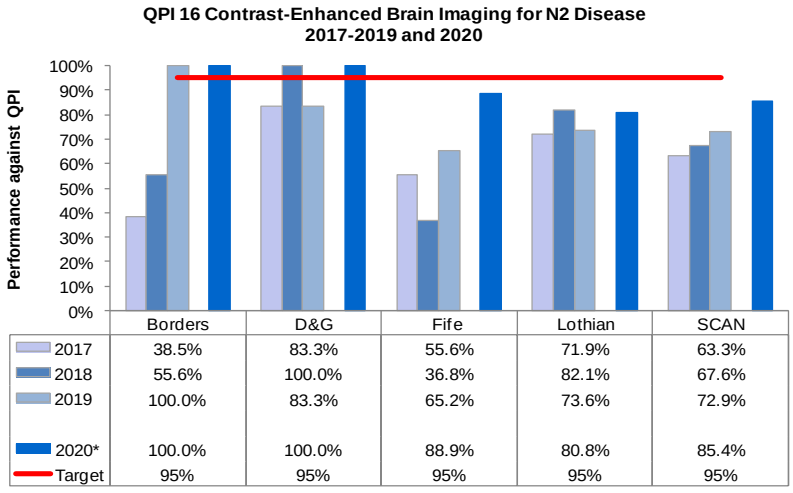
Target 95%	Borders	D&G	Fife	Lothian	SCAN
2020 cohort	85	136	299	719	1239
Ineligible for this QPI	84	131	290	693	1198
Numerator	1	5	8	21	35
Not recorded for numerator	0	0	0	0	0
Denominator	1	5	9	26	41
Not recorded for exclusions	0	0	0	0	0
Not recorded for denominator	0	3	5	39	47
% Performance	**100.0%**	**100.0%**	**88.9%**	**80.8%**	**85.4%**

Comments

The denominator criteria in QPI 16 generate very small cohorts. Results should be viewed with a degree of caution as they may simply be a consequence of small numbers and, where variation might be due to chance.

QPI 16 was met by NHS Borders and D&G in 2020. The target was not met by NHS Fife where there was a shortfall of 6.1% (1 case) nor by NHS Lothian with a shortfall of 14.2% (5 cases). Valid clinical reasons were provided for most patients. It should be noted that it is appropriate, and right, to go ahead with emergency and urgent treatment (if prior to CT Head) for best patient outcome.

CT Head Contraindications	**SCAN**
Non-contrast CT Head performed	2
CT Head after treatment had started	3
Collapsed lung, urgent radiotherapy expedited, therefore no CT Head performed.	1
TOTAL	**6**



*The target remains at 75% but numerator criteria have been amended. Change implemented in 2020.
CAVEAT: Comparison of 2017-19 results with 2020 does not afford definitive comparison.

Formal Review Cycle 2 Revision

Numerator: Treatment type was changed to *definitive* to facilitate analyses where first treatment is reported as *watch & wait* and definitive treatment is *radical*.
Exclusion: The standard treatment protocol for patients with limited SCLC is chemoradiotherapy followed by PCI. A CT Head prior to treatment, as such, is not a prerequisite for SCLC patients and, patients with a diagnosis of SCLC are therefore now excluded from this QPI.

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

QPI 17: Clinical Trials

Consented Trials/Research Study Target = 15%

Numerator = Number of patients with lung cancer consented for a clinical trial/research study.
Denominator = All patients diagnosed with lung cancer.
Exclusions = No exclusions.

2020 Consented Trials/Research Study Target = 15%

Target 15%	Borders	D&G	Fife	Lothian	SCAN
Numerator	0	0	2	16	18
Denominator	105	154	361	755	1375
% Performance	**0.0%**	**0.0%**	**0.6%**	**2.1%**	**1.3%**

Consented Trials in 2020	Numbers Recruited
A Phase I trial of LY3143921 hydrate in solid tumours	2
Lung Cancer: NUTIDE 701 Trial A study of NUC-7738 for the treatment of solid cancers or lymphoma	1
MENAC - 5	3
Cell Free Lung DNA	12
TOTAL	**18**

Comment
Total recruitment remains very low. Lung clinical trial eligibility criteria are complex and challenging which prevents many patients from entering trials. Most trials have been geared towards targeted therapies but going forward new trials for palliative patients, and with less exclusion, are becoming available.

Discussions in SCAN have considered the inclusion of diagnostic and outcome trials in respiratory medicine and surgery. These are not registered on the SCRN[28] database, the source endorsed by PHS to measure the clinical trials QPI. Using SCRN data allows for comparison with CSO (Chief Scientist Office) published data and ensures capture of all clinical trials activity. The principal benefit of this approach is that this data is already collected utilising a robust mechanism[29].

2020 Consented Trials & Research Study in addition to SCRN database	Numbers Recruited
Biobank Study SCCAMP	62
Biobank SR1418	78
A Biomarker Study on Tumour Tissue in Patients with NSCLC	8
TOTAL	148

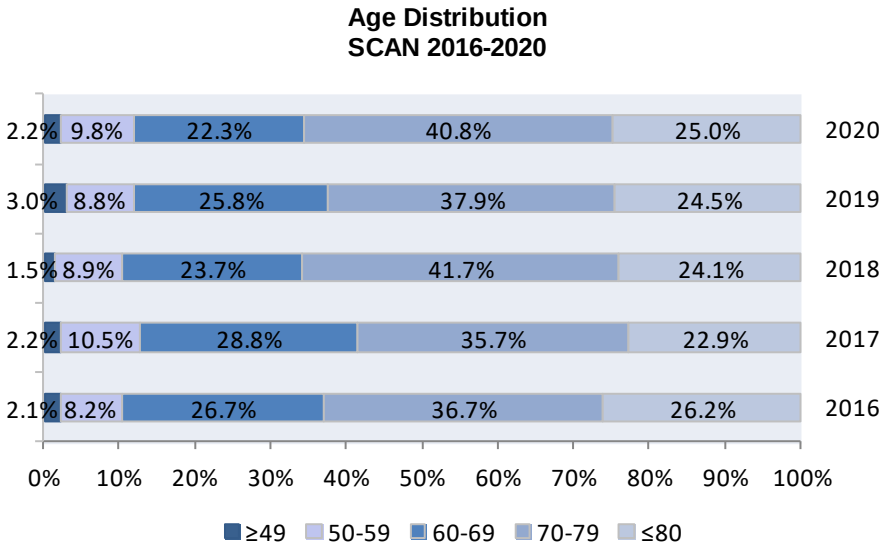
The studies that consent via the BioResource are not ‘true’ clinical trials in that they offer no benefit to the patient. Patients donate samples for laboratory research. Note: to all intents and purposes the tissue is the research subject and not the patient.

