SCAN
South East Scotland Cancer Network

NHS SCOTLAND

Working regionally to improve cancer services

SOUTH EAST SCOTLAND CANCER NETWORK
PROSPECTIVE CANCER AUDIT

Lung Cancer 2018
QPI Comparative Audit Report

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Document History

Version	Circulation	Date	Comments
Version 1	Lead Clinicians	22/08/2019	Draft results and outliers circulated.
Version 1.1	SCAN Lung Group To present at Clinical Sign-off Meeting 19/09/2019	16/09/2019	Amendments to be made as agreed at Clinical Sign-off Meeting.
Version 2	Lead Clinician & Regional Audit/Sign Off Sub Group	28/10/2019	To clarify Actions and provide and/or agree outstanding clinical commentary. Lead Clinician to supply “Chair Summary”.
Version 3	To Lead Clinician & SCAN Lung Group.	21/11/2019	For final comment by 29/11/2019.
Version 4 Final SCAN Report Index	SCAN Lung Group SCAN Governance Framework SCAN Action Plan Board Leads	06/12/2019	Any potentially disclosive data to be removed prior to publication on SCAN Website.
Version 4W	Report published to SCAN Website	28/01/2021	Potentially disclosive comments removed

Chair Summary

SCAN Lung Cancer 2018 Quality Performance Indicators (QPI) Comparative Report
Comment by Chair of the SCAN Lung Group

At a time of great change for lung cancer patients and options for treatment it is very useful to look at how we are performing against national and international benchmarks. In this report we have included the Scottish national QPI 2018 figures from our national meeting in November 2019 to help gauge where we are in SCAN region. 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 (with Information Services Division, Scotland (ISD)) or timelines on that pathway (devolved to waiting times 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 2 and 15 around pathological diagnosis remain very challenging across the network and throughout Scotland. Sometimes gaining a tissue diagnosis will have very little impact on the decision making for patients and can have risks as well as being uncomfortable for patients. However diagnosis prior to definitive curative therapy (QPI 15) aims to look at patients who merit knowing they have cancer before agreeing to the treatment. Gaining a biopsy can be technically challenging due to size or location of the tumour but also the risks of severe harm of the biopsy can sometimes be higher than the actual treatment option e.g. biopsy in severe emphysema versus Stereotactic Ablative Radiotherapy (SABR). Tolerance has been built into the QPI to allow for this, however we all acknowledge there can be an unclear fine line between biopsy risk and benefit, which can also be subject to personal variance between clinicians. We have agreed to undertake a more detailed analysis of outliers of QPI 2 and15, over the coming year, including some peer review work, to examine this in more detail.

QPIs are always a work in progress and the second round of lung cancer QPI reviews are due in 2020. We make some references to this throughout the document. There also require some new QPIs to acknowledge new treatments e.g. immunotherapy.
The audit team at the Borders General has undergone change in the last year and due to training it has not been possible to include their data in this report. We look forward to reviewing that data with 2019 data in the next report.
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
November 2019

Clinical Action Points

Action Points 2018: Action Plans should be completed and finalised at board level by Lead Clinicians and approved by Executive Leads.

QPI	Action required	Person Responsible
QPI 1	To ensure that all inpatients who are seen by Medicine of the Elderly (MoE), General Medicine (GenMed) and/or Respiratory and have been diagnosed with lung cancer (radiology or pathology) are discussed at Multidisciplinary Team Meeting (MDM). To ensure that all junior doctors are aware that all patients with lung cancer must be discussed at MDM.	Respiratory RIE: AA WGH: SJH: FIOB
	For QPI review: to include in numerator 'patients requiring emergency oncology treatment but later discussed at MDM'	Formal Review: 2nd Cycle
QPI 2 (i)	Pathological diagnoses: to audit a random blinded selection of patients to ascertain why no pathology has been obtained: requirement for respiratory & radiology input. To delineate between where biopsy would have no impact on outcome e.g. Performance Status (PS) 3-4 versus technically difficult vs. biopsy attempted but failed.	
QPIs 10 & 12(i)	**Small Cell Lung Cancer (SCLC):** to look at timelines from referral to pathological diagnosis and oncological opinion.	MJM
QPI 14	**SABR:** Clinical oncology peer review to ensure consistency of SABR versus conventional radiotherapy (this is now in place).	
QPI 13 **30- & 90-Day Mortality**	To discuss and find ways to improve communication links between primary and secondary care surrounding accessing information about cause of death, in particular for patients who die at home/in the community.	SCAN Lung Group
	For QPI review: to separate biological therapy into Tyrosine Kinase Inhibitor (TKI) (tablets) and Immuno-Oncology (IO) (immunotherapy vaccine) therapy	Formal Review: 2nd Cycle
QPI 15 (i), (ii) & (iii)	Pathological diagnosis before curative treatment: Peer review required to ascertain whether all or some of these cases might have had different outcomes depending on who is undertaking/not undertaking biopsy: to explore the notion of 'bravery' versus a more conservative approach to biopsy.	
QPI 16	**Patients with N2 disease (ipsilateral mediastinal lymph node involvement) who are having curative treatment should have a CT Head prior to treatment:** continuation from 2017 Actions and use 'reminder' at MDM to ensure all appropriate patients are referred for CT Head.	
QPI 17	**Clinical Trials:** continuation from 2017 Actions - SCAN clinicians should 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 2018 to improve access to clinician driven realistic trials.	

Actions from 2017

QPI	Action required	Progress
QPI 2 (i)	Since the removal of Best Supportive Care (BSC) as exclusion (at Formal Review commencing for patients diagnosed from 1st Jan 2016) SCAN (and Scotland-wide) Health Boards consistently miss the target. Discussions, at the Scottish Lung Cancer Forum (SLCF) meeting in Glasgow in 2017 and at SCAN Sign Off, 6th Sept 2018 support reinstating BSC as an appropriate exclusion and perhaps adopting PS 4 as a further exclusion. It is viewed as inappropriate/not best practice to biopsy patients who are not fit (poor PS) or, for those with significant comorbidities whose treatment management is likely supportive care only.	Ongoing; QPI Review scheduled for 26 November 2019
QPI 2 (ii)	Numerator: Number of patients with a pathological diagnosis of Non-Small Cell Lung Cancer (NSCLC) who have a tumour **subtype** identified. Code 31 *Combination of non-small cell components* is not included in the measurability document. This category includes adenosquamous and other mixed NSCLC-type cases and should be included as a sub-type within this QPI. This omission is to be raised at the next lung cancer QPI Review and an amendment will be requested.	Ongoing; QPI Review scheduled for 26 November 2019
QPI 11 (i) & (ii)	Systemic Anti-Cancer Therapy (SACT) data guidelines were discussed at length at the SCAN QPI Report Sign Off meeting, 6th September 2018 and the requirement for more detailed information to be made available to audit staff. TKIs, immunotherapy and several other upcoming treatments are set to become routine for NSCLC. It was suggested that detailed treatment information be taken to the next Review for inclusion in the Lung Cancer QPI Data Set Definitions so that audit have the tools and knowledge to ensure SACT data is reported as complete and accurate. It was agreed at the SCAN Lung Group Meeting, 15 February 2019 to introduce a new agenda item "Oncology" which will inform the group of any new oncology treatments and chemotherapy agents which will additionally inform audit data entry.	Ongoing; QPI Review scheduled for 26 November 2019
QPI 13.1	30 DAY MORTALITY: Point to raise at Review: reporting appropriate end of treatment dates for biological therapy treatment: Query 412 (from 2014 and still in use) NHS Grampian asked: *What would the treatment completed date be for patients on biological treatment e.g. Erlotinib as it is not strictly given in cycles but re-prescribed on a regular basis.* ISD advised: *The advice that has been agreed is that for Erlotinib the date ended should be recorded as inapplicable*. Recently ChemoCare has changed and we can only prescribe 30 days at a time of the -ib tablets so we know the patient CANNOT be on treatment 30 days after the last prescription. Suggest take to Review.	Ongoing; QPI Review scheduled for 26 November 2019

QPI	Action required	Progress
QPI 15 (i), (ii) & (iii)	QPI 15 (cytology/histology before radical treatment) is new to our reporting programme. The target has been set at 75% for all 3 modalities: surgery, radical radiotherapy & chemoradiotherapy. At the SCAN Sign Off meeting it was noted that the results appeared somewhat disappointing for surgery and radical radiotherapy. Concern was voiced as to why the target was not lower for radical radiotherapy given that these patients are not fit for surgery and; should therefore be subject to different criteria and scrutiny. Quite a large number of patients are also referred to surgery without pathology when lesions are too small or inaccessible to biopsy; the patient aware that the lesion may be malignant or benign prior to resection. Additionally, 100% histology would be expected prior to chemoradiotherapy: chemotherapy treatment choices are determined by histological diagnoses. It was agreed that a request for amendment should be submitted at Review. Targets should not be the same for all three modalities.	Ongoing; QPI Review scheduled for 26 November 2019
QPI 16	Disappointing results. Procedures to be tightened up: these CT or MRI scans should be requested by respiratory medicine as part of the patient's pathway (prior to treatment) when N2 disease has been identified for NSCLC patients who are going on to have curative treatment. An MDM 'reminder' was suggested, similar to that for TNM (Tumour, Node, Metastasis staging) & PS, so that these requests become common place.	Changes were implemented mid to late 2018. It is anticipated that improvements will become more apparent in 2019 results and QPI 16, therefore, is retained as part of the Action Plan for 2018.
Clinical Trials	SCAN clinicians should ensure that they register trials with the Scottish Cancer Research Network (SCRN). SCRN should share their lists of current open trials between the Networks to allow the possibility of cross network trial access. Note: Clinical trial targets remain challenging due to stringent entry criteria for many trials.	Although clinical trials for patients diagnosed with lung cancer remain challenging due to stringent entry criteria; ongoing efforts by clinical staff will ensure that all appropriate patients are included in trials.

Lung Cancer QPI Attainment Summary 2018			Target %	Borders		D&G		Fife		Lothian		SCAN	
QPI 1 MDT discussion before definitive treatment			95	N D	-%	N 141 D 143	98.6%	N 315 D 331	95.2%	N 614 D 692	88.7%	N 1070 D 1166	91.8%
QPI 2 Pathological Diagnosis	All patients with lung cancer		80	N D	-%	N 83 D 137	60.6%	N 205 D 326	62.9%	N 443 D 686	64.6%	N 731 D 1149	63.6%
	NSCLC with sub-type identified		90	N D	-%	N 69 D 70	98.6%	N 152 D 167	91.0%	N 331 D 357	92.7%	N 552 D 594	92.9%
	Non squamous IIIB-IV: molecular profiling		75	N D	-%	N 26 D 32	81.3%	N 66 D 82	80.5%	N 121 D 143	84.6%	N 213 D 257	82.9%
QPI 4 Patients being treated with curative intent who have a PET/CT before treatment			95	N D	-%	N 27 D 28	96.4%	N 61 D 66	92.4%	N 163 D 167	97.6%	N 251 D 261	96.2%
*QPI 6 Surgical resection in NSCLC patients	All NSCLC		20	N D	-%	N 16 D 68	23.5%	N 33 D 155	21.3%	N 88 D 355	24.8%	N 137 D 578	23.7%
	NSCLC Stage I-II		60	N D	-%	N 14 D 19	73.7%	N 32 D 36	88.9%	N 75 D 108	69.4%	N 121 D 163	74.2 %
*QPI 7 Lymph node assessment for NSCLC patients having pneumonectomy or lobectomy			80	Analysis is by Hospital of Surgery: RIE						N 121 D 151	80.1%	N D	n/a
QPI 8 Radiotherapy (including SABR) for inoperable lung cancer			35	N D	-%	N 14 D 48	29.2%	N 56 D 113	49.6%	N 117 D 268	43.7%	N 187 D 429	43.6%
QPI 9 Chemoradiotherapy for locally advanced NSCLC			50	N D	-%	N 2 D 2	100%	N 4 D 6	66.7%	N 4 D 15	26.7%	N 10 D 23	43.5%
QPI 10 Chemoradiotherapy for Limited stage SCLC			70	N D	-%	N 0 D 1	0.0%	N 3 D 4	75.0%	N 4 D 10	40.0%	N 7 D 15	46.7%
QPI 11 SACT for patients with inoperable NSCLC	All types of SACT for NSCLC		35	N D	-%	N 24 D 47	51.1%	N 64 D 124	51.6%	N 92 D 255	36.1%	N 180 D 426	42.3%
	Biological therapy for NSCLC stage IIIB-IV, PS 0-1		60	N D	N/A	N 3 D 3	100%	N 3 D 3	100%	N 11 D 15	73.3%	N 17 D 21	81.0%
QPI 12 SACT for patients with SCLC	All types of chemotherapy for SCLC		70	N D	-%	N 7 D 10	70.0%	N 25 D 34	73.5%	N 38 D 65	58.5%	N 70 D 109	64.2%
	Palliative chemotherapy for SCLC patients having treatment with non-curative intent		50	N D	-%	N 6 D 10	60.0%	N 19 D 28	67.9%	N 32 D 58	55.2%	N 57 D 96	59.4%

Lung Cancer QPI Attainment Summary 2018		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 5 D 188 2.7%	N D n/a
	Radical Radiotherapy	<5	N D -%	N 0 D 11 0.0%	N 1 D 44 2.3%	N 2 D 101 2.0%	N 3 D 156 1.9%
	Adjuvant Chemotherapy	<5	N D -%	N 0 D 3 0.0%	N 0 D 2 0.0%	N 0 D 14 0.0%	N 0 D 19 0.0%
	Chemoradiotherapy	<5	N D -%	N 0 D 4 0.0%	N 1 D 21 4.8%	N 0 D 29 0.0%	N 1 D 54 1.9%
	Palliative Chemotherapy (NSCLC)	<10	N D -%	N 1 D 13 7.7%	N 2 D 32 6.3%	N 4 D 39 10.3%	N 7 D 84 8.3%
	Palliative Chemotherapy (SCLC)	<15	N D -%	N 0 D 6 0.0%	N 4 D 19 21.1%	N 4 D 33 12.1%	N 8 D 58 13.8%
	Biological Therapy (NSCLC)	<10	N D -%	N 1 D 10 10.0%	N 6 D 16 37.5%	N 0 D 39 0.0%	N 7 D 65 10.8%
*QPI 13.2 90 Day Mortality After Treatment	*Surgery	<5	Analysis is by Hospital of Surgery: RIE			N 9 D 201 4.5%	N D n/a
	Radical Radiotherapy	<5	N D -%	N 1 D 11 9.1%	N 2 D 44 4.5%	N 6 D 101 5.9%	N 9 D 156 5.8%
	Chemoradiotherapy	<5	N D -%	N 0 D 1 0.0%	N 2 D 20 10.0%	N 0 D 29 0.0%	N 2 D 50 4.0%
QPI 14 SABR for Inoperable Lung Cancer with Stage I Disease		35	N D -%	N 0 D 4 0.0%	N 15 D 39 38.5%	N 27 D 90 30.0%	N 42 D 130 32.3%
QPI 15 Cytological/Pathological Diagnosis Prior to Treatment	Surgery	75	N D -%	N 10 D 17 58.8%	N 19 D 36 52.8%	N 75 D 100 75.0%	N 104 D 153 68.0%
	Radical Radiotherapy	75	N D -%	N 8 D 11 72.7%	N 18 D 44 40.9%	N 64 D 100 64.0%	N 90 D 155 58.1%
	Chemoradiotherapy	75	N D -%	N 4 D 4 100%	N 22 D 22 100%	N 29 D 29 100%	N 55 D 55 100%
QPI 16 Contrast CT/MRI for N2 Pts Prior to Curative Treatment		95	N D -%	N 4 D 4 100%	N 7 D 19 36.8%	N 32 D 39 82.1%	N 43 D 62 69.4%

Lung Cancer QPI Attainment Summary 2018	Target %	Borders	D&G	Fife	Lothian	SCAN
Clinical Trials N=patients consented to trials/research and held on SCRN database. D= 5year average from Cancer Registry	15	N n/a D	N 0 n/a D 0	N 0 n/a D 0	N 9 1.2% D 769	N 9 0.7% D 1358

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.

Introduction and Methods

Cohort

This report presents analyses of data collected on lung cancer patients who are newly diagnosed with lung cancer between 01 January 2018 and 31 December 2018 and who were treated in one of the four constituent health board areas; comprising South East Scotland Cancer Network (SCAN) – Borders, Dumfries & Galloway (D&G), Fife, Lothian and the Cancer Centre in Edinburgh (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

QPIs have been developed collaboratively with the three Regional Cancer Networks; Information Services Division, Scotland (ISD); and Healthcare Improvement Scotland (HIS). QPIs will be kept under regular review and be responsive to changes in clinical practice and emerging evidence.

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

QPI reporting for patients diagnosed with lung cancer was implemented from 01/04/2013; and this is the sixth publication of QPI results for lung cancer patients diagnosed in the SCAN region.

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.	

[1] QPI documents are available at www.healthcareimprovementscotland.org
[2] Datasets and measurability documents are available at www.isdscotland.org

Audit Process
Data was analysed by the audit facilitators in each NHS board according to the measurability documentation provided by ISD. SCAN data was collated by Ailsa Patrizio, SCAN Audit Facilitator for Lung Cancer.

Patients are mainly identified through registration at weekly multi-disciplinary meetings (MDMs), and through checks made against pathology listings, General Register Office (GRO) records, and the Lung Cancer Nurse Specialist (LCNS or CNS) database. Oncology data is available electronically via ARIA Varian and other Department of Clinical Oncology databases.

Patients living closer to either Dundee or Carlisle may opt to have 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).

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 Jane Gysin	Laura Allan
NHS Fife	Queen Margaret Hospital (QMH) Victoria Hospital (VHK)	Dr Iain Murray	Mimi Bjelorgrlic
NHS Lothian	Royal Infirmary of Edinburgh (RIE) Western General Hospital (WGH) St John's Hospital (SJH)	Dr K Skwarski	Ailsa Patrizio
SCAN & NHS Lothian	Edinburgh Cancer Centre (ECC)	Dr Colin Barrie	

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 6.

Data Quality

Scottish Cancer Registry Incidence

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 will, however, be subject to a small amount of variation. The 'year' in Audit is based on the date of diagnosis whereas cancer registration defines their cohort based on the date the patient first became known to secondary health service.

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 2018) 1304 patients were diagnosed with lung cancer (ICD-codes: C33, C34) in the SCAN region.

Number of patients recorded in audit:

patients diagnosed 01/01/2018 to 31/12/2018

	Borders	D&G	Fife	Lothian	SCAN
Number of cases in audit cohort	111	146	342	705	1304

NHS Borders have identified 111 patients as diagnosed with lung cancer in 2018. The number of patients identified is undisputable but changes in local circumstances, outwith full scrutiny, have unfortunately contributed to a small degree of erroneous data. Discussions at SCAN level have focused on assured high quality lung cancer data which has been collected and reported over the years; pre- and post-QPI implementation. Patients diagnosed in NHS Borders have therefore been removed from the analyses in 2018 pending in-house data checks and clarification prior to the publication of local results. NHS Borders 2018 data will be reported fully in next year's QPI lung cancer report.

Estimate of case ascertainment: calculated using the average of the most recent available 5 years of Cancer Registry data (2013-2017).

	Borders	D&G	Fife	Lothian	SCAN
Number of cases from audit	111	146	342	705	1304
Cases from Cancer Registry (2014-2016)	97	147	345	769	1358
Case Ascertainment	**114.4%**	**99.3%**	**99.1%**	**91.7%**	**96.0%**

Source: Scottish Cancer Registry, ISD. Data extracted from ACaDMe: 19/08/2019

Quality Assurance

All hospitals in the region participate in the Quality Assurance (QA) programme provided by ISD Scotland. QA of the Lung data was carried out in November 2014 (2013 data) and the results show that the SCAN region is performing inline with the Scottish average. The next lung cancer QA is scheduled for 2020/21.

	Borders	D&G	Fife	Lothian	Scotland
Accuracy of data recording (%)	99.4	99.0	99.5	98.8	99.5

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 from SCAN Health Boards 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 19th September 2019, at which point clinical recommendations were agreed.
- The final draft, complete with agreed amendments from the Sign-off meeting on 19th September 2019, was circulated to the SCAN Lung Group on 21st November 2019 for final comments.
- The Final report was circulated to the SCAN Lung Group, Clinical Governance Groups and SCAN Action Plan Board Leads on 6th December 2019.
- 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.

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 before definitive treatment.

Denominator = All patients with lung cancer.

Exclusions = Patients who died before first treatment.

Target 95%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI[3]		3	11	13	27
Numerator		141	315	614	1070
Not recorded for numerator		0	0	0	0
Denominator		143	331	692	1166
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	0	0
% Performance	**-**	**98.6%**	**95.2%**	**88.7%**	**91.8%**

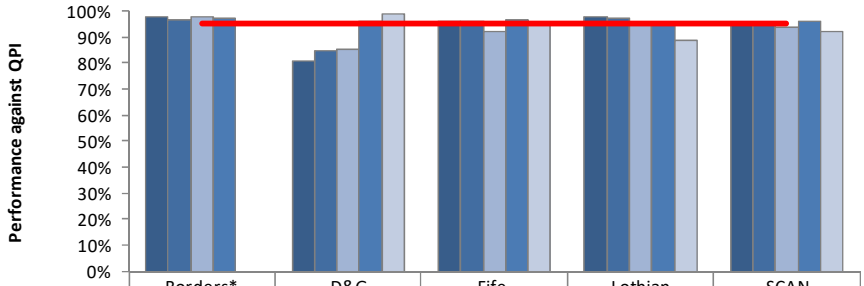
Comments

The target was met by NHS D&G and Fife. Finalised NHS Borders data is awaited.

NHS Lothian: The target was not met with a shortfall of 6.3% (78 cases). These come under two distinct groups: (1) patients who have urgent radiotherapy prior to being discussed at MDM, i.e. for spinal cord compression, compromised airways, and other urgent medical conditions. (2) those patients who are not brought to MDM. There are a high proportion of patients who attend through A&E and are admitted to various specialties, for example, MoE, General Medicine, and/or Respiratory. These are often older, frail patients with significant comorbidities and/or advanced disease. They are often not fit for invasive procedures and ultimately a pathological diagnosis would not alter treatment management. Decisions made on the ward are generally for BSC and MDM discussion often doesn't take place.

While it is possible for treatment decisions to be made prior to MDM, most of these are later ratified at subsequent MDMs to ensure that all patients are appropriately managed. Urgent indication of treatment, as described in (1) above represents good practice and should take priority as appropriate. Action is, however, required to promote a change of practice for those who fall into Group (2) i.e. those patients who are admitted under or seen by specialties other than respiratory and, who are currently not brought to MDM for discussion. Work is underway to address the disparity in NHS Lothian by ensuring that ALL patients are brought to MDM, regardless of point of entry or speciality seen by (see Action Plan 2018).

QPI 1: Multidisciplinary Team Meeting
2014 - 2018



	Borders*	D&G	Fife	Lothian	SCAN
2014-15	97.7%	80.8%	95.9%	97.7%	95.1%
2015	96.8%	84.8%	96.0%	97.0%	95.4%
2016	97.4%	85.1%	92.2%	95.4%	93.5%
2017	97.0%	95.8%	96.6%	95.6%	96.0%
2018		98.6%	95.2%	88.7%	91.8%
Target	95%	95%	95%	95%	95%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

[3] Ineligible for analysis refers to those cases where data does not meet the denominator criteria; the ineligible figure, in addition, includes relevant exclusions (e.g. died before treatment) as laid out in QPI definitions.

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).

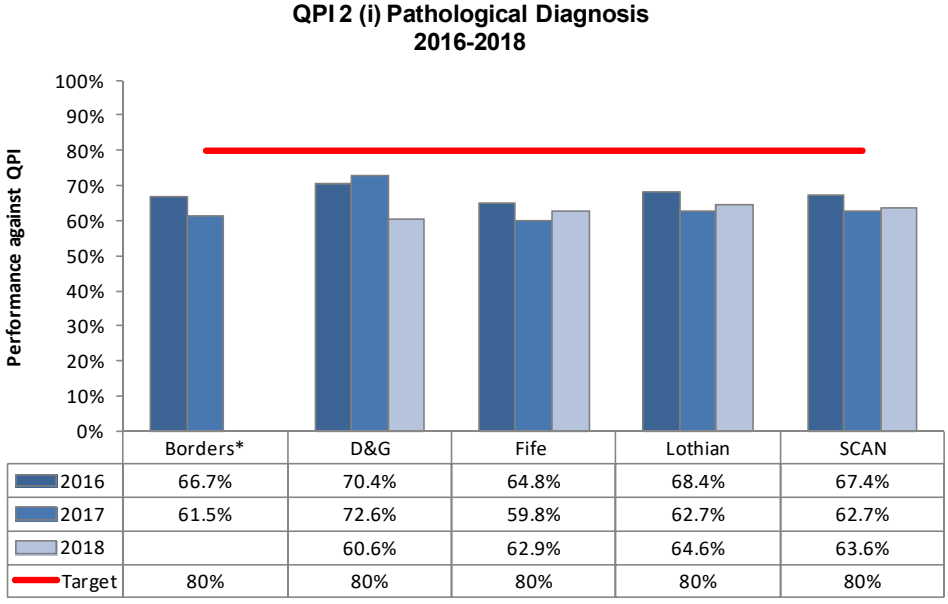
Denominator = All patients with lung cancer.

Exclusions = Patients who decline investigations or surgical resection.

Target 80%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI		9	16	19	44
Numerator		83	205	443	731
Not recorded for numerator		0	0	0	0
Denominator		137	326	686	1149
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	0	0
% Performance	**-**	**60.6%**	**62.9%**	**64.6%**	**63.6%**

Comments

When this QPI was originally developed patients *receiving (best) supportive care* were excluded. At Formal Review it was agreed to remove this exclusion and additionally to increase the target from 75% to 80%. Consequently, targets have been consistently missed locally and regionally as evidenced in the 2018 results above (finalised NHS Borders data is awaited) and across the 3 years of reporting since; illustrated in the chart below.



	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		60.6%	62.9%	64.6%	63.6%
Target	80%	80%	80%	80%	80%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

SCAN consultants support the decision to exclude BSC patients although propose that it may be more appropriate to exclude patients with PS 4. The level of target is likely unsuitable and should also be reconsidered at the next review.

Analyses have demonstrated that many patients, where the target was missed, cannot undergo invasive investigations due to poor fitness levels and/or comorbidities. Treatment choices can be limited in this group and, indeed, invasive procedures have been shown not to alter outcomes for this group; whose treatment management is likely supportive care only. Other reasons why no tissue diagnosis could be obtained were attempted but negative biopsy results or of the location of the tumour, making biopsy possible or not. SCAN have agreed to undertake a random, blinded review of some of the 450 patients who did not have tissue diagnosis in 2018 with peer review to see if there is any variation of practice between colleagues and health boards (see Action Plan 2018).

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

Numerator = Number of patients with a pathological diagnosis of NSCLC[4] who have a tumour sub-type identified.[5]

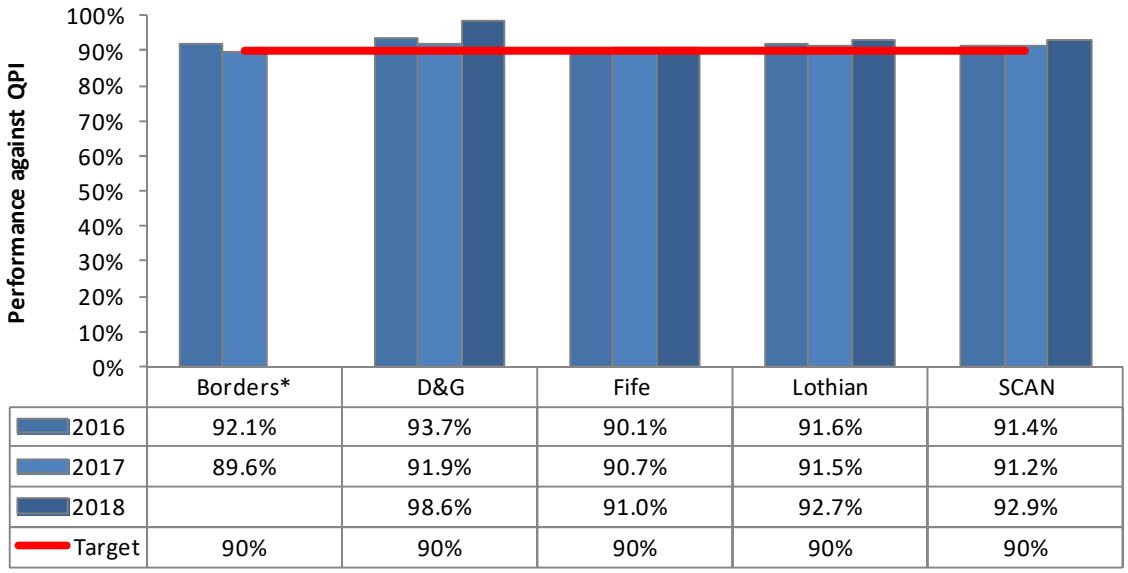
Denominator = All patients with a pathological diagnosis of NSCLC (no exclusions).

Target 90%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI		76	175	348	599
Numerator		69	152	331	552
Not recorded for numerator		0	0	0	0
Denominator		70	167	357	594
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	0	0
% Performance	**-**	**98.6%**	**91.0%**	**92.7%**	**92.9%**

Comments

The target was met by the 3 health boards reported. Finalised NHS Borders data is awaited.

QPI 2 (ii) Pathology of NSCLC: Sub-Type Reporting 2016-2018



	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		98.6%	91.0%	92.7%	92.9%
Target	90%	90%	90%	90%	90%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

The target was changed at Formal Review from 80% to 90% and took effect for patients diagnosed from 1st January 2016 onwards. The above table includes data from 2016 and shows the most recent 3-year reporting period.

[4] NSCLC = Squamous, Adenocarcinoma, NSCLC (Not Otherwise Specified, (NOS)) and Other Specific NSCLC. *QPI Measurability Document, Version 3.4*: ISD Scotland: March 2019

[5] 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.

2 (iii) Non-Squamous, Stage IIIB to IV: Molecular Profiling Analysis Target = 75%

Numerator = Number of patients with a pathological diagnosis of Stage IIIB, IIIC or IV non-squamous NSCLC who have molecular profiling[6] undertaken.