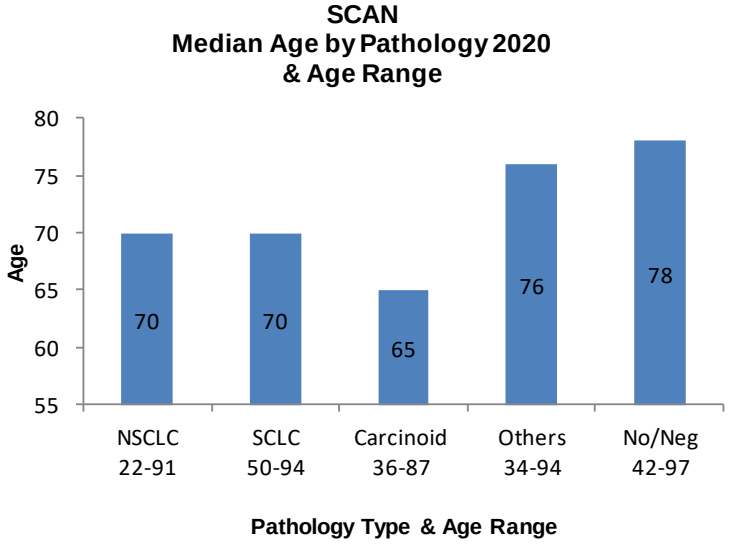
[28] SCRN: Scottish Cancer Research Network
[29] Clinical Trial & Research Access Quality Performance Indicators published by HIS; updated to v.2, October 2017.

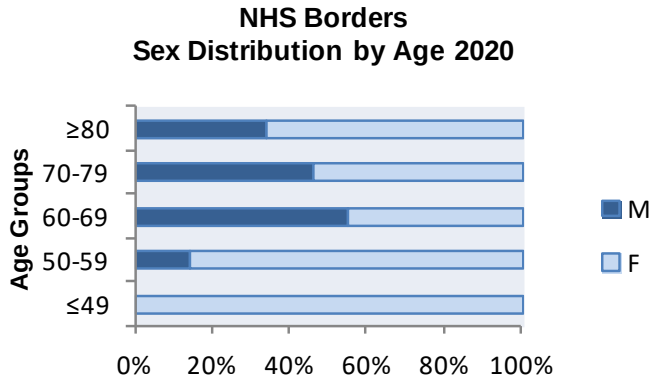
Appendices
Appendix 1: Key Categories

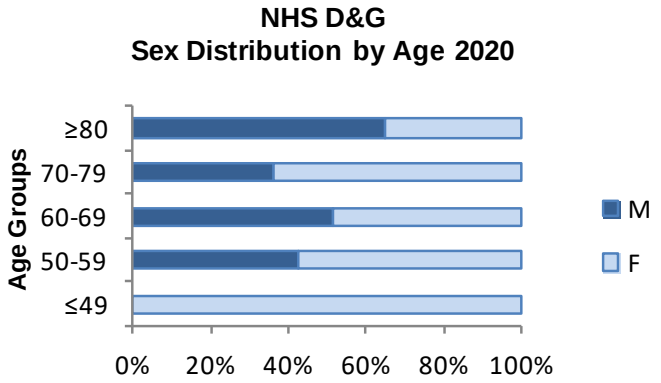
Tables: patients diagnosed with lung cancer January to December 2020. Charts: Cumulative results for years as indicated.

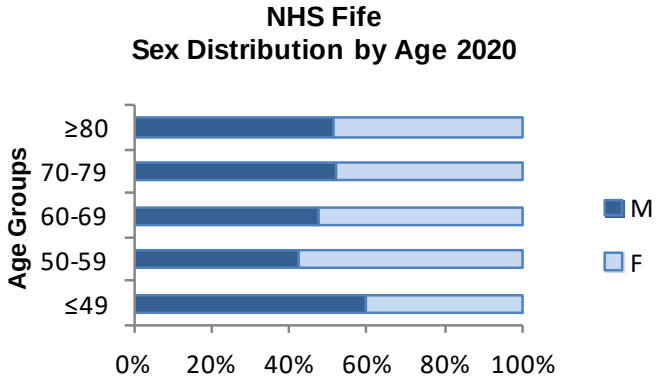
Age & Sex Distribution 2020		Borders		D&G		Fife		Lothian		SCAN	
≤49	M	0	0.0%	0	0.0%	3	60.0%	9	45.0%	12	44.4%
	F	1	100.0%	1	100.0%	2	40.0%	11	55.0%	15	55.6%
50-59	M	1	14.3%	6	42.9%	14	42.4%	39	58.2%	60	49.6%
	F	6	85.7%	8	57.1%	19	57.6%	28	41.8%	61	50.4%
60-69	M	11	55.0%	16	51.6%	29	47.5%	76	46.3%	132	47.8%
	F	9	45.0%	15	48.4%	32	52.5%	88	53.7%	144	52.2%
70-79	M	13	46.4%	18	36.0%	70	52.2%	142	48.5%	243	48.1%
	F	15	53.6%	32	64.0%	64	47.8%	151	51.5%	262	51.9%
≥80	M	10	34.5%	26	65.0%	34	51.5%	75	42.9%	145	46.8%
	F	19	65.5%	14	35.0%	32	48.5%	100	57.1%	165	53.2%
Age: Median		75		73		72		73		73	
Age: Range		50-97		49-91		33-94		22-96		22-97	