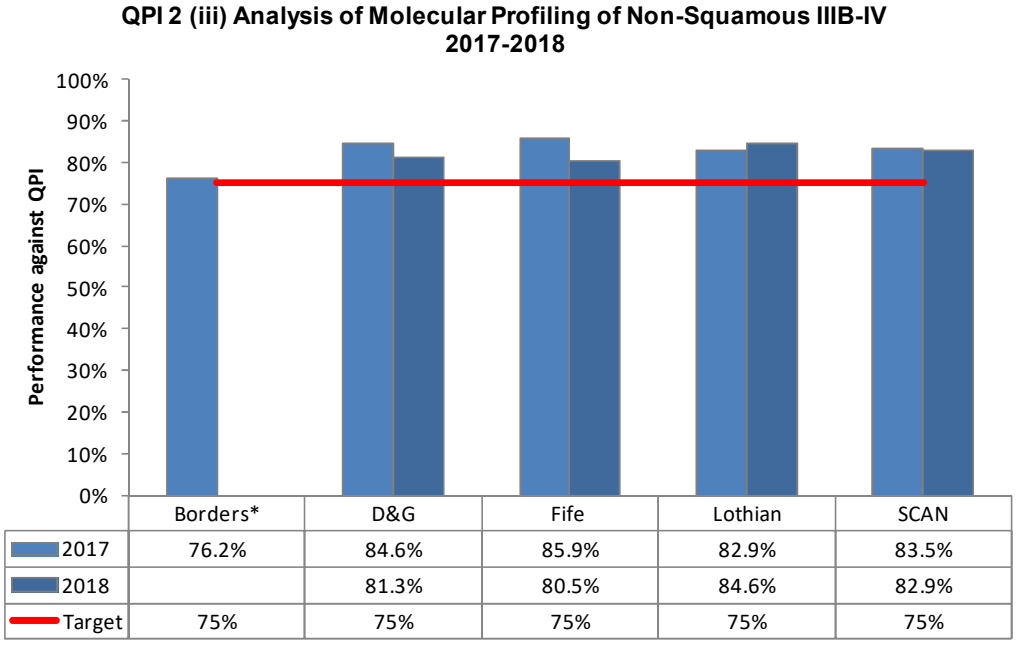
Denominator = All patients with a pathological diagnosis of non-squamous NSCLC, Stage IIIB, IIIC or IV.

Exclusions = Patients with PS 4

Target 75%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI		114	260	562	933
Numerator		26	66	121	213
Not recorded for numerator		0	0	0	0
Denominator		32	82	143	257
Not recorded for exclusions		2	2	3	7
Not recorded for denominator		0	0	3	3
% Performance	**-**	**81.3%**	**80.5%**	**84.6%**	**82.9%**

Comments

The target was met by the 3 health boards reported. Finalised NHS Borders data is awaited.



* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

The denominator was changed in 2016 from 'NSCLC patients with stage IIIB-IV' to 'non-squamous NSCLC, stage IIIB-IV'. In addition, molecular profiling was extended to include Oncogenic Anaplastic Lymphoma Kinase (ALK) and an accompanying new data field [ALK] which was introduced from 1st January 2017.

[6] QPI 2 (iii) reports on two types of molecular profiling: EGFR (Epidermal Growth Factor Receptor) and ALK (Oncogenic Anaplastic Lymphoma Kinase). It is acknowledged by the QPI Development and Review teams that there are several markers and other genetic mutations, for example ROS1 (a type of receptor tyrosine kinase) & PD-L1 (A protein found on T cells (a type of immune cell)). Developments and modifications will be continually reviewed going forward.

QPI 4 PET CT in Patients being treated with Curative Intent **Target 95%**

Numerator = Number of patients diagnosed with NSCLC who are treated with curative intent[7] who undergo PET CT[8] prior to start of treatment.

Denominator = All patients diagnosed with NSCLC who are treated with curative intent, (no exclusions).

Target 95%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI		118	276	538	932
Numerator		27	61	163	251
Not recorded for numerator		0	0	0	0
Denominator		28	66	167	261
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	0	0
% Performance	**-**	**96.4%**	**92.4%**	**97.6%**	**96.2%**

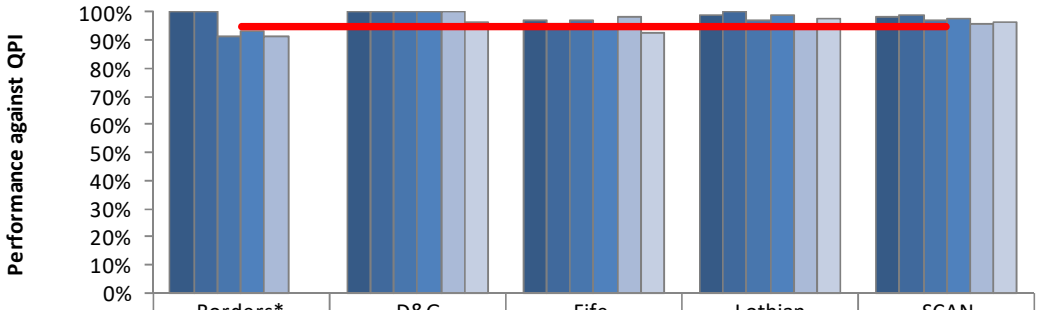
Comments

PET scanning is important in the management of NSCLC. It is appropriate in the investigation of solitary pulmonary nodules to determine malignant potential and is essential in the assessment of occult metastases in patients being considered for curative treatment.

The target was met by NHS D&G and Lothian in 2018. Finalised NHS Borders data is awaited.

NHS Fife: The target was not met with a shortfall of 2.6% (5 cases).
3 patients had PET scans in previous 'pathways' and were kept under surveillance by respiratory consultants. Follow up scans had detected growth and, these patients were referred directly (without further PET), 2 for surgical resection and 1 for chemoradiotherapy.
Another patient commenced chemotherapy, with palliative intent, therefore PET was not appropriate. The plan later changed and the patient received radical (curative) dose radiotherapy.
The 5th remaining patient did not undergo PET due to claustrophobia.

QPI 4 PET CT: NSCLC
2013-2018



	Borders*	D&G	Fife	Lothian	SCAN
2013-14	100.0%	100.0%	96.9%	98.9%	98.6%
2014-15	100.0%	100.0%	95.9%	100.0%	99.0%
2015	91.7%	100.0%	96.8%	97.2%	97.1%
2016	93.3%	100.0%	95.2%	98.8%	97.8%
2017	91.7%	100.0%	98.3%	95.2%	96.0%
2018		96.4%	92.4%	97.6%	96.2%
Target	95%	95%	95%	95%	95%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

Treatment Management

[7] Curative Intent/Treatment = Surgical Resection, Radical Radiotherapy (including SABR) or Chemoradiotherapy.
[8] PET CT (Positive Emissions Tomography) scan and CT (Computerised Tomography).

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.

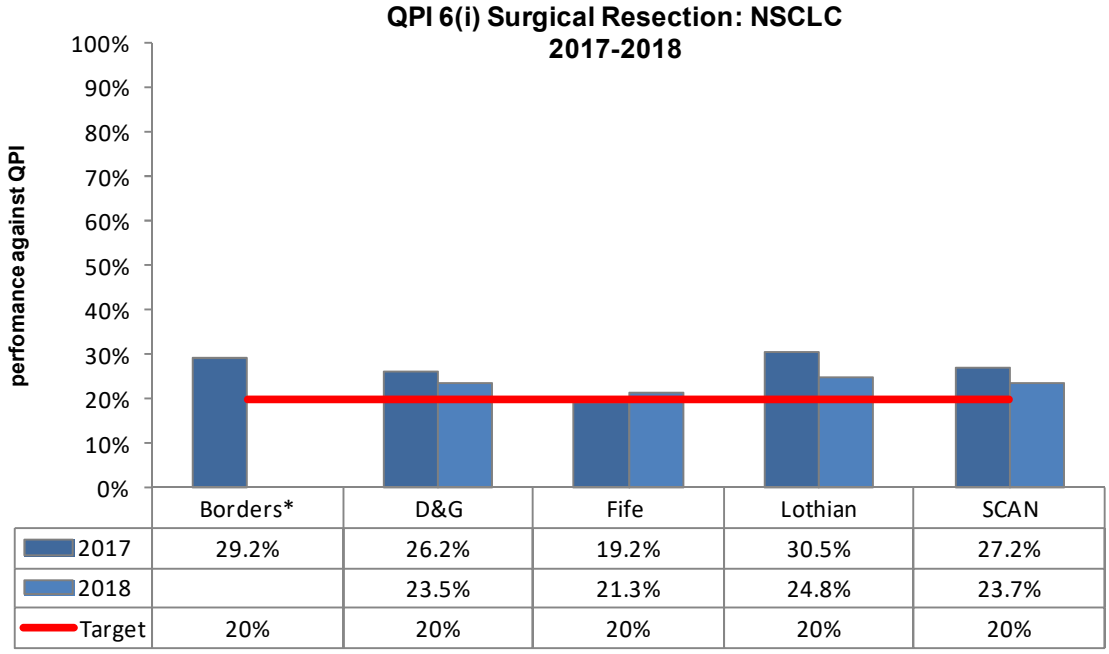
Denominator = All patients with NSCLC.

Exclusions = Patients who undergo SABR[9], who decline surgery or who die before surgery

Target 20%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI		78	187	350	615
Numerator		16	33	88	137
Not recorded for numerator		0	0	0	0
Denominator		68	155	355	578
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	0	0
% Performance	**-**	**23.5%**	**21.3%**	**24.8%**	**23.7%**

Comments

The target was met by the 3 health boards reported. Finalised NHS Borders data is awaited.



* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

QPI 6 (i) was amended with effect from 1st January 2017. The target was raised from 17% to 20% and an additional exclusion '*patients who undergo SABR*' was applied. Consequently only two years of data is shown.

[9] SABR: Stereotactic Ablative Radiotherapy

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

Numerator = Number of patients with NSCLC, Stage I-II[10] who undergo surgical resection.

Denominator = All patients with NSCLC, Stage I-II only.

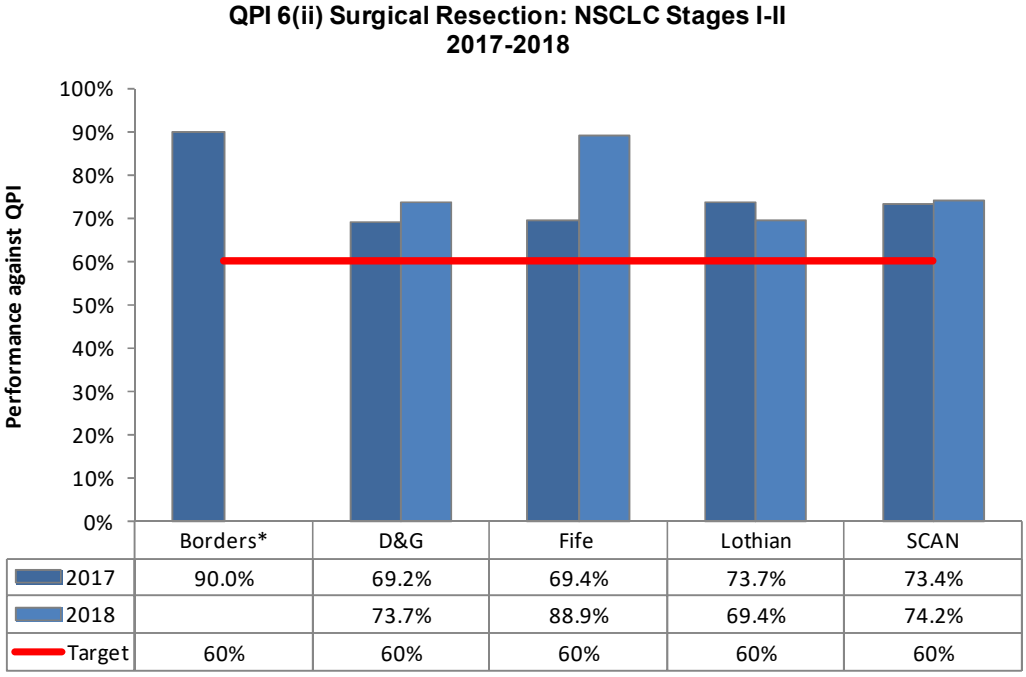
Exclusions = Patients who decline surgery, who die before surgery or who undergo SABR.

Target 60%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI		127	306	594	1027
Numerator		14	32	75	121
Not recorded for numerator		0	0	0	0
Denominator		19	36	108	163
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	3	3
% Performance	**-**	**73.7%**	**88.9%**	**69.4%**	**74.2%**

Comments

The target was met by the 3 health boards reported. Finalised NHS Borders data is awaited. Improvements were noted in NHS D&G, and are likely as a consequence of the introduction of consistent and regular surgical input at MDM.

While 60% compliance may appear a rather low aspiration; the tolerance of 40% has been figured into this QPI to account for patients who are borderline candidates or those deemed too high risk for surgery. Those of poor fitness or comorbidities might be offered radical radiotherapy, including SABR (although SABR is in fact excluded from this QPI); while for others, poor fitness or medical frailty might preclude active treatment altogether. All patients are discussed fully at MDM so that all approaches are considered and to ensure that all proper processes take their course.



* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

QPI 6 (ii) was amended with effect from 1st January 2017. The target was raised from 50% to 60% and an additional exclusion '*patients who undergo SABR*' was applied. Consequently only two years data is shown.

[10] 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%	2018	2017
Numerator	121	137
Not recorded for numerator	14	0
Denominator*	151	165
Not recorded for exclusions	0	0
Not recorded for denominator	0	0
% Performance	**80.1%**	**83.0%**

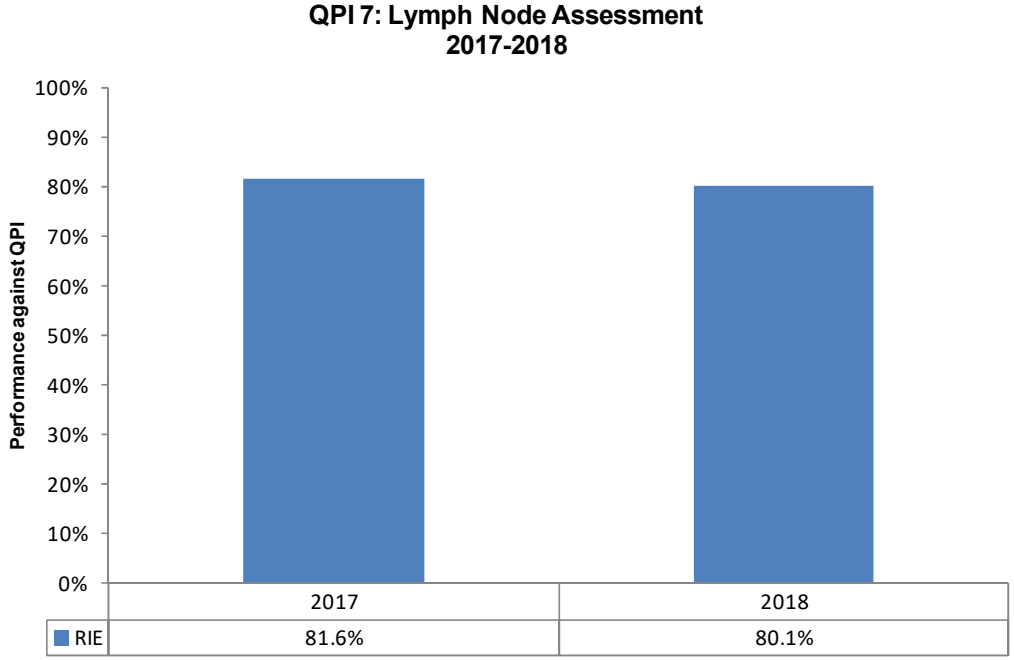
* The denominator includes 43 (2018) and 32 (2017) patients who were diagnosed in NHS Tayside and had surgery at RIE. Patients from NHS D&G (15 patients) are not included; they have surgery at the Golden Jubilee Hospital, Clydebank and are reported by WOSCAN.