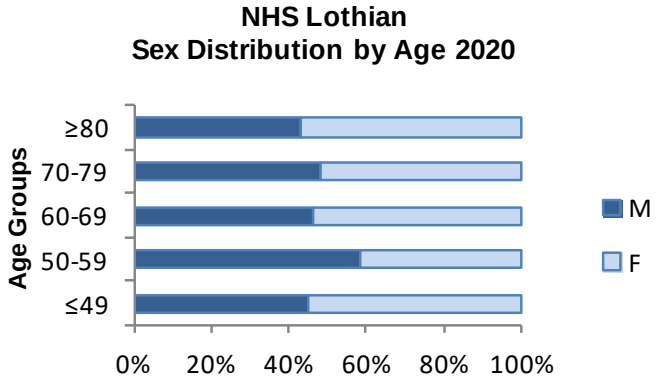










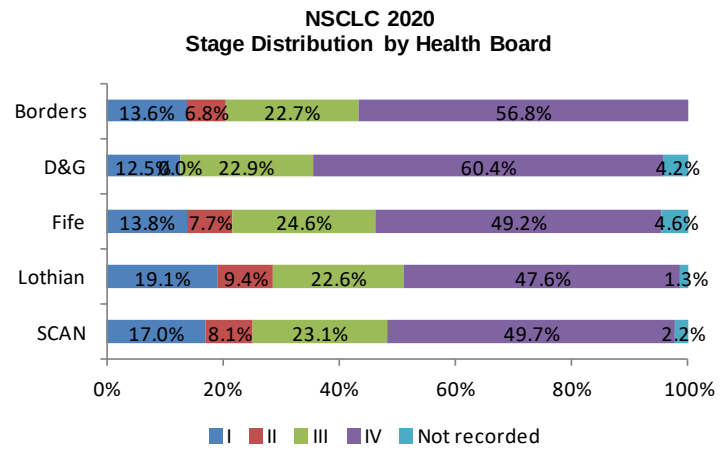


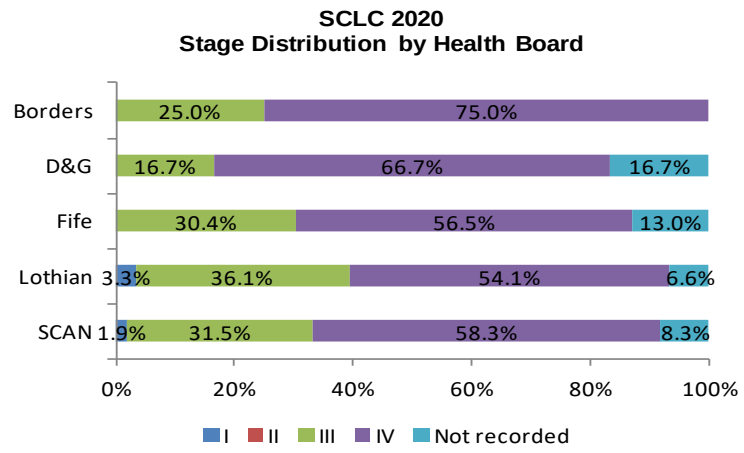
2020	Borders		D&G		Fife		Lothian		SCAN	
Performance Status										
0	19	22.4%	16	11.8%	19	6.4%	99	13.8%	153	12.3%
1	29	34.1%	36	26.5%	89	29.8%	203	28.2%	357	28.8%
2	18	21.2%	19	14.0%	65	21.7%	145	20.2%	247	19.9%
3	14	16.5%	22	16.2%	96	32.1%	165	22.9%	297	24.0%
4	4	4.7%	2	1.5%	25	8.4%	54	7.5%	85	6.9%
Not recorded	1	1.2%	41	30.1%	5	1.7%	53	7.4%	100	8.1%
Total	**85**		**136**		**299**		**719**		**1239**	
Data Completeness		**98.8%**		**69.9%**		**98.3%**		**92.6%**		**91.9%**

2020	Borders		D&G		Fife		Lothian		SCAN	
Stage NSCLC										
I	6	13.6%	6	12.5%	18	13.8%	71	19.1%	101	17.0%
II	3	6.8%	0	0.0%	10	7.7%	35	9.4%	48	8.1%
III	10	22.7%	11	22.9%	32	24.6%	84	22.6%	137	23.1%
IV	25	56.8%	29	60.4%	64	49.2%	177	47.6%	295	49.7%
Not recorded	0	0.0%	2	4.2%	6	4.6%	5	1.3%	13	2.2%
Total	**44**		**48**		**130**		**372**		**594**	
Data Completeness		**100%**		**95.8%**		**95.4%**		**98.7%**		**97.8%**
Stage SCLC										
I	0	0.0%	0	0.0%	0	0.0%	2	3.3%	2	1.9%
II	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
III	3	25.0%	2	16.7%	7	30.4%	22	36.1%	34	31.5%
IV	9	75.0%	8	66.7%	13	56.5%	33	54.1%	63	58.3%
Not recorded	0	0.0%	2	16.7%	3	13.0%	4	6.6%	9	8.3%
Total	**12**		**12**		**23**		**61**		**108**	
Data Completeness		**100%**		**83.3%**		**87.0%**		**93.4%**		**91.7%**

Stage reported for 2020 cohort: ALL PATIENTS: histological (incl carcinoid & other malignancy) & imaging (no & negative histology) diagnoses

Data Completeness	**97.6%**	**90.4%**	**93.3%**	**93.6%**	**93.3%**

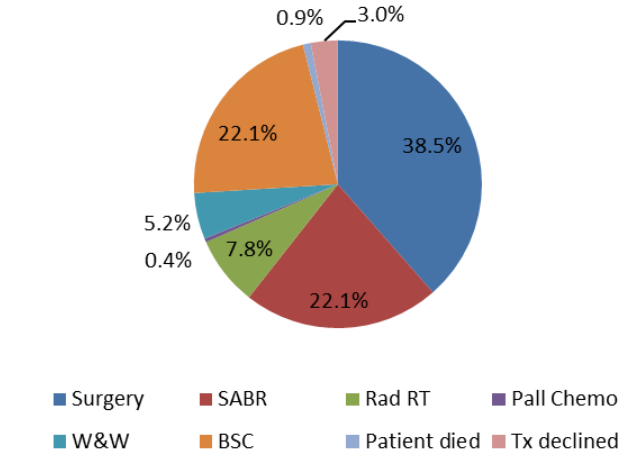




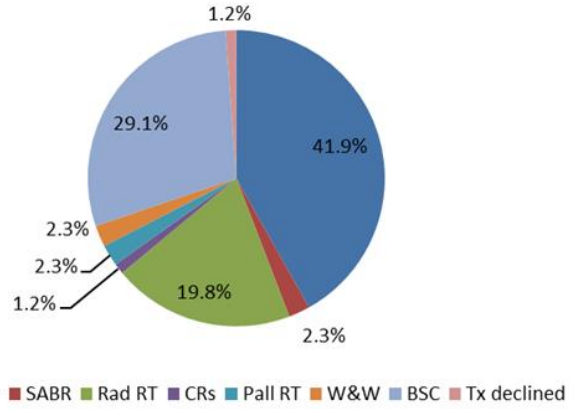
2020	Borders		D&G		Fife		Lothian		SCAN	
Pathology Type										
Squamous	10	11.8%	15	11.0%	28	9.4%	113	15.7%	166	13.4%
Adenocarcinoma	27	31.8%	28	20.6%	88	29.4%	218	30.3%	361	29.1%
NSCLC (NOS)	4	4.7%	1	0.7%	10	3.3%	29	4.0%	44	3.6%
Other specific NSCLC	2	2.4%	4	2.9%	3	1.0%	11	1.5%	20	1.6%
NSCLC combination	1	1.2%	0	0.0%	1	0.3%	1	0.1%	3	0.2%
SCLC	12	14.1%	12	8.8%	22	7.4%	59	8.2%	105	8.5%
SCLC/NSCLC mixed	0	0.0%	0	0.0%	1	0.3%	2	0.3%	3	0.2%
Carcinoid	1	1.2%	1	0.7%	2	0.7%	4	0.6%	8	0.6%
Other malignancy	0	0.0%	1	0.7%	3	1.0%	4	0.6%	8	0.6%
Negative Pathology	3	3.5%	8	5.9%	6	2.0%	18	2.5%	35	2.8%
Declined Investigation	4	4.7%	5	3.7%	9	3.0%	21	2.9%	39	3.1%
No Pathology	21	24.7%	61	44.9%	126	42.1%	239	33.2%	447	36.1%
Not recorded	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	**85**		**136**		**299**		**719**		**1239**	
NSCLC	44	51.8%	48	35.3%	130	43.5%	372	51.7%	594	47.9%
SCLC	12	14.1%	12	8.8%	23	7.7%	61	8.5%	108	8.7%
Carcinoid & other	1	1.2%	2	1.5%	5	1.7%	8	1.1%	16	1.3%
Radiological diagnosis	28	32.9%	74	54.4%	141	47.2%	278	38.7%	521	42.1%

2020	Borders		D&G		Fife		Lothian		SCAN	
First Treatment										
Surgery	10	11.8%	15	11.0%	36	12.0%	93	12.9%	154	12.4%
SABR	3	3.5%	4	2.9%	9	3.0%	39	5.4%	55	4.4%
Radical Radiotherapy	10	11.8%	3	2.2%	15	5.0%	40	5.6%	68	5.5%
Chemoradiotherapy	4	4.7%	9	6.6%	9	3.0%	26	3.6%	48	3.9%
Palliative Chemotherapy	13	15.3%	9	6.6%	20	6.7%	57	7.9%	99	8.0%
Biological Therapy	7	8.2%	6	4.4%	16	5.4%	42	5.8%	71	5.7%
Palliative Radiotherapy	0	0.0%	7	5.1%	31	10.4%	61	8.5%	99	8.0%
Other Therapy	0	0.0%	0	0.0%	0	0.0%	1	0.1%	1	0.1%
Watchful Waiting	0	0.0%	2	1.5%	7	2.3%	24	3.3%	33	2.7%
Best Supportive Care (BSC)	32	37.6%	78	57.4%	135	45.2%	306	42.6%	551	44.5%
Declined all therapies	2	2.4%	1	0.7%	5	1.7%	13	1.8%	21	1.7%
Died before treatment	4	4.7%	2	1.5%	16	5.4%	17	2.4%	39	3.1%
Total	**85**		**136**		**299**		**719**		**1239**	

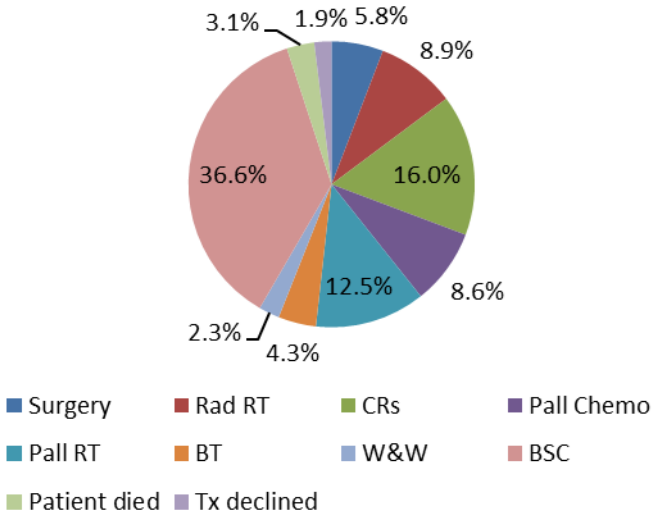
First Treatment – Patients with Stage I – SCAN 2020



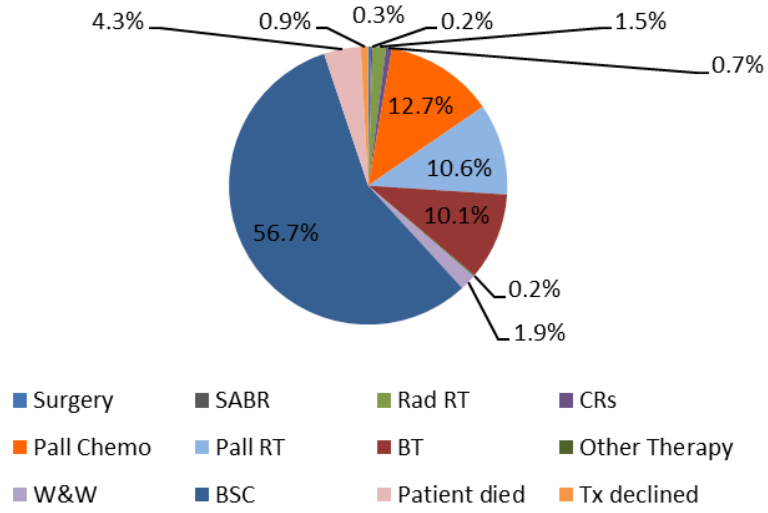
First Treatment – Patients with Stage II – SCAN 2020



First Treatment – Patients with Stage III – SCAN 2020



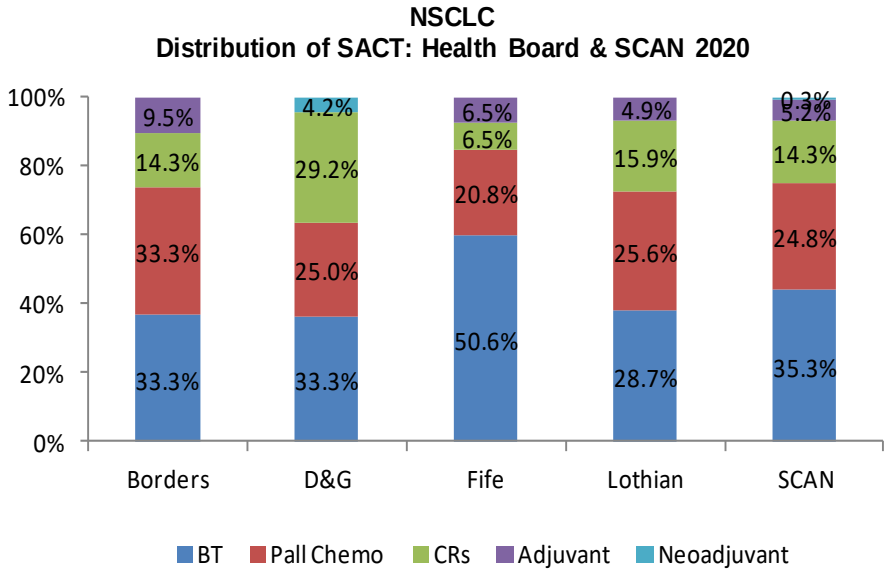
First Treatment – Patients with Stage IV – SCAN 2020