QPI 7 is analysed by *Hospital of Surgery* 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 Board who referred patients (often outwith their HB area) for surgical resection.

Patients diagnosed in NHS Borders have been removed from the analysis in 2018 pending in-house data checks before publication of their results.

Comment

The target was exceeded in 2017 and 2018; no action is required.



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

Numerator = Number of patients with lung cancer not undergoing surgery who receive radical radiotherapy[11] +/- chemotherapy, or SABR.

Denominator = All patients with lung cancer not undergoing surgery.

Exclusions = Patients with SCLC, patients who decline radiotherapy, patients who die prior to treatment and patients with stage IV disease.

Target 35%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI		98	229	437	764
Numerator		14	56	117	187
Not recorded for numerator		0	0	0	0
Denominator		48	113	268	429
Not recorded for exclusions		10	1	27	38
Not recorded for denominator		0	0	0	0
% Performance	**-**	**29.2%**	**49.6%**	**43.7%**	**43.6%**

Note: Patients "not recorded for exclusions" are those who do not have their M stage documented and, as such, it is impossible to assess their cancer as stage IV or as any other stage. These patients, however, are retained in the denominator and are shown under 'Not recorded for exclusion' for information purposes.

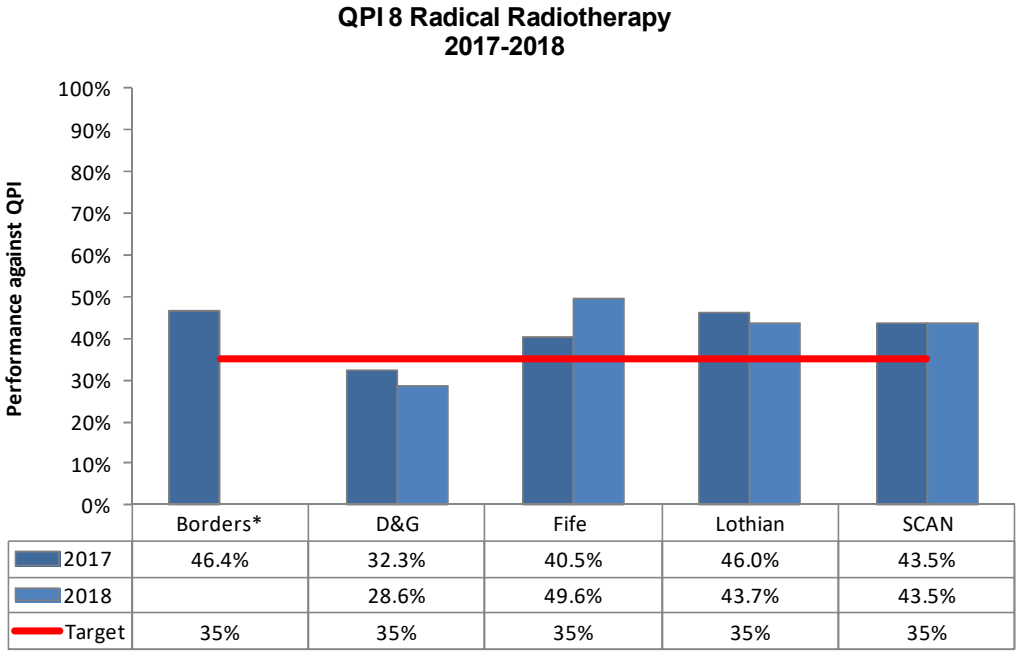
Comments

The target was met by NHS Fife and Lothian. Finalised NHS Borders data is awaited.

NHS D&G: The target was not met with a shortfall of 5.8% (34 cases). Of the 34 patients, 22 were unfit and/or had a variety of comorbidities while a further 4 patients had specific documented comorbidities only. Radical radiotherapy could not be given to 1 patient due to their large volume of disease which was too great to be encompassed within the radiotherapy field. Another 3 patients declined treatment, although not specifically radiotherapy, and are therefore included in this QPI. Of these 3 patients, 2 were not seen by oncology; and 1 patient who was not fit enough to receive radiotherapy at the time of initial appointment unfortunately died before their review appointment booked for 2 months later. The remaining 4 patients died before oncology discussion.

Treatment management choices can be more limited in a rural health board such as D&G, which covers a substantial geographical area. The impact and challenges that travel has on patients attending appointments in Edinburgh, Glasgow and Carlisle to undergo radiotherapy have to be measured against benefits and risks particularly regarding patients' fitness levels and co-morbid conditions pre-treatment.

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



	Borders*	D&G	Fife	Lothian	SCAN
2017	46.4%	32.3%	40.5%	46.0%	43.5%
2018		28.6%	49.6%	43.7%	43.5%
Target	35%	35%	35%	35%	35%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

At Formal Review it was agreed to increase the target to 35% and to include the relatively recent treatment SABR (Stereotactic Ablative Radiotherapy) as part of the criteria for the numerator. A new data field [SABR] was introduced to the lung cancer data set from 1st January 2017. The chart therefore shows 2 years of analyses only.

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

Numerator = Number of patients with NSCLC, Stage IIIA[12] and PS 0-1, not undergoing surgery and who receive Chemoradiotherapy[13]

Denominator = All patients with NSCLC, Stage IIIA and PS 0-1 not undergoing surgery who receive radical radiotherapy[14]

Exclusions = Patients who decline treatment, patients who die before treatment, patients who receive Continuous Hyperfractionated Radiotherapy (CHART).

Target 50%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI		144	336	688	1168
Numerator		2	4	4	10
Not recorded for numerator		0	0	0	0
Denominator		2	6	15	23
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	2	2
% Performance	**-**	**100.0%**	**66.7%**	**26.7%**	**43.5%**

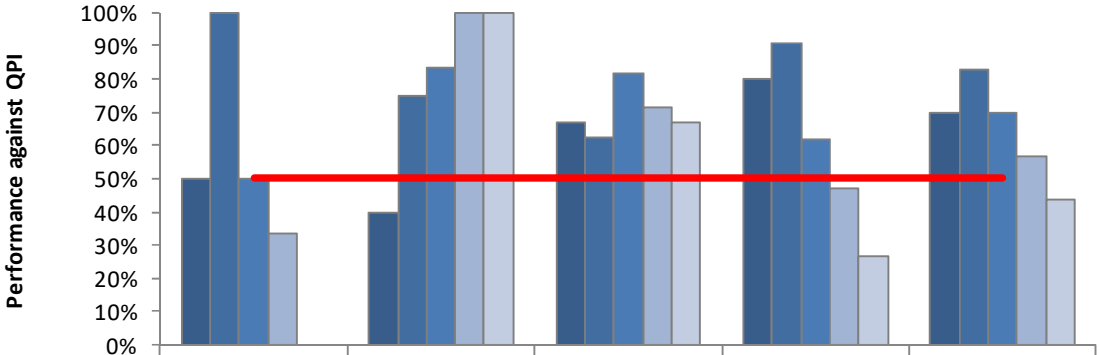
Comments

The target was met by NHS D&G and Fife. Finalised NHS Borders data is awaited.

NHS Lothian: The target was not met with a shortfall of 23.3% (11 cases). The 11 stage IIIA cases where chemoradiotherapy was not given were reviewed in detail. Chemotherapy was contraindicated for 7 patients due to comorbidities. In another 2 patients fitness levels were questionable and the decision was made at oncology assessment to preclude chemotherapy. The remaining 2 patients both had more than one tumour and therefore not suitable for chemotherapy. The risks of adding chemotherapy outweighed the benefits for all of the 11 patients who were instead treated with radical radiotherapy. No action is required.

In reviewing the results shown here, allowance should be made where small numbers and variation may be due to chance.

QPI 9 Chemoradiotherapy: NSCLC Stage IIIA 2014-2018



	Borders*	D&G	Fife	Lothian	SCAN
2014-15	50.0%	40.0%	66.7%	80.0%	70.0%
2015	100.0%	75.0%	62.5%	90.5%	82.9%
2016	50.0%	83.3%	81.8%	61.9%	70.0%
2017	33.3%	100.0%	71.4%	47.1%	56.7%
2018		100.0%	66.7%	26.7%	43.5%
Target	50%	50%	50%	50%	50%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

[12] Stage IIIA NSCLC includes: T1a-c N2 M0; T1b N2; T2a-b N2M0; T3 N1 M0; T4 N0-1 M0.
[13] NSCLC Chemoradiotherapy: radiotherapy ≥ 54Gy and concurrent or sequential chemotherapy.
[14] 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-IIIB[15] and PS 0-1 who receive Chemoradiotherapy[16]

Denominator = All patients with SCLC, Stage I-IIIB and PS 0-1

Exclusions = Patients who decline treatment, patients who die before treatment, and patients who undergo surgical resection

Target 70%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI		145	338	693	1176
Numerator		0	3	4	7
Not recorded for numerator		0	0	0	0
Denominator		1	4	10	15
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	2	2
% Performance	**-**	**0.0%**	**75.0%**	**40.0%**	**46.7%**

Comments

While the target was met by NHS Fife the effects of small numbers cannot be ignored. Results can be distorted positively and negatively, particularly evidenced in the results for NHS Lothian and of the solitary patient in the denominator in D&G. Aggregation of results over time can help to clarify outcomes where numbers are small:

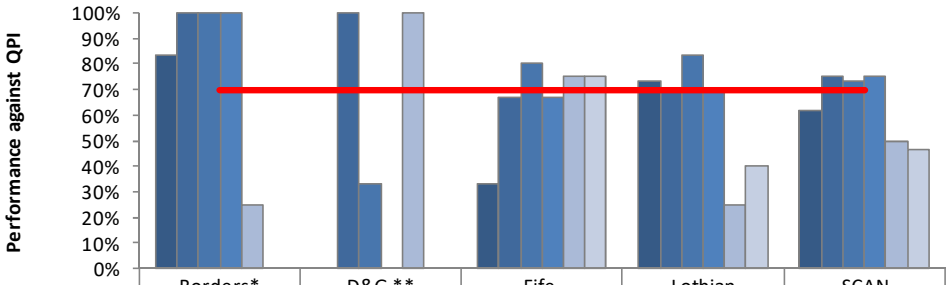
Aggregated Results	Borders	D&G	Fife	Lothian
Aggregated over 5 years[17]	76.9%	72.7%	72.0%	59.6%

NHS D&G: The target was not met with a shortfall of 70% (1 case). The patient had pulmonary fibrosis which contraindicates radiotherapy. The patient was treated with palliative chemotherapy.

NHS Lothian: The target was not met with a shortfall of 30% (6 cases). Treatment plans had to be changed for 5 of the 6 patients due to increased levels of confusion, clinical deterioration and cancer progression. Questionable fitness precluded chemotherapy for the remaining patient.

Finalised NHS Borders data is awaited.

QPI 10 Chemoradiotherapy: Limited SCLC 2013-2018



	Borders*	D&G **	Fife	Lothian	SCAN
2013-14	83.3%	0.0%	33.3%	73.3%	62.1%
2014-15	100.0%	100.0%	66.7%	70.0%	75.0%
2015	100.0%	33.3%	80.0%	83.3%	73.3%
2016	100.0%	0.0%	66.7%	69.2%	75.0%
2017	25.0%	100.0%	75.0%	25.0%	50.0%
2018		0.0%	75.0%	40.0%	46.7%
Target	70%	70%	70%	70%	70%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.
**D&G 2013/14: the target was not met when 0 out of 2 patients received chemoradiotherapy; similarly in 2018 where the result was 0 out of 1 patient. Conversely, in 2016 no patients met the denominator criteria and zero here represents "inapplicable".

[15] Patients with $T_xN_{1-3}M_0$ disease will be included within the measurement of this QPI.
[16] SCLC Chemoradiotherapy: radiotherapy ≥ 40Gy and concurrent or sequential platinum-based chemotherapy.
[17] Borders aggregated analysis covers a 4 year period only; data not currently available for NHS Borders for 2018.

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

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

Numerator = Number of patients with NSCLC not undergoing surgery who receive SACT

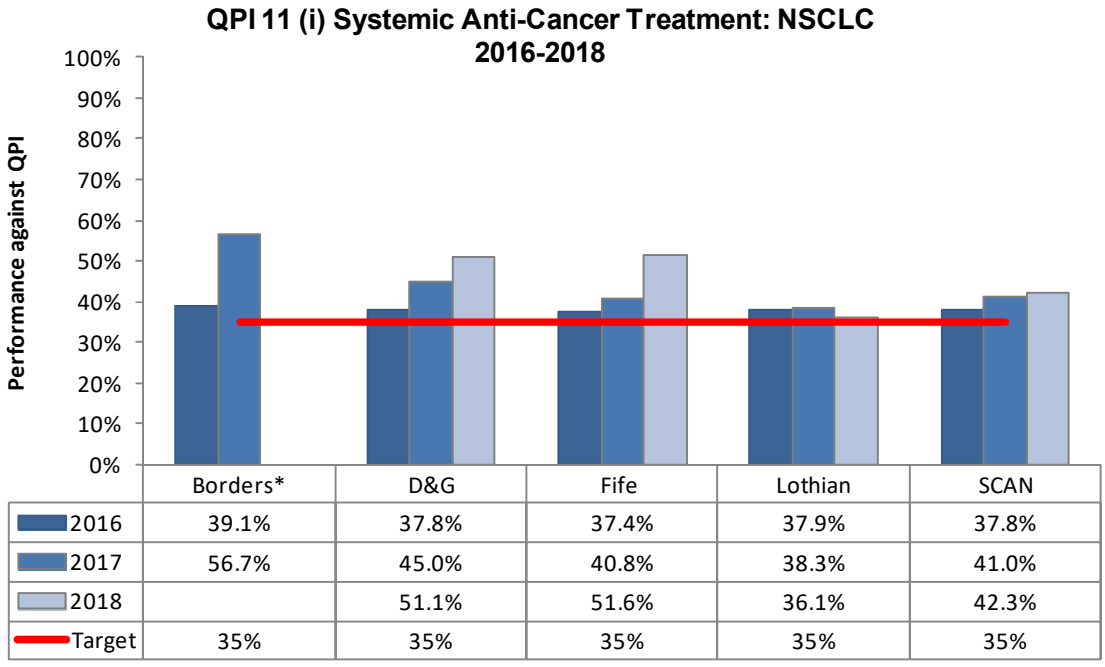
Denominator = All patients with NSCLC not undergoing surgery

Exclusions = Patients who decline chemotherapy and patients who die before treatment

Target 35%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI		100	218	450	767
Numerator		24	64	92	180
Not recorded for numerator		0	0	0	0
Denominator		47	124	255	426
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	0	0
% Performance	**-**	**51.1%**	**51.6%**	**36.1%**	**42.3%**

Comments

The target was met by the 3 health boards reported. Finalised NHS Borders data is awaited.