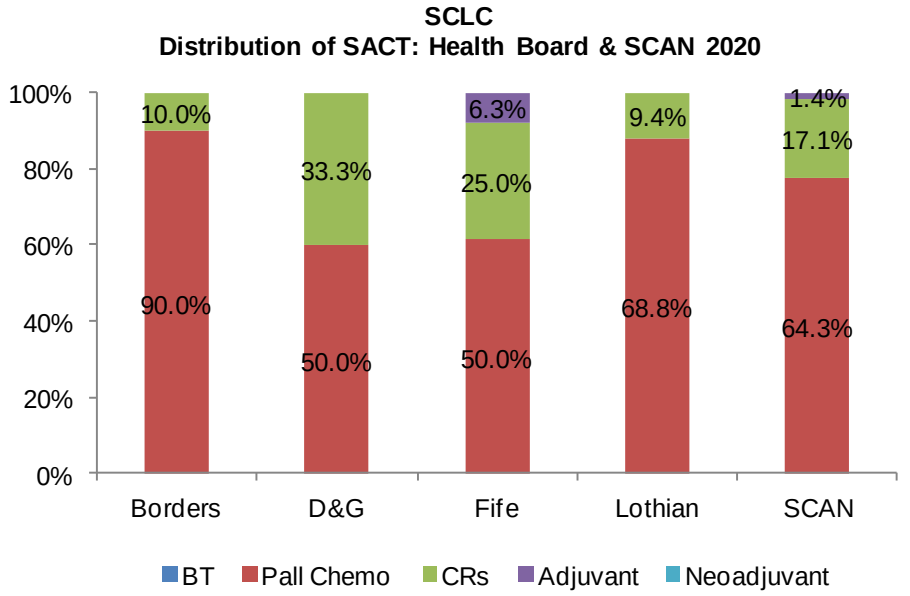


2020	Borders		D&G		Fife		Lothian		SCAN	
Clinical Nurse Specialist										
Seen by CNS	83	97.6%	122	89.7%	291	97.3%	654	91.0%	1150	92.8%
Surgery: all surgical patients										
Pneumonectomy	0	0.0%	0	0.0%	2	5.6%	1	1.0%	3	1.9%
Lobectomy	8	80.0%	10	66.7%	33	91.7%	84	86.6%	135	84.9%
Wedge	0	0.0%	4	26.7%	1	2.8%	4	4.1%	9	5.7%
Segmental	2	20.0%	1	6.7%	0	0.0%	7	7.2%	10	6.3%
Other surgery	0	0.0%	0	0.0%	0	0.0%	1	1.0%	1	0.6%
Inoperable	0	0.0%	0	0.0%	0	0.0%	1	n/a	1	0.6%
Total	**10**		**15**		**36**		**97**		**159**	
Total lung cancer & % receiving surgery	**85**	**11.8%**	**136**	**11.0%**	**299**	**12.0%**	**719**	**13.5%**	**1239**	**12.8%**

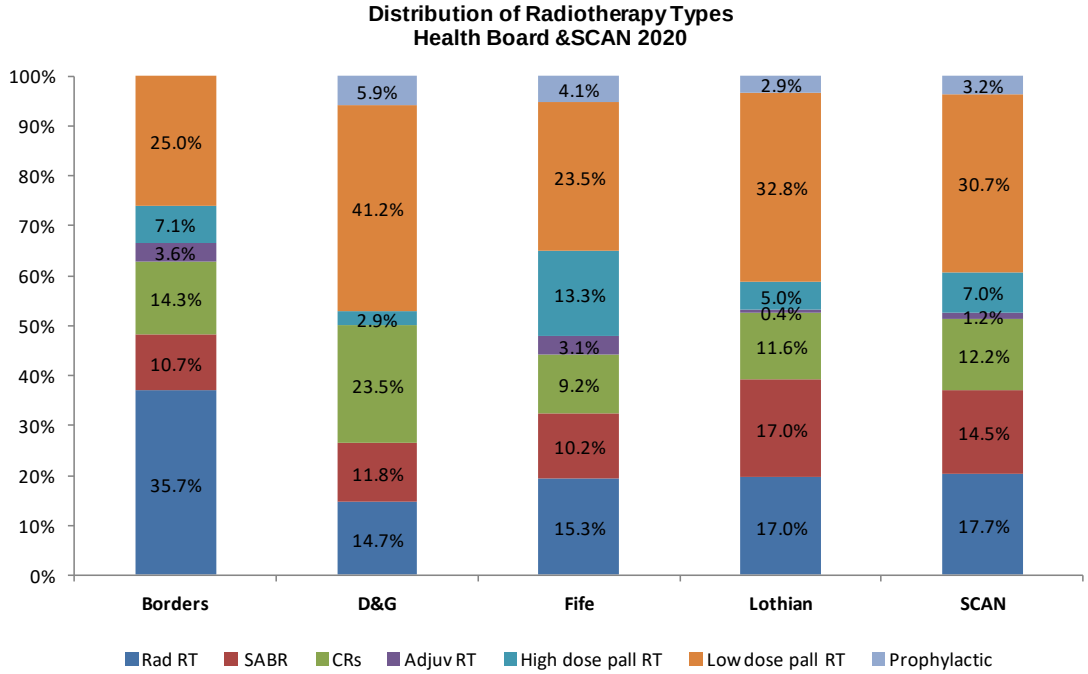
2020	Borders		D&G		Fife		Lothian		SCAN	
SACT: NSCLC										
Neoadjuvant chemotherapy	0	0.0%	1	4.2%	0	0.0%	0	0.0%	1	0.3%
Adjuvant chemotherapy	2	9.5%	0	0.0%	5	6.5%	8	4.9%	15	5.2%
Chemoradiotherapy	3	14.3%	7	29.2%	5	6.5%	26	15.9%	41	14.3%
Palliative chemotherapy	7	33.3%	6	25.0%	16	20.8%	42	25.6%	71	24.8%
Biological Therapy (TKIs + Immunotherapy)	7	33.3%	8	33.3%	39	50.6%	47	28.7%	101	35.3%
Declined SACT	0	0.0%	2	8.3%	5	6.5%	32	19.5%	39	13.6%
Patient died before SACT	2	9.5%	0	0.0%	7	9.1%	9	5.5%	18	6.3%
TOTAL	**21**		**24**		**77**		**164**		**286**	
Total NSCLC & % receiving SACT	**44**	**47.7%**	**48**	**50.0%**	**130**	**59.2%**	**372**	**44.1%**	**594**	**48.1%**
SACT: SCLC										
Neoadjuvant chemotherapy	0	0.0%	0	0.0%	0	0.0%	1	3.1%	1	1.4%
Adjuvant chemotherapy	0	0.0%	0	0.0%	1	6.3%	0	0.0%	1	1.4%

2020	Borders		D&G		Fife		Lothian		SCAN	
Chemoradiotherapy	1	10.0%	4	33.3%	4	25.0%	2	6.3%	11	15.7%
Palliative chemotherapy	9	90.0%	6	50.0%	8	50.0%	22	68.8%	45	64.3%
Biological Therapy (TKIs + Immunotherapy)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Declined SACT	0	0.0%	1	8.3%	3	18.8%	6	18.8%	10	14.3%
Patient died before SACT	0	0.0%	1	8.3%	0	0.0%	1	3.1%	2	2.9%
TOTAL	**10**		**12**		**16**		**32**		**70**	
Total SCLC & % receiving SACT	**12**	**83.3%**	**12**	**100.0%**	**23**	**69.6%**	**61**	**52.5%**	**108**	**64.8%**





2020 **Radiotherapy**	Borders		D&G		Fife		Lothian		SCAN	
Radical radiotherapy: conventional	10	35.7%	5	14.7%	15	15.3%	41	17.0%	71	17.7%
Radical radiotherapy: SABR	3	10.7%	4	11.8%	10	10.2%	41	17.0%	58	14.5%
Chemoradiotherapy	4	14.3%	8	23.5%	9	9.2%	28	11.6%	49	12.2%
Adjuvant radiotherapy	1	3.6%	0	0.0%	3	3.1%	1	0.4%	5	1.2%
High dose palliative radiotherapy	2	7.1%	1	2.9%	13	13.3%	12	5.0%	28	7.0%
Low dose palliative radiotherapy	7	25.0%	14	41.2%	23	23.5%	79	32.8%	123	30.7%
Prophylactic	0	0.0%	2	5.9%	4	4.1%	7	2.9%	13	3.2%
Declined radiotherapy	1	3.6%	0	0.0%	5	5.1%	19	7.9%	25	6.2%
Patient died before radiotherapy	0	0.0%	0	0.0%	16	16.3%	13	5.4%	29	7.2%
Total	**28**		**34**		**98**		**241**		**401**	
Distribution of Radiotherapy Given										
Radical	18	66.7%	17	50.0%	37	48.1%	111	53.1%	183	52.7%
Palliative	9	33.3%	17	50.0%	40	51.9%	98	46.9%	164	47.3%
Total	**27**		**34**		**77**		**209**		**347**	
Total lung cancer & % receiving RT	**85**	**31.8%**	**136**	**25.0%**	**299**	**25.8%**	**719**	**29.1%**	**1239**	**28.0%**



Appendix 2: Historical QPI Attainment Summary – 2019

Lung Cancer QPI Attainment Summary 2019			Target %	Borders		D&G		Fife		Lothian		SCAN	
QPI 1 MDT discussion before definitive treatment			95	N 81 D 82	98.8%	N 140 D 145	96.6%	N 330 D 350	94.3%	N 651 D 713	91.3%	N 1202 D 1290	93.2%
QPI 2 Pathological Diagnosis	All patients with lung cancer		80	N 63 D 80	78.8%	N 94 D 142	66.2%	N 212 D 351	60.4%	N 462 D 713	64.8%	N 831 D 1286	64.6%
	NSCLC with sub-type identified		90	N 54 D 56	96.4%	N 76 D 79	96.2%	N 163 D 179	91.1%	N 330 D 361	91.4%	N 623 D 675	92.3%
	Non squamous IIIB-IV: molecular profiling		75	N 24 D 29	82.8%	N 26 D 30	86.7%	N 69 D 85	81.2%	N 136 D 158	86.1%	N 255 D 302	84.4%
QPI 4 Patients being treated with curative intent who have a PET/CT before treatment			95	N 18 D 19	94.7%	N 30 D 30	100%	N 65 D 65	100%	N 154 D 162	95.1%	N 267 D 276	96.7%
*QPI 6 Surgical resection in NSCLC patients	All NSCLC		20	N 14 D 56	25.0%	N 18 D 78	23.1%	N 32 D 168	19.0%	N 75 D 350	21.4%	N 139 D 652	21.3%
	NSCLC Stage I-II		60	N 11 D 13	84.6%	N 12 D 18	66.7%	N 30 D 40	75.0%	N 64 D 88	72.7%	N 117 D 159	73.6%
*QPI 7 Lymph node assessment for NSCLC patients having pneumonectomy or lobectomy			80	Analysis is by Hospital of Surgery: RIE						N 107 D 131	81.7%	N D	n/a
QPI 8 Radiotherapy (including SABR) for inoperable lung cancer			35	N 5 D 18	27.8%	N 12 D 41	29.3%	N 59 D 121	48.8%	N 135 D 304	44.4%	N 211 D 484	43.6%
QPI 9 Chemoradiotherapy for locally advanced NSCLC			50	N 1 D 1	100%	N 1 D 1	100%	N 5 D 7	71.4%	N 8 D 16	50.0%	N 15 D 25	60.0%
QPI 10 Chemoradiotherapy for limited stage SCLC			70	N 0 D 1	0.0%	N 0 D 0	n/a	N 6 D 6	100%	N 24 D 32	75.0%	N 30 D 39	76.9%
QPI 11 SACT for patients with inoperable NSCLC	All types of SACT for NSCLC		35	N 15 D 38	39.5%	N 25 D 58	43.1%	N 65 D 138	47.1%	N 96 D 266	36.1%	N 201 D 500	40.2%
	Biological therapy for NSCLC stage IIIB-IV, PS 0-1		60	N 0 D 0	n/a	N 0 D 0	n/a	N 5 D 5	100%	N 17 D 27	63.0%	N 22 D 32	68.8%
QPI 12 SACT for patients with SCLC	All types of chemotherapy for SCLC		70	N 5 D 6	83.3%	N 5 D 12	41.7%	N 20 D 26	76.9%	N 69 D 89	77.5%	N 99 D 133	74.4%
	Palliative chemotherapy for SCLC patients having treatment with non-curative intent		50	N 4 D 5	80.0%	N 5 D 12	41.7%	N 13 D 19	68.4%	N 39 D 58	67.2%	N 61 D 94	64.9%