	Borders*	D&G	Fife	Lothian	SCAN
2016	39.1%	37.8%	37.4%	37.9%	37.8%
2017	56.7%	45.0%	40.8%	38.3%	41.0%
2018		51.1%	51.6%	36.1%	42.3%
Target	35%	35%	35%	35%	35%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

At Formal Review the exclusion criteria was amended and the clause *patients participating in clinical trials* was removed. This took effect for patients diagnosed from 1st January 2016. The results are therefore presented from 2016 and show the most recent 3-year reporting period.

11 (ii) NSCLC, Stage IIIB, IIIC and IV who have Biological Therapy Target = 60%

Numerator = Number of patients with NSCLC, Stage IIIB-IV, PS 0-2 not undergoing surgery, that are EGFR[18] or ALK[19] positive who receive biological therapy.

Denominator = All patients with NSCLC, Stage IIIB-IV, PS 0-2 not undergoing surgery that are EGFR or ALK positive

Exclusions = Patients who decline SACT, patients who die before treatment, and patients who are participating in clinical trials

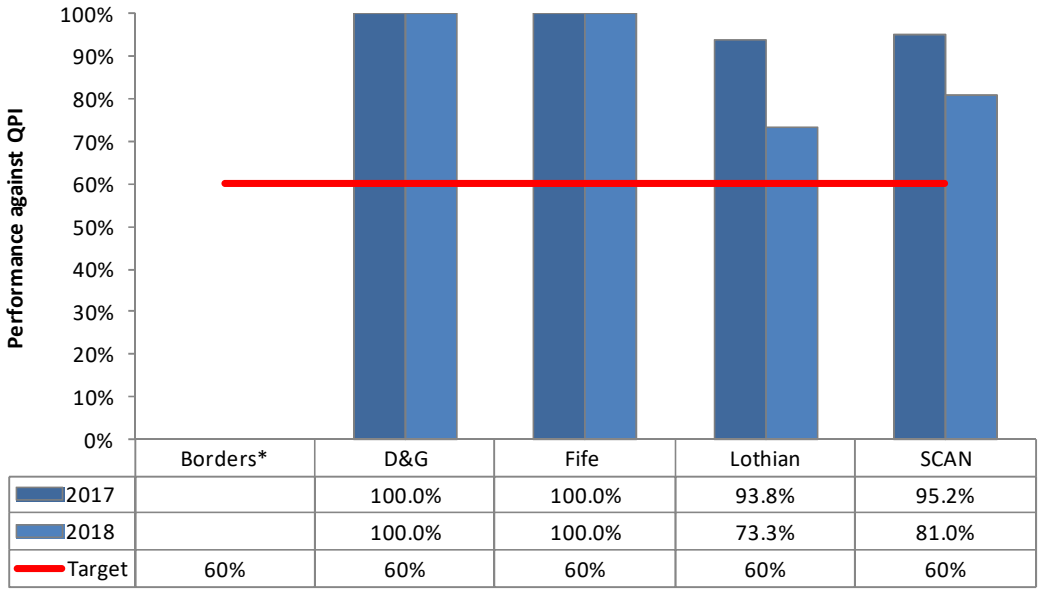
Target 60%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1307
Ineligible for this QPI		143	339	690	1286
Numerator		3	3	11	17
Not recorded for numerator		0	0	0	0
Denominator		3	3	15	21
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	0	0
% Performance	*	**100.0%**	**100.0%**	**73.3%**	**81.0%**

Comments

The target was met by the 3 health boards reported. Finalised NHS Borders data is awaited.

Caution is advised when viewing small numbers which produce disproportionate percentages and distort results positively or negatively.

QPI 11 (ii) Biological Therapy: NSCLC Stages IIIB-IV 2017-2018



	Borders*	D&G	Fife	Lothian	SCAN
2017		100.0%	100.0%	93.8%	95.2%
2018		100.0%	100.0%	73.3%	81.0%
Target	60%	60%	60%	60%	60%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

This QPI was implemented for patients diagnosed with lung cancer from 1st January 2017, and therefore only 2 years of reporting are available.

No patients in NHS Borders met the denominator criteria in 2017 and the zero in the chart represents 'inapplicable' whereas data is not available at this time for 2018.

[18] EGFR: Epidermal Growth Factor Receptor
[19] ALK: Oncogenic Anaplastic Lymphoma Kinase status

QPI 12 Chemotherapy for Small Cell Lung Cancer

At Baseline Review it was agreed to amend QPI 12 and from 1st April 2014 it was divided into 2 parts: (i) Chemotherapy ± radiotherapy and (ii) palliative chemotherapy only.

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

Numerator = Number of patients with SCLC who receive chemotherapy[20] ± radiotherapy

Denominator = All patients with SCLC

Exclusions = Patients who decline chemotherapy, patients who die before treatment and patients who are participating in clinical trials

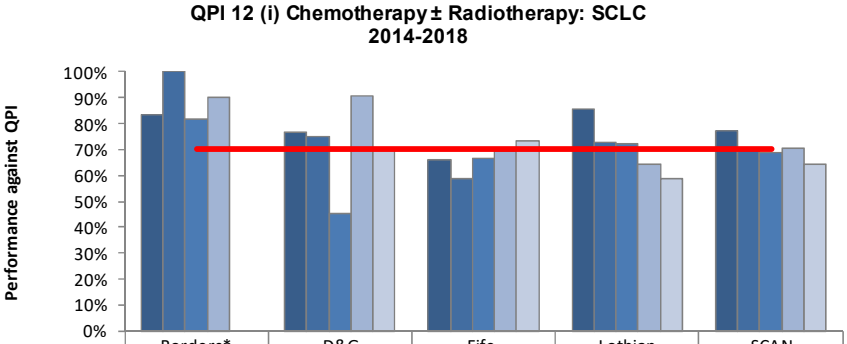
Target 70%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI		135	308	639	1083
Numerator		7	25	38	70
Not recorded for numerator		0	0	0	0
Denominator		10	34	65	109
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	0	0
% Performance	**-**	**70.0%**	**73.5%**	**58.5%**	**64.2%**

Comments

The target was met by NHS D&G and Fife. Finalised NHS Borders data is awaited.

NHS Lothian: The target was not met with a shortfall of 11.5% (27 cases). The chemotherapy component of chemoradiotherapy was contraindicated due to comorbidities for 11 of the 27 patients: 2 of whom were given radical radiotherapy; 5 were treated with palliative radiotherapy; and 4 were not for active treatment, therefore received BSC. A further 13 patients were unable to receive chemoradiotherapy due to poor performance status and/or frailty from cancer. The remaining 3 patients deteriorated rapidly post MDM/pre-treatment and were no longer candidates for radical treatment.

SCLC is a rapidly growing cancer and opportunities for treatment can be missed. In Lothian 13 of the 27 were seen by oncology including 2 via rapid transfer or seen on respiratory wards. However, of the total patients, 13 patients were too frail by the time of pathological diagnosis and 2 others too frail pre MDM to receive palliative chemotherapy. One patient deteriorated post MDM but prior to oncology review. Review work is required on timelines of these 16 patients to see if opportunities to expedite their pathways to enable therapy were missed.



	Borders*	D&G	Fife	Lothian	SCAN
2014-15	83.3%	76.5%	65.9%	85.5%	77.3%
2015	100.0%	75.0%	58.6%	72.7%	70.5%
2016	81.8%	45.5%	66.7%	72.3%	68.7%
2017	90.0%	90.9%	69.2%	64.4%	70.8%
2018		70.0%	73.5%	58.5%	64.2%
"Target"	70%	70%	70%	70%	70%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

[20] Chemotherapy includes Neoadjuvant, Adjuvant, Chemoradiotherapy or Palliative Chemotherapy.

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

Numerator = Number of patients with SCLC not undergoing treatment with curative intent who receive palliative chemotherapy

Denominator = All patients with SCLC not undergoing treatment with curative intent

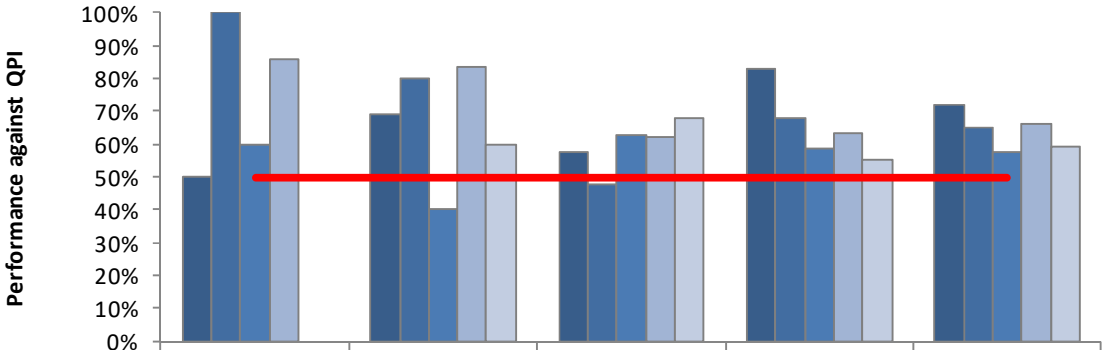
Exclusions = Patients who decline chemotherapy, patients who die before treatment and patients who are participating in clinical trials

Target 50%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI		136	314	647	1097
Numerator		6	19	32	57
Not recorded for numerator		0	0	0	0
Denominator		10	28	58	96
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	0	0
% Performance	**-**	**60.0%**	**67.9%**	**55.2%**	**59.4%**

Comments

The target was met by the 3 health boards reported. Finalised NHS Borders data is awaited.

QPI 12 (ii) Palliative Chemotherapy: SCLC 2014-2018



	Borders*	D&G	Fife	Lothian	SCAN
2014-15	50.0%	69.2%	57.7%	82.9%	72.0%
2015	100.0%	80.0%	47.6%	67.9%	65.1%
2016	60.0%	40.0%	62.5%	58.5%	57.5%
2017	85.7%	83.3%	61.9%	63.5%	66.3%
2018		60.0%	67.9%	55.2%	59.4%
Target	50%	50%	50%	50%	50%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

This QPI was introduced at Baseline Review and the chart covers the 5-year period commencing at Year 2 (2014-15).

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.

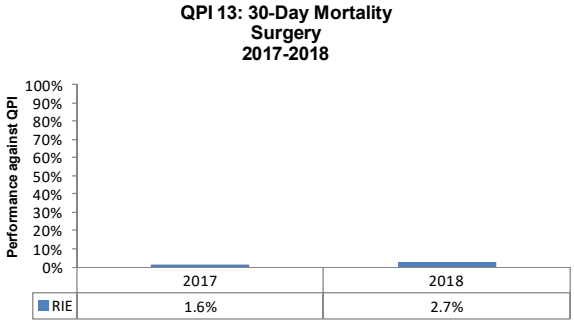
13 (i) A: Surgery: 30-Day Mortality — Target <5%

Numerator = Number of patients who receive surgery who die within 30 days of treatment

Denominator = All patients with lung cancer who receive surgery (no exclusions)

Royal Infirmary of Edinburgh

30 Day Target <5%	2018	2017
Numerator	5	3
Not recorded for numerator	0	0
Denominator*	188	192
Not recorded for exclusions	0	0
Not recorded for denominator	0	0
% Performance	**2.7%**	**1.6%**



* The denominator includes 52 (2018) and 44 (2017) patients who were diagnosed in NHS Tayside and had surgery at RIE. 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. Finalised NHS Borders data is awaited.

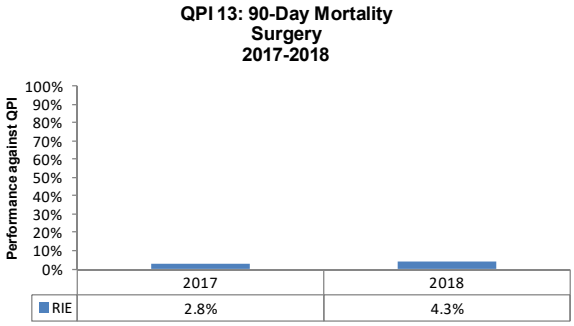
13 (i) B: Surgery: 90-Day Mortality — Target <5%

Numerator = Number of patients who receive surgery who die within 90 days of treatment

Denominator = All patients with lung cancer who receive surgery (no exclusions)

Royal Infirmary of Edinburgh

90 Day Target <5%	2018	2017
Numerator	8	38
Not recorded for numerator	0	0
Denominator*	187	181
Not recorded for exclusions	0	0
Not recorded for denominator	0	0
% Performance	**4.3%**	**2.8%**



* The denominator includes 52 (2018) and 44 (2017) patients who were diagnosed in NHS Tayside and had surgery at RIE. 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. Finalised NHS Borders data is awaited.

Comments

While the majority of QPIs are analysed by Board of Diagnosis, 30- and 90-day mortality post surgery are analysed by *Hospital of Surgery*. Surgical outcomes are the responsibility of the hospital where the surgery was undertaken and not with the health board who referred patients (often outwith their HB area) for surgical resection.

Patients diagnosed in NHS Borders have been removed from the analysis in 2018 pending in-house data checks before publication of their results.

There were 8 deaths within 90 days of surgery (which includes the 5 who died at 30-day post surgery). Results remain within the accepted target parameters and, in line with good clinical practice, the reasons are detailed below:
5 patients died immediately following surgery in hospital from complications and infections
3 patients died post discharge of unknown causes at home with no information received from primary care

(See Appendix 2 *Glossary* for definitions of acronyms and abbreviations).

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

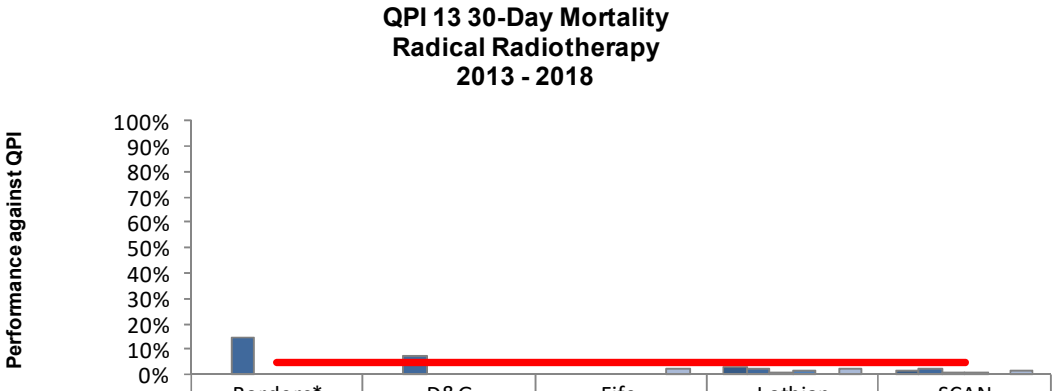
Numerator = Number of patients who receive radical radiotherapy who die within 30 days of treatment

Denominator = All patients with lung cancer who receive radical radiotherapy (no exclusions)

Target <5%	**Borders**	**D&G**	**Fife**	**Lothian**	**SCAN**
2018 cohort		146	342	705	1193
Ineligible for this QPI		135	298	604	1037
Numerator		0	1	2	3
Not recorded for numerator		0	0	0	0
Denominator		11	44	101	156
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	0	0
% Performance	**-**	**0.0%**	**2.3%**	**2.0%**	**1.9%**

Comments

There were no deaths within 30 days of patients receiving radical radiotherapy in NHS D&G in 2018 or in NHS Borders (confirmation awaited). See QPI 13 (ii) B 90 Day Mortality for radical radiotherapy commentary concerning all deceased patients.