Lung Cancer QPI Attainment Summary 2019		Target %	Borders	D&G	Fife	Lothian	SCAN
*QPI 13.1 30 Day Mortality After Treatment	*Surgery	<5	Analysis is by Hospital of Surgery: RIE			N 3 D 166 1.8%	N D n/a
	Radical Radiotherapy	<5	N 0 D 3 0.0%	N 0 D 10 0.0%	N 1 D 45 2.2%	N 1 D 109 0.9%	N 2 D 167 1.2%
	Adjuvant Chemotherapy	<5	N 0 D 1 0.0%	N 0 D 2 0.0%	N 0 D 2 0.0%	N 0 D 8 0.0%	N 0 D 13 0.0%
	Chemoradiotherapy	<5	N 0 D 4 0.0%	N 0 D 2 0.0%	N 0 D 21 0.0%	N 0 D 58 0.0%	N 0 D 85 0.0%
	Palliative Chemotherapy (NSCLC)	<10	Centralised reports will be available from ChemoCare in due course.				
	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 4 D 164 2.4%	N D n/a
	Radical Radiotherapy	<5	N 1 D 3 33.3%	N 0 D 10 0.0%	N 5 D 45 11.1%	N 6 D 108 5.6%	N 12 D 166 7.2%
	Chemoradiotherapy	<5	N 0 D 4 0.0%	N 0 D 2 0.0%	N 1 D 21 4.8%	N 2 D 57 3.5%	N 3 D 84 3.6%
QPI 14 SABR for Inoperable Lung Cancer with Stage I Disease		35	N 0 D 7 0.0%	N 1 D 8 12.5%	N 13 D 33 39.4%	N 38 D 83 45.8%	N 52 D 131 39.7%
QPI 15 Cytological/Pathological Diagnosis Prior to Treatment	Surgery	75	N 11 D 15 73.3%	N 9 D 18 50.0%	N 26 D 34 76.5%	N 41 D 80 51.3%	N 87 D 147 59.2%
	Radical Radiotherapy	75	N 3 D 3 100%	N 9 D 9 100%	N 20 D 46 43.5%	N 73 D 109 67.0%	N 105 D 167 62.9%
	Chemoradiotherapy	75	N 3 D 4 75%	N 3 D 3 100%	N 21 D 21 100%	N 58 D 58 100%	N 85 D 86 98.8%
QPI 16 Contrast CT/MRI for N2 Pts Prior to Curative Treatment		95	N 3 D 3 100%	N 5 D 6 83.3%	N 15 D 23 65.2%	N 39 D 53 73.6%	N 62 D 85 72.9%
Clinical Trials N=patients consented to trials/research and held on SCRN database. D= 5year average from Cancer Registry		15	N 1 D 106 0.9%	N 0 D 155 0.0%	N 4 D 354 1.1%	N 15 D 762 2.0%	N 20 D 1377 1.5%

Lung Cancer QPI Attainment Summary 2019	Target %	Borders	D&G	Fife	Lothian	SCAN
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 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 *not applicable*.

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: SCLC Pathway Audit in NHS Lothian in 2018.

UNDERSTANDING THE PATHWAY FOR PATIENTS DIAGNOSED WITH SMALL CELL LUNG CANCER WHO DID NOT RECEIVE CHEMOTHERAPY IN 2018 IN NHS LOTHIAN

Dr Ashley Pheely StR5 Medical Oncology Registrar

Introduction

Small cell lung cancer is a rapid growing and highly chemo-sensitive malignancy. Given the considerable malignant burden of this cancer, if not urgently diagnosed and treated it swiftly leads to a patient`s demise.

The highly chemo-sensitive nature of this cancer often means that, even for those patients that present decidedly co-morbid from their cancer symptoms, giving chemotherapy can result in an improvement in symptoms and prognosis.

Quality Performance Indicators (QPIs) are used as targets to try and drive improvement in lung cancer services. During 2017 and 2018, it was noted that NHS Lothian failed to achieve QPI12 (i) that related to the number of SCLC patients who received chemotherapy.

This audit aims to further explore why this was the case. It looks at the patient journey from initial presentation to MDT discussion and in particular tries to determine whether there are any areas within the pathway that can be improved.

What is QPI12 (i) and what was the Outcome for Lothian in 2018?

QPI12 (i) – the number of patients with SCLC who receive first line chemotherapy. Denominator: all patients with SCLC. Exclusions: excludes patients who refuse chemotherapy, patients who die before treatment and patients who are participating in clinical trials. 58% of patients (38 out of 66) diagnosed with SCLC in 2018 received chemotherapy with the target being 70%.

Who was included in this audit?

The initial database for the QPI12 (i) analysis included all patients who were diagnosed with SCLC in Lothian in 2018. It included 33 patients who did not receive chemotherapy. 3 patients were removed because, although suspected, they did not have a histological diagnosis of SCLC. The data that was presented to the national audit database only included 28 patients as 1 patient died prior to receiving chemotherapy and 1 patient declined chemotherapy. However, for the purpose of this audit it was decided to include them in this analysis as it was looking more specifically at the patient`s journey, co-morbidities and performance status.

38 patients who were diagnosed with SCLC in Lothian in 2018 who went on to receive chemotherapy were also included to try and determine whether there was a significant difference between these two groups of patients and whether any improvements could be made in the future to improve the QPI12(i) target.

The SCLC Patient Journey from Presentation to MDT

56% (17 out of 30) of patients who did not receive chemotherapy initially presented with possible cancer through an acute presentation to the hospital setting (inpatient). While 39% (15 out of 38) of patients who did receive chemotherapy initially had an acute presentation to the hospital setting (inpatient).

For those who did not receive chemotherapy, the average time from initial presentation as an inpatient to biopsy was 20 days. Whereas for those who did receive SACT the average time from initial presentation as an inpatient to biopsy was 16 days.

The average time for those who presented through an outpatient referral (either from primary care or from a secondary care outpatient referral other than respiratory) to biopsy and did not receive chemotherapy was 25 days and for those that did receive chemotherapy it was 22 days.

The average time from biopsy to pathology results being available for those patients who did not receive chemotherapy was 6 days and for those who did receive chemotherapy it was 7 days.

The average time from pathology results being available to MDT discussion for those who did not receive chemotherapy was 7 days and for those patients that did receive chemotherapy it was 5 days.

Oncology Input for SCLC Patients

19 out of 30 patients who were diagnosed with SCLC but did not receive chemotherapy were not reviewed by oncology. 13 were discussed at MDT and considered not suitable for systemic therapy because of frailty and co-morbidities and underwent best supportive care. 5 died prior to MDT discussion and 1 patient died prior to their oncology appointment.

For the 11 patients who did not receive chemotherapy but were reviewed by oncology - 4 were seen on the same day as the MDT decision, 6 were seen within 7 days (with 1 patient being seen as an inpatient) and 1 was seen within 14 days (average 4 days).

62 day Waiting Time Target

4 patients would have exceeded the 62 days cancer waiting time targets if they were to have been suitable for chemotherapy. 3 of these patients required more than one biopsy to obtain sufficient tissue for histological diagnosis. 1 patient initially presented to a medicine for the elderly day hospital for assessment of mobility issues – other avenues of differential diagnosis and investigation were taken prior to a radiological diagnosis of malignancy and further investigation.

Performance Status of Patients with SCLC

53% (16 out of 30) of patients who did not receive chemotherapy were performance status 3 or 4 at presentation. Whereas only 8% (3 out of 38) of patients who did receive SACT were PS 3 or 4 at the time of presentation.

Table 1	No Chemotherapy	Chemotherapy
Number of patients	30	38
Presented through inpatient encounter leading to diagnosis	57% (17/30)	40% (15/38)
Presented through outpatient encounter leading to diagnosis	43% (13/30)	60% (23/38)
Time from initial presentation to biopsy (*inpatient)	20days	16days
Time from initial presentation to biopsy (outpatient)**	25days	22days
Time from biopsy to pathology results being available	6days	7days
Time from pathology results being available to MDT	7days	5days
Time from initial presentation to MDT ***inpatient** ****outpatient**	 33days 38days	 28days 34days
Patients who were reviewed by oncology	36% (11/30)	
PS 3 or more at presentation	53% (16/30)	8% (3/38)

Table 1: - patients diagnosed with SCLC within Lothian during 2018.

*Initial presentation that led to the patient`s diagnosis that occurred through an acute presentation to secondary care.

**Initial presentation that led to the patient`s diagnosis that occurred through a presentation and referral from primary care or through a referral from an outpatient clinical encounter with a secondary care specialty other than respiratory.

Discussion

One of the most significant findings from this report is that 63% of (19 out of 30) of patients who did not receive chemotherapy were not reviewed by an oncology specialist. With 53% of these patients being PS 3 or 4 at presentation, 97% of them having significant co-morbidities and 56% presenting during an acute inpatient stay - it is unlikely that any of these patients would have been appropriate candidates for chemotherapy. It is also important to note that all of these patients were discussed at an MDT with specialist oncology treatment opinion given. Nevertheless, given that even in patients who require inpatient chemotherapy, 2/3rds have an improvement in their symptom control; an increase in review of inpatients diagnosed with SCLC by oncology may result in an increase in appropriate chemotherapy administration. However, this will always need to be weighed up against the patient`s wishes; the importance of other aspects of palliation such as timing of hospice care; and indeed the suitability of each individual patient when considering the risks vs. the benefits of chemotherapy.

97% (29 of 30) of patients who did not receive SACT had significant co-morbidities. With the most common being COPD, T2DM, cardiovascular diseases (including IHD, PVD and CVA) and having been treated for a previous malignancy. The co-morbid disposition of patients that develop SCLC further emphasizes their often already frail nature. The high incidence of chronic illness in this group may also signify the difficulties faced by healthcare professionals when considering differential diagnoses, and indeed the possibility of cancer, because of the chronicity of `red flag` symptoms in some of these patients.

Conclusion

The high number of patients diagnosed with SCLC who did not receive chemotherapy in Lothian in 2018 reflects the rapidity in which this disease causes relentless deterioration in an already frail patient group as opposed to concerns with a protracted patient pathway.

Next Steps

It was noted that there does not appear to be a standardised referral pathway for a patient that has had an incidental inpatient diagnosis of a malignancy or a diagnosis from another outpatient specialty. Referrals that came from other outpatient specialties often took longer to process compared to primary care referrals. It is also apparent that there were certain cases in which patients were referred through non-urgent respiratory pathways. This inevitably led to some of these patients presenting acutely while waiting for appropriate secondary care input.

In view of this, work was done with the pathology department to set up an automated '**Small cell diagnosis alert**' in October 2020. This sends the details of any new patient with small cell on a biopsy to the two medical oncology consultants who specialise in lung cancer so that an oncology appointment can be booked proactively without waiting for a referral. The oncology team then liaise with the team looking after the patient to offer the appointment as appropriate.

Appendix 4: 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 5: 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 6: TNM Classification

TNM Classification of Malignant Tumours, 8th Edition, International Association for the Study of Lung Cancer (IASLC), 2016

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 7: Acknowledgements

Clinical and Audit Staff who contributed to the Lung Cancer Comparative Report 2020.

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REFERENCES

British Lung foundation https://www.blf.org.uk

Cancer Research UK*: http://www.cancerhelp.org.uk*

Healthcare Improvement Scotland (HIS): *Lung Cancer Clinical Quality Performance Indicators (Version 3.1, June 2017 and Version 4.0, November 2020)*. http://www.healthcareimprovementscotland.org/our_work/cancer_care_improvement/cancer_qpis.aspx

IASLC (2016): *Stage Grouping for the 8th Edition of the TNM Classification of Lung Cancer*. https://www.iaslc.org/Portals/0/35348-cards-erx_combined_trap_card3_1_copy.pdf?ver=2019-05-22-154420-317

ISD Scotland (2019): *Data Definitions for the National Minimum Core Dataset to Support the Introduction of Lung Cancer Quality Performance Indicators (Version 3.3: March 2019 and Version 3.4, May 2020 and Version 3.5, July 2020)*. https://www.isdscotland.org/Health-Topics/Cancer/Cancer-Audit/

ISD Scotland (2019): *Lung Cancer Measurability of Quality Performance Indicators (Version 3.4: March 2019)*. https://www.isdscotland.org/Health-Topics/Cancer/Cancer-Audit/

Macmillan Cancer Support: http://www.macmillan.org.uk/Home.aspx

NCBI: National Centre for Biotechnology Information: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6071030/

NICE: National Institute for Health and Care Excellence (March 2019): *Lung Cancer: Diagnosis and Management, Clinical Guideline [NG122]*. https://www.nice.org.uk/guidance/ng122

NICE: National Institute for Health and Care Excellence (2012, updated 2019): *Lung Cancer in Adults, Quality Standard [QS 17]* https://www.nice.org.uk/guidance/qs17/chapter/Quality-statement-3-Lung-cancer-clinical-nurse-specialist

NLCA: National Lung Cancer Audit: https://www.rcplondon.ac.uk/projects/national-lung-cancer-audit

The Roy Castle Lung Cancer Foundation & the National Lung Cancer Forum for Nurses (January 2013) *Understanding the Value of Lung Cancer Nurse Specialists.* http://documents.roycastle.org/UnderstandTheValueOfLungCancerNurseSpecialists_V03.pdf

SABR UK Consortium (January 2019) *Stereotactic Ablative Body Radiation Therapy (SABR): A Resource, Version 6.1*. https://www.sabr.org.uk/wp-content/uploads/2019/04/SABRconsortium-guidelines-2019-v6.1.0.pdf

Scottish Government and Healthcare Improvement Scotland (2015): *Scottish Cancer Taskforce: Lung Cancer Clinical Quality Performance Indicators (Version 2.1: March 2015).*