	Borders*	D&G	Fife	Lothian	SCAN
2013-14	0.0%	0.0%	0.0%	2.9%	1.7%
2014-15	14.3%	7.1%	0.0%	2.0%	2.5%
2015	0.0%	0.0%	0.0%	1.0%	0.6%
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%	2.3%	2.0%	1.9%
Target <5%	5%	5%	5%	5%	5%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

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

Numerator = Number of patients who receive radical radiotherapy who die within 90 days of treatment

Denominator = All patients with lung cancer who receive radical radiotherapy (no exclusions)

Target <5%	**Borders**	**D&G**	**Fife**	**Lothian**	**SCAN**
2018 cohort		146	342	705	1193
Ineligible for this QPI		135	298	604	1037
Numerator		1	2	6	9
Not recorded for numerator		0	0	0	0
Denominator		11	44	101	156
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	0	0
% Performance	**-**	**9.1%**	**4.5%**	**5.9%**	**5.8%**

Comments

There were no deaths of patients diagnosed with lung cancer within 90 days of receiving radical radiotherapy in NHS Borders (confirmation awaited). NHS Fife results remain within the accepted target parameters although this has been exceeded by NHS Fife and Lothian. For completeness, reasons for all health boards are detailed below.

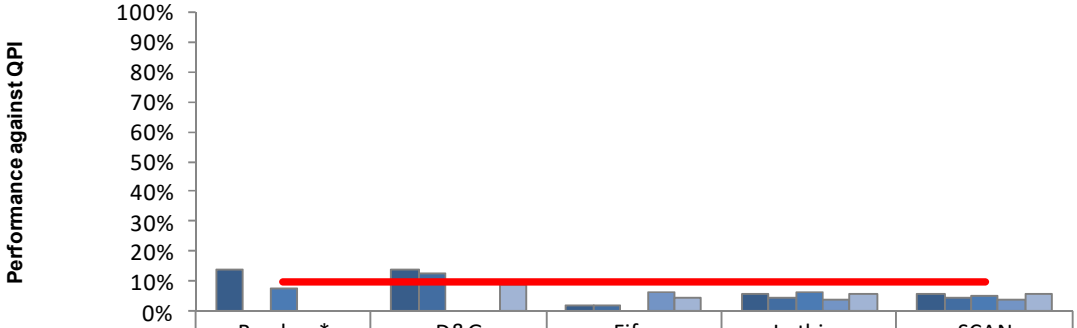
NHS D&G: The target was exceeded by 4.1% (1 case). The patient died of comorbidity but also with progressive disease.

NHS Fife: 2 patients died within 90 days of receiving radical radiotherapy though results remain within the accepted parameters. On review neither were due to radiotherapy and both more likely comorbidity and progression.

NHS Lothian: The target was exceeded by 0.9% (6 cases). M & M meetings are held to discuss all deceased patients. Information is only available for 3 of the 6 patients at this time and, the remainder will be reported on in due course. 2 died of progressive disease and the third died suddenly at home of unknown cause.

(See Appendix 2 *Glossary* for definitions of acronyms and abbreviations).

QPI 13 90-Day Mortality
Radical Radiotherapy
2014-2018



	Borders*	D&G	Fife	Lothian	SCAN
2014-15	14.3%	14.3%	2.4%	6.0%	6.1%
2015	0.0%	12.5%	2.4%	4.8%	4.4%
2016	7.7%	0.0%	0.0%	6.6%	5.1%
2017	0.0%	0.0%	6.7%	4.0%	4.1%
2018		9.1%	4.5%	5.9%	5.8%
Target <5%	10%	10%	10%	10%	10%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

90-day mortality analyses were introduced following Baseline Review and reporting commenced in the 2014-15 reporting period. The chart for 90-day mortality therefore covers 5 years' reporting compared to 30-day mortality which encompasses 6 years of data.

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
2018 cohort		146	342	705	1193
Ineligible for this QPI		143	340	691	1174
Numerator		0	0	0	0
Not recorded for numerator		0	0	0	0
Denominator		3	2	14	19
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	0	0
% Performance	**-**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Comments

There were no deaths within 30 days for patients diagnosed with lung cancer in 2018 who received adjuvant chemotherapy in SCAN. Confirmation is awaited from NHS Borders. This has been the pattern over the past 6 years of QPI reporting and a chart has, therefore, not been included.

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

Numerator = Number of patients who receive chemoradiotherapy who die within 30 days of treatment

Denominator = All patients with lung cancer who receive chemoradiotherapy (no exclusions)

Target <5%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI		142	321	676	1139
Numerator		0	1	0	1
Not recorded for numerator		0	0	0	0
Denominator*		4	21	29	54
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	0	0
% Performance	**-**	**0.0%**	**4.8%**	**0.0%**	**1.9%**

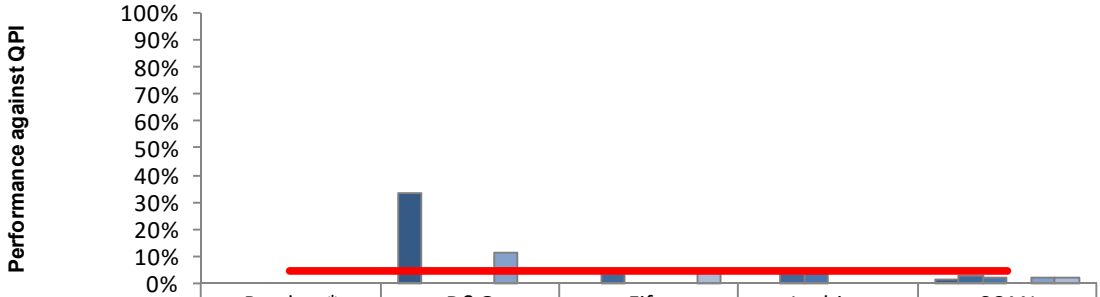
*** NHS Fife**: At the time of analysis, 30 days since treatment had not yet elapsed for 1 patient; who is not included in the table above.

Comments

There were no deaths within 30 days following chemoradiotherapy in NHS D&G or Lothian. Confirmation is awaited from NHS Borders.

NHS Fife: Results remain within accepted target parameters. See QPI 13 (iv) B 90-Day Mortality for chemoradiotherapy commentary concerning all deceased patients.

QPI 13 30-Day Mortality
Chemoradiotherapy
2013-2018



	Borders*	D&G	Fife	Lothian	SCAN
2013-14	0.0%	33.3%	0.0%	0.0%	1.2%
2014-15	0.0%	0.0%	3.3%	3.3%	2.7%
2015	0.0%	0.0%	0.0%	4.3%	2.5%
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%	4.8%	0.0%	1.9%
Target <5%	5%	5%	5%	5%	5%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

The disproportionately large percentage (33.3%) in D&G in 2013-14 was the result of 1 death out of 3 patients which reminds us that we have to be cognisant of the effects small numbers can have relative to percentage, positively or negatively.

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

Numerator = Number of patients who receive chemoradiotherapy who die within 90 days of treatment

Denominator = All patients with lung cancer who receive chemoradiotherapy (no exclusions)

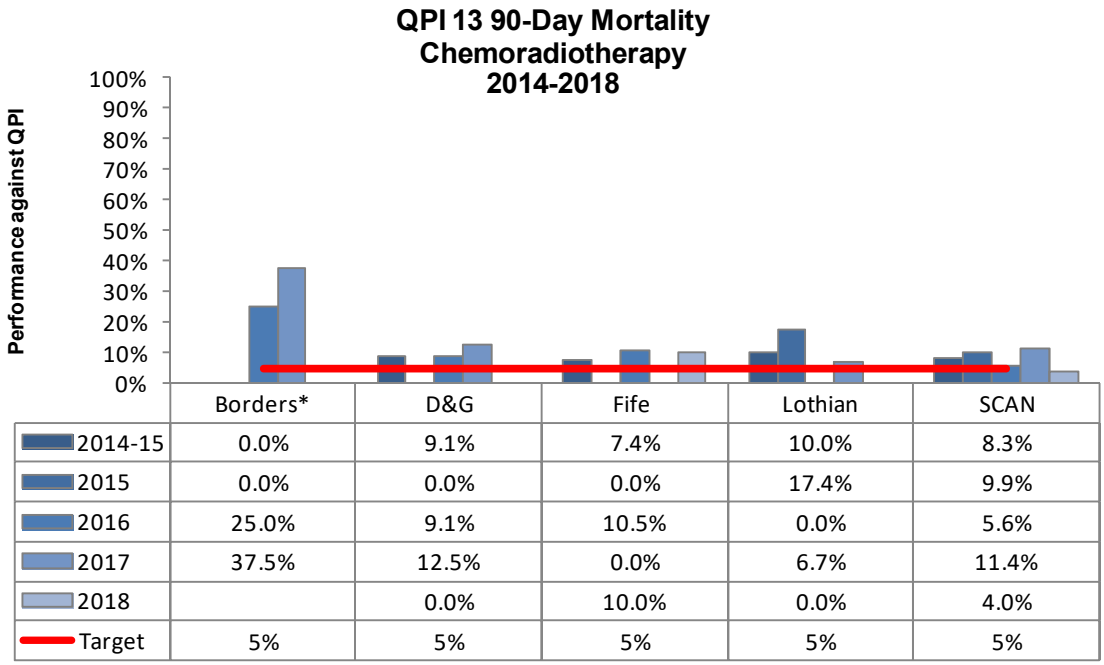
Target <5%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI		145	322	676	1143
Numerator		0	2	0	2
Not recorded for numerator		0	0	0	0
Denominator*		1	20	29	50
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	0	0
% Performance	**-**	**0.0%**	**10.0%**	**0.0%**	**4.0%**

*90 days since treatment had not elapsed for 3 patients from D&G or for 2 patients from NHS Fife at the time of analysis and they are not included here.

Comments

There were no deaths of patients diagnosed with lung cancer within 90 days of receiving chemoradiotherapy in NHS D&G and Lothian. The target was exceeded by NHS Fife. Confirmation is awaited from NHS Borders. An outcome, drawn from very small numbers can produce disproportionately high percentages.

NHS Fife: The target was exceeded by 5% (2 cases). On review both patients died of progressive cancer.



	Borders*	D&G	Fife	Lothian	SCAN
2014-15	0.0%	9.1%	7.4%	10.0%	8.3%
2015	0.0%	0.0%	0.0%	17.4%	9.9%
2016	25.0%	9.1%	10.5%	0.0%	5.6%
2017	37.5%	12.5%	0.0%	6.7%	11.4%
2018		0.0%	10.0%	0.0%	4.0%
Target	5%	5%	5%	5%	5%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

90-day mortality analyses were introduced following Baseline Review and reporting commenced in the 2014-15 reporting period. The chart for 90-day mortality therefore covers 5 years' reporting compared to 30-day mortality which encompasses 6 years of data.

QPI 13 (v): 30-Day Mortality: Palliative Chemotherapy – NSCLC Target < 10%

Numerator = Number of patients diagnosed with NSCLC who receive palliative chemotherapy who die within 30 days of treatment

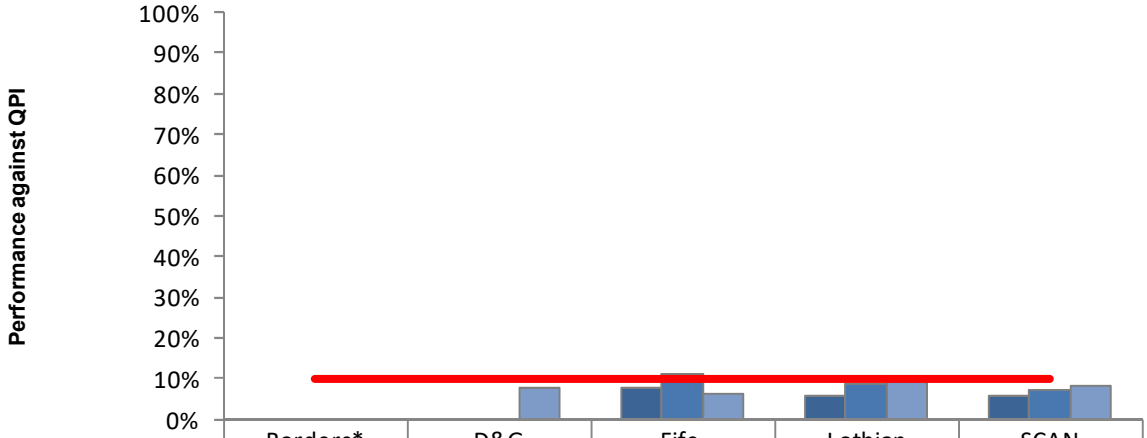
Denominator = All patients with NSCLC who receive palliative chemotherapy (no exclusions)

Target <10%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI		133	310	666	1109
Numerator		1	2	4	7
Not recorded for numerator		0	0	0	0
Denominator		13	32	39	84
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	0	0
% Performance	**-**	**7.7%**	**6.3%**	**10.3%**	**8.3%**

Comments

Results remained within the accepted target parameters in NHS D&G and Fife; although were exceeded by NHS Lothian. Data is awaited from NHS Borders. All 30 day mortality post systemic therapy is subject to peer review and meetings in oncology every 6 months. A report on mortality following palliative chemotherapy for patients diagnosed with NSCLC is underway and will be available in due course.

QPI 13 30-Day Mortality
Palliative Chemotherapy: NSCLC
2016-2018



	Borders*	D&G	Fife	Lothian	SCAN
2016			7.7%	5.7%	5.7%
2017	0.0%	0.0%	11.1%	8.6%	7.1%
2018		7.7%	6.3%	10.3%	8.3%
Target <10%	10%	10%	10%	10%	10%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

The reporting of 30-day mortality following palliative chemotherapy was revised at Formal Review and patients diagnosed with NSCLC and SCLC should be reported separately. This took effect for patients diagnosed from 1st January 2016. The chart shows the last 3 years of reporting and is specified as NSCLC, whereas results for SCLC are found in the following table and chart.

QPI 13 (vi): 30-Day Mortality: Palliative Chemotherapy – SCLC Target < 15%

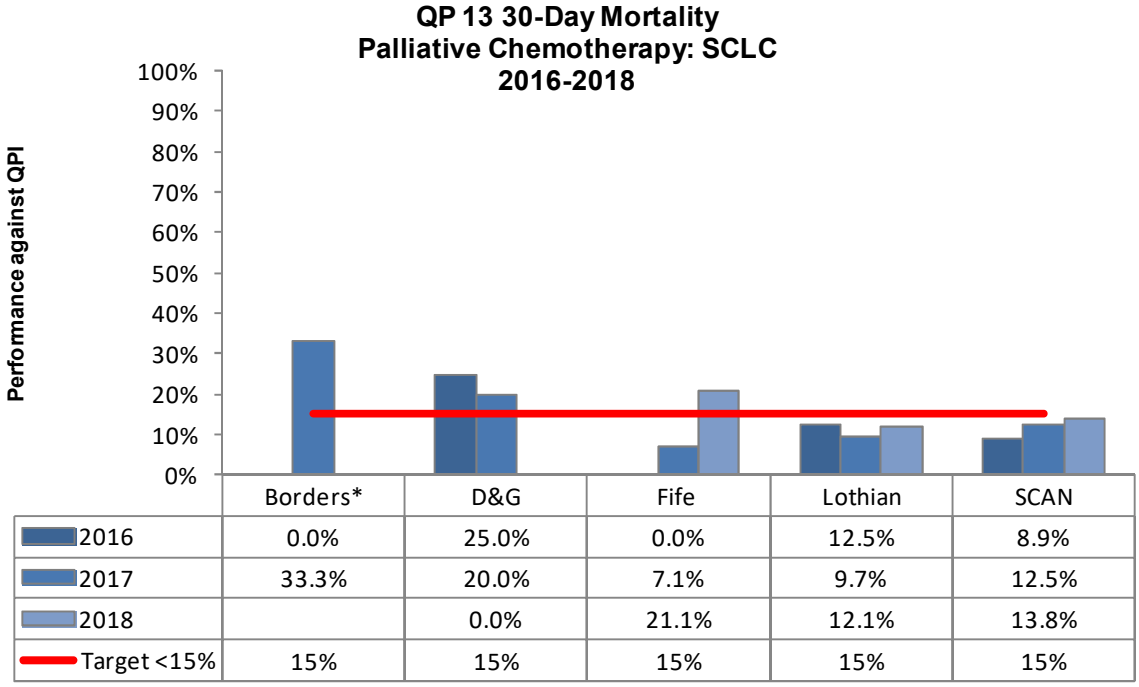
Numerator = Number of patients diagnosed with SCLC who receive palliative chemotherapy who die within 30 days of treatment

Denominator = All patients with SCLC who receive palliative chemotherapy (no exclusions)

Target <15%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI		140	323	672	1135
Numerator		0	4	4	8
Not recorded for numerator		0	0	0	0
Denominator		6	19	33	58
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	0	0
% Performance	**-**	**0.0%**	**21.1%**	**12.1%**	**13.8%**

Comment

Results remain within the accepted target parameters in NHS D&G (no deaths) and Lothian (4 cases); although were exceeded by NHS Fife. Data from NHS Borders is awaited. All 30 day mortality post systemic therapy is subject to peer review and meetings in oncology every 6 months. A report on mortality following palliative chemotherapy for patients diagnosed with SCLC is underway and will be available in due course.



	Borders*	D&G	Fife	Lothian	SCAN
2016	0.0%	25.0%	0.0%	12.5%	8.9%
2017	33.3%	20.0%	7.1%	9.7%	12.5%
2018		0.0%	21.1%	12.1%	13.8%
Target <15%	15%	15%	15%	15%	15%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

The reporting of 30-day mortality following palliative chemotherapy was revised at Formal Review and takes effect for patients diagnosed from 1st January 2016. The chart therefore includes the last 3 years of data only.

QPI 13 (vii): Biological Therapy: 30-Day Mortality – NSCLC Target <10%

Numerator = Number of patients diagnosed with NSCLC who receive biological therapy who die within 30 days of treatment

Denominator = All patients with NSCLC who receive biological therapy (no exclusions)

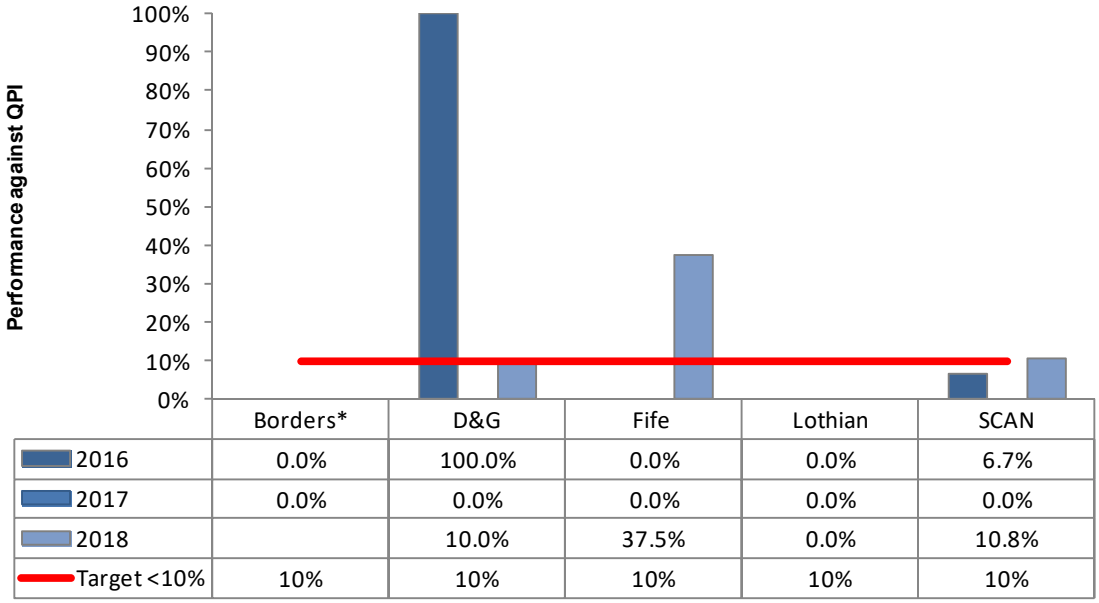
Target <10%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI		136	326	666	1128
Numerator		1	6	0	7
Not recorded for numerator		0	0	0	0
Denominator		10	16	39	65
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	0	0
% Performance		**10.0%**	**37.5%**	**0.0%**	**10.8%**

Comments

This QPI now includes immunotherapy as well as TKI tablet therapy.

There were no deaths within 30 days of patients receiving biological therapy in 2018 for NHS Lothian. Confirmation is awaited from NHS Borders. The target was exceeded in the other 2 Boards. All 30 day mortality post systemic therapy is subject to peer review and meetings in oncology every 6 months. A report on mortality following palliative chemotherapy for patients diagnosed with SCLC is underway and will be available in due course.

QPI 13 30-Day Mortality
Biological Therapy: NSCLC
2016-2018



	Borders*	D&G	Fife	Lothian	SCAN
2016	0.0%	100.0%	0.0%	0.0%	6.7%
2017	0.0%	0.0%	0.0%	0.0%	0.0%
2018		10.0%	37.5%	0.0%	10.8%
Target <10%	10%	10%	10%	10%	10%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

The reporting of 30-day mortality following biological therapy was revised at Formal Review and takes effect for patients diagnosed from 1st January 2016. The chart therefore includes 3 years of data only.

Small numbers can generate disproportionate percentages as evidenced in the result in NHS Fife where a total of 6 deaths yield a performance rate of 37.5% in 2018; and a rate of 100% in D&G in 2016 where this accounts for 1 patient from a denominator of 1. Small numbers and variation may be due to chance and aggregation of results over time can help to clarify outcomes.

Biological Therapy is not a treatment option for patients diagnosed with SCLC and therefore analyses are only possible for patients diagnosed with NSCLC.

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

(SABR: Stereotactic Ablative Radiotherapy)

Numerator = Number of patients with Stage I[21] lung cancer not undergoing surgery who receive SABR

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
2018 cohort		146	342	705	1193
Ineligible for this QPI		132	303	617	1052
Numerator		0	15	27	42
Not recorded for numerator		0	0	0	0
Denominator		4	39	87	130
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		10	0	1	11
% Performance	**-**	**0.0%**	**38.5%**	**31.0%**	**32.3%**

Comments

As the population ages so the incidence of lung cancer is increasing and often these patients have multiple medical co-morbidities precluding surgical resection or they may decide to decline surgery. Radiotherapy, including SABR, is an alternative treatment mode available to such patients.

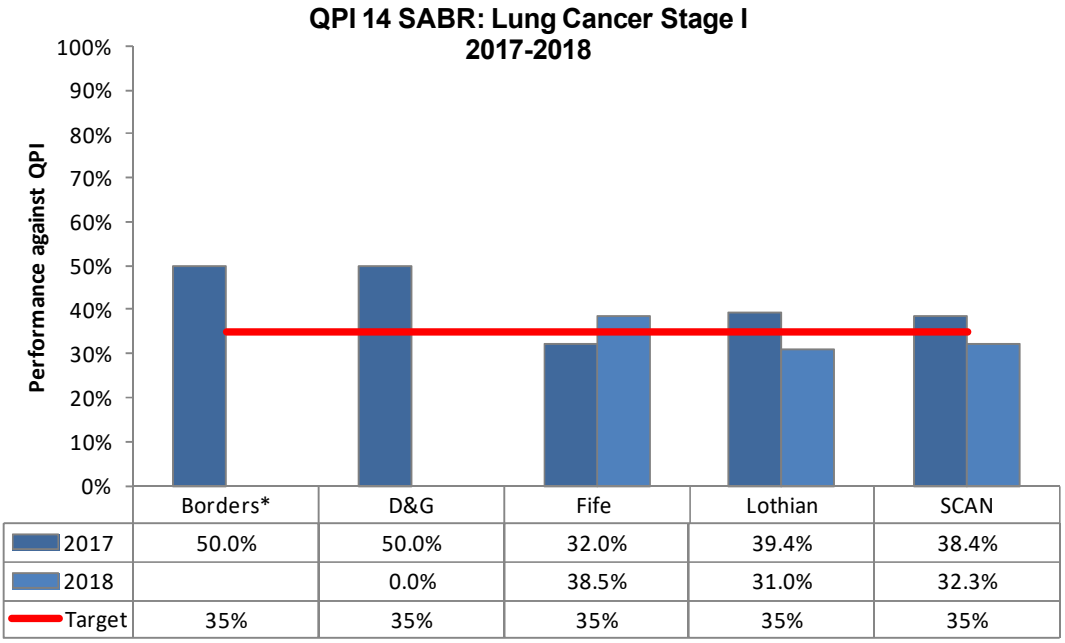
This QPI was new to our reporting programme at Formal Review and took effect from 1st January 2017, coinciding with the implementation of a new data field [SABR]; a specialised type of radiotherapy which precisely targets the tumour with radiation whilst lowering the risk of damage to surrounding tissue.

In year 2 the target was met by NHS Fife while, in NHS D&G zero patients underwent SABR and results for D&G should be interpreted as “not applicable”. Finalised NHS Borders data is awaited.

NHS Lothian: the target was not met with a shortfall of 4.0% (60 cases). Lesions were too close to critical structures for 20 patients who instead received conventional radical radiotherapy, except for 1 patient who was treated with high dose palliative radiotherapy. The risk of chest wall toxicity with SABR was discussed with 1 patient who went on to have conventional radical radiotherapy. Overlap with previous radiotherapy given for a head & neck cancer precluded SABR for 1 patient who received conventional radical radiotherapy as treatment for their lung cancer.1 patient received conventional radical radiotherapy because SABR was not possible due to large volume of disease. 2 patients were given high dose palliative radiotherapy when SABR was precluded due to poor fitness levels due to co-morbidities. Poor fitness levels due to co-morbidities also meant that 32 patients were for supportive care only and not SABR.1 patient initially opted for a watch and wait approach. At a later review the patient could only be offered BSC. Reasons for not receiving SABR were not documented for the remaining 2 patients.

For those patients who are not operable or who decline surgery, radiotherapy is an alternative treatment approach. An important question is whether SABR has comparable outcomes to surgery and/or conventional radical radiotherapy for early stage NSCLC. Peer review to ensure consistency of SABR versus conventional radiotherapy is currently underway in SCAN (see Action Plan 2018).

[21] Stage I: T1 or T1(mi) or T1a-1c, N0, M0



	Borders*	D&G	Fife	Lothian	SCAN
2017	50.0%	50.0%	32.0%	39.4%	38.4%
2018		0.0%	38.5%	31.0%	32.3%
Target	35%	35%	35%	35%	35%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

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 treatment

Denominator = All patients with lung cancer who receive surgery

Exclusions = Patients who decline investigations

Target 75%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI		129	306	605	1040
Numerator		10	19	75	104
Not recorded for numerator		0	0	0	0
Denominator		17	36	100	153
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	0	0
% Performance	**-**	**58.8%**	**52.8%**	**75.0%**	**68.0%**

Comments

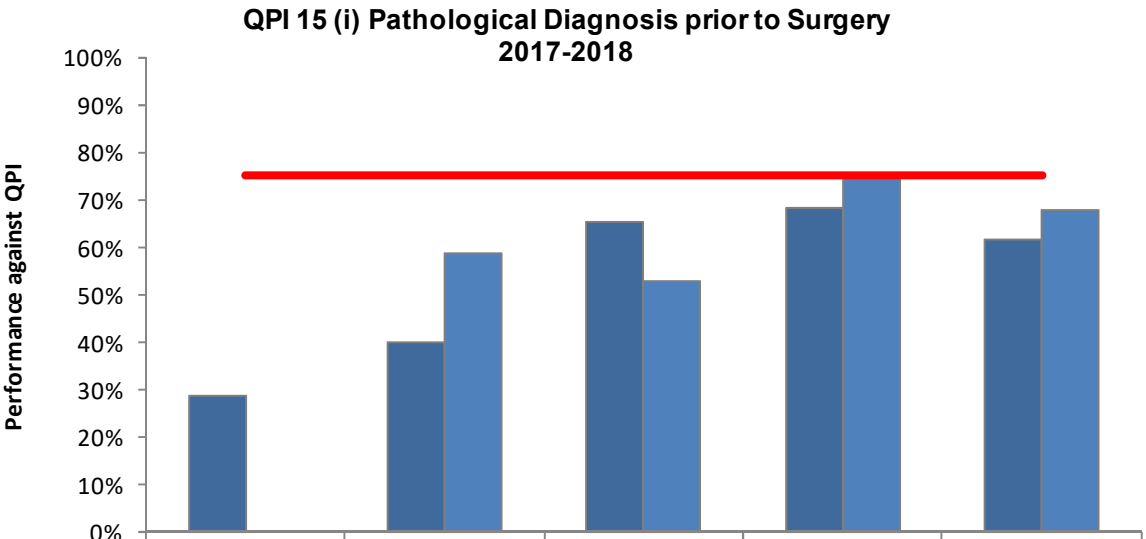
This QPI was introduced at Formal Review and was implemented from 1st January 2017. The target has not been attained for the 2 years reported thus far, except for NHS Lothian in 2018, where it has been achieved by the slimmest of margins. Finalised data is awaited from NHS Borders.

NHS D&G: The target was not met with a shortfall of 16.2% (7 cases). 1 patient's biopsy came back negative and for another results were negative on multiple biopsies; in 3 cases tumours were not accessible; and biopsy was attempted but abandoned for 2 patients: (i) unable to access lesion and (ii) abandoned due to a significant risk of pneumothorax.

NHS Fife: The target was not met with a shortfall of 22.2% (17 cases). 6 patients' biopsies returned negative results, 1 of whom went on to have frozen section, which demonstrated adenocarcinoma, and underwent surgical resection on the same day. A further 2 patients' similarly demonstrated adenocarcinoma on frozen section and continued to resection on the same day. 7 patients could not undergo biopsy as their lesions were too small and/or inaccessible to biopsy. Surveillance of a further 2 patients demonstrated growth in lesions over time and direct referral was made at MDM for surgical resection.

It is generally accepted that these all represent valid clinical reasons for not pursuing histology or cytology. Nevertheless, a mini audit has been proposed to consider the notion of "bravery" versus a more conservative approach to biopsy. Results will be presented in next year's report. (Action Plan 2018)

It was acknowledged that the target might have been set rather high for this modality. Lung Cancer QPI second cycle of Formal Review is currently underway and review of target levels for each of the three modalities (surgery, radical radiotherapy and chemoradiotherapy) is anticipated.



	Borders*	D&G	Fife	Lothian	SCAN
2017	28.6%	40.0%	65.5%	68.2%	61.8%
2018		58.8%	52.8%	75.0%	68.0%
Target	75%	75%	75%	75%	75%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

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. It is recognised that not all lesions will be accessible for pre-treatment diagnoses, i.e. small and/or peripheral lesions. A number of negative and inconclusive histologies which radiologically merit referral to surgery are also likely. All patients are discussed fully at MDM so that all approaches are considered and to ensure that all proper processes take their course.

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 treatment.

Denominator = All patients with lung cancer who receive radical radiotherapy

Exclusions = Patients who decline investigations

Target 75%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI		135	298	605	1038
Numerator		8	18	64	90
Not recorded for numerator		0	0	0	0
Denominator		11	44	100	155
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	0	0
% Performance	**-**	**72.7%**	**40.9%**	**64.0%**	**58.1%**

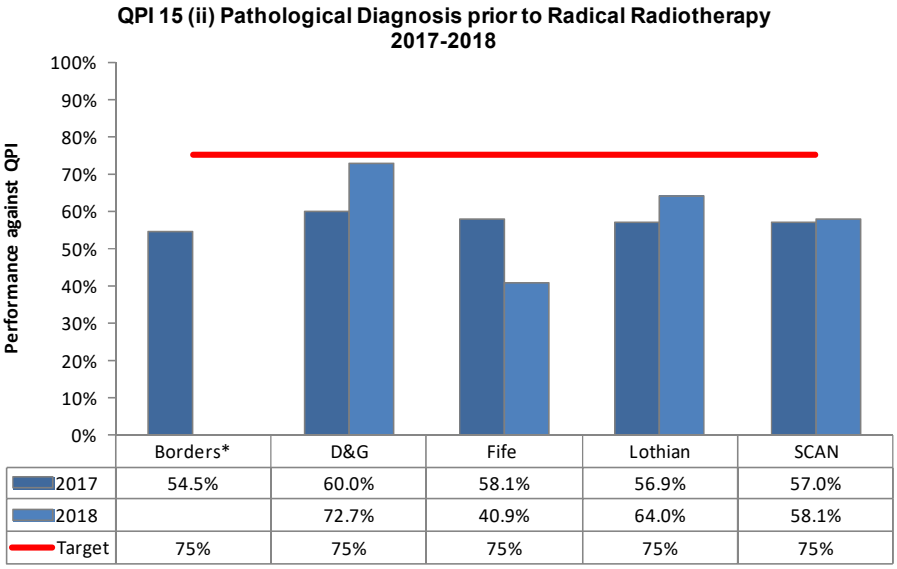
Comments

This QPI was new to our reporting programme from 1st January 2017. The target has not been attained for the 2 years reported thus far across all SCAN health boards. Finalised NHS Borders data is awaited and it is anticipated that the target will not be met. At the SCAN Sign Off meeting it was noted that the results appeared somewhat disappointing and concern was voiced as to why the target was not lower in this instance given that patients included here are not fit for surgery and should therefore be subject to different criteria and scrutiny than QPI 15 (i) and indeed (iii). It was agreed that a request for amendment should be submitted at Review (see Action Plan 2017).

NHS D&G: The target was not met with a shortfall of 2.3% (3 cases). 1 patient's lesion was inaccessible to biopsy and another's returned negative washings at bronchoscopy. The remaining patient had negative cytology on each of 2 attempts at bronchoscopy.

NHS Fife: The target was not met with a shortfall of 34.1% (26 cases). 12 patients were not fit for biopsy due to poor lung function and/or comorbidities. 7 patients had negative biopsy and for a further 2 tissue was inadequate for diagnosis. Lesions were too small for biopsy for 4 patients who were given SABR and biopsy was cancelled for the remaining patient who was also given SABR. It was agreed that the lack of tissue did not impact on the choice of treatment for these patients.

NHS Lothian: The target was not met with a shortfall of 9.7% (34 cases). Tumours were too small to biopsy for 5 patients and a further 3 were inaccessible to biopsy. For 3 patients, the lesions were too small and additionally inaccessible. Biopsy was attempted but abandoned. Biopsy was deemed too risky for 22 patients due to comorbidities and it was agreed they should proceed without tissue diagnosis.



* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

15 (iii) Cytology or Histology prior to Chemoradiotherapy Target = 75%

Numerator = Number of patients with lung cancer receiving chemoradiotherapy who have a cytological/histological diagnosis prior to treatment.

Denominator = All patients with lung cancer who receive chemoradiotherapy

Exclusions = Patients who decline investigations

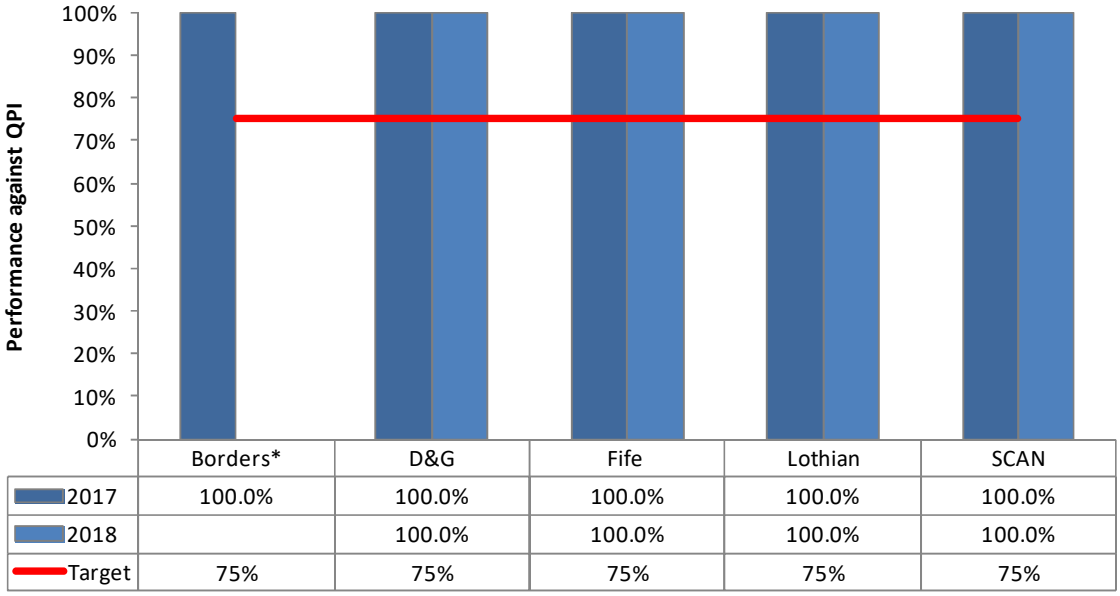
Target 75%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI		142	320	676	1138
Numerator		4	22	29	55
Not recorded for numerator		0	0	0	0
Denominator		4	22	29	55
Not recorded for exclusions		0	0	0	0
Not recorded for denominator		0	0	0	0
% Performance	**-**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Comments

This QPI was new to our reporting programme and was implemented from 1st January 2017.

The target was easily surpassed by all SCAN Health Boards; final confirmation is awaited from NHS Borders. It was acknowledged at Sign Off that these results are as expected given that it is good medical practice to not give chemotherapy without pathology in place; pathology which additionally indicates the appropriate chemotherapy agent(s) to be administered.

QPI 15 (iii) Pathological Diangosis prior to Chemoradiotherapy 2017-2018



	Borders*	D&G	Fife	Lothian	SCAN
2017	100.0%	100.0%	100.0%	100.0%	100.0%
2018		100.0%	100.0%	100.0%	100.0%
Target	75%	75%	75%	75%	75%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

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 treatment

Denominator = All patients with lung cancer N2 disease who receive curative treatment[22]

Exclusions = Patients who decline brain imaging

Target 95%	Borders	D&G	Fife	Lothian	SCAN
2018 cohort		146	342	705	1193
Ineligible for this QPI		142	323	665	1130
Numerator		4	7	32	43
Not recorded for numerator		0	0	0	0
Denominator		4	19	39	62
Not recorded for exclusions		0	0	1	1
Not recorded for denominator		0	0	1	1
% Performance	**-**	**100.0%**	**36.8%**	**82.1%**	**69.4%**

Comments

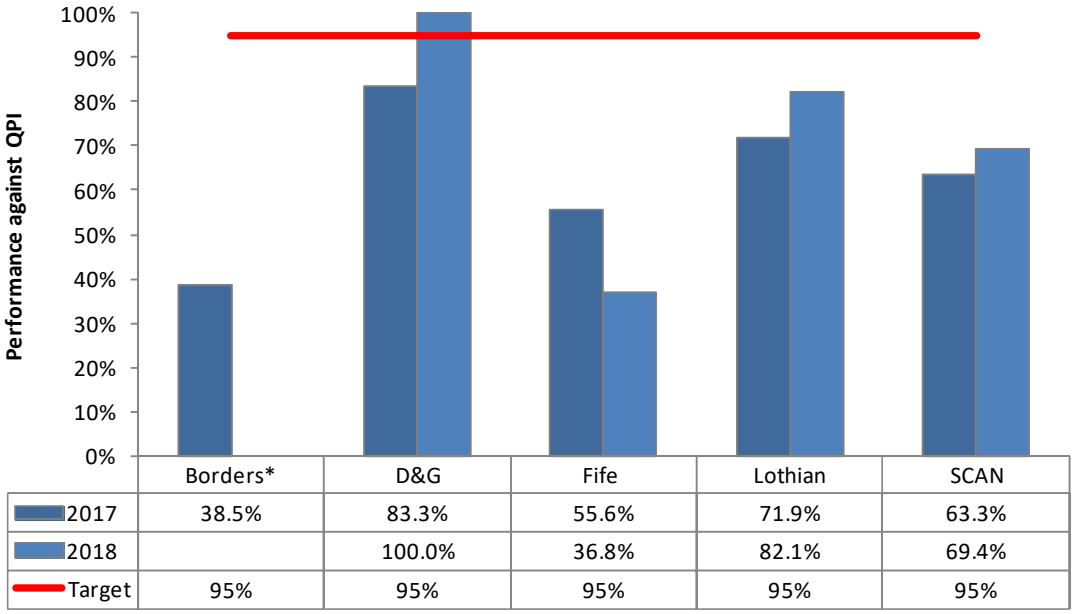
This QPI was implemented from 1st January 2017. The target was not met by SCAN Health Boards in 2017. In 2018 only NHS D&G exceeded the target attaining 100%. This should be viewed with a degree of caution and likely is simply generated by small numbers.

NHS Fife: The target was not met with a shortfall of 58.2% (12 cases). No reasons have been documented. However, of these patients, 1 had contrast CT head scan mid treatment pathway and another occurred post treatment.

NHS Lothian: The target was not met with a shortfall of 12.9% (7 cases). 1 patient, originally thought to be metastatic and for palliative treatment, was downgraded at CT PET and subsequently went on to have radical treatment. No reasons were documented for 6 outliers although of these, 1 had non-contrast CT Head and another underwent CT Head after treatment had started.

These results are again somewhat disappointing. Although this QPI was listed as an Action in the 2017 Report, changes had not been implemented until mid to late 2018 (aligned with the reporting schedule). It is anticipated that improvements will become more apparent in 2019 and QPI 16, therefore, is retained as an Action in 2018.

QPI 16 Contrast-Enhanced Brain Imaging for N2 Disease 2017-2018



	Borders*	D&G	Fife	Lothian	SCAN
2017	38.5%	83.3%	55.6%	71.9%	63.3%
2018		100.0%	36.8%	82.1%	69.4%
Target	95%	95%	95%	95%	95%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

[22] 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

Consented Target 15%	Borders	D&G	Fife	Lothian	SCAN
Numerator	0	0	0	9	9
Denominator	97	147	345	769	1358
% Performance	**0%**	**0%**	**0%**	**1.2%**	**0.7%**

Consented Trials in 2018	Numbers Recruited
A Phase 1/1b Study of Paclitaxel in Combination with BOS172722, a Monopolar Spindle 1 Kinase Inhibitor, in Patients with Advanced Nonhaematologic Malignancies	1
CANC-4880 - PEARLS: A randomized, phase 3 trial with anti-PD-1 monoclonal antibody pembrolizumab (MK-3475) versus placebo for patients with early stage NSCLC after resection and completion of standard adjuvant therapy (PEARLS)	2
FAK-PD1 v1	1
Phase 3 Study of Pembrolizumab/Epacadostat/Chemotherapy in NSCLC	1
Predicting treatment response to radiotherapy for bone cancer pain	1
The MENAC Trial	3
TOTAL	9

Comment

Lung clinical trial eligibility criteria are becoming increasingly complex with most trials geared towards targeted therapies. Fewer trials were available to patients in 2018 and, of those available eligibility criteria were challenging which prevented many patients from entering trials. It is anticipated that more trials will be available to lung cancer patients in 2019.

An action plan had been identified in the 2016 (and 2017) report, and this should be retained in 2018:

- SCAN clinicians should ensure that they register trials with SCRN and, that SCRN should share their lists of open trials between the Networks to allow the possibility of cross network trial access.
- Researchers should be encouraged to look at trials based on quality of life or end of life, as many lung cancer patients may benefit from those kinds of studies.
- Although clinical trials for patients diagnosed with lung cancer remain challenging due to stringent entry criteria, ongoing efforts by clinical staff will ensure that all appropriate patients are included in trials.

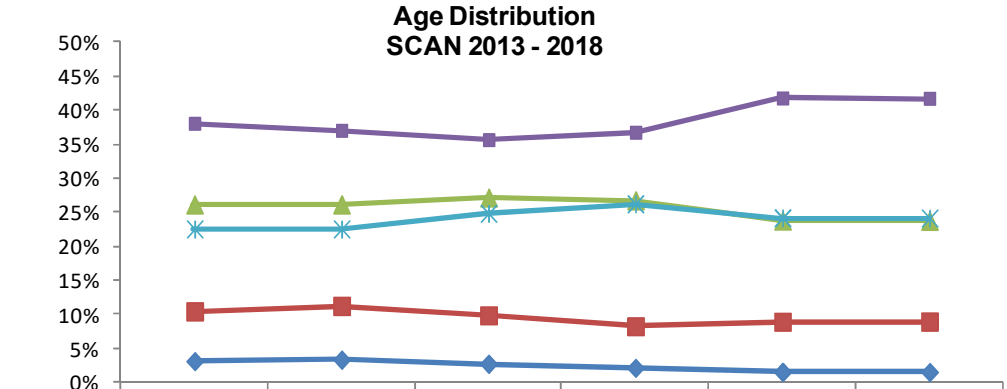
Key Categories

NHS Borders have been removed from key categories analyses in 2018 pending in-house data checks prior to publication of results in due course.

Table 1 Age at Diagnosis

n = All patients diagnosed with Lung Cancer 01/01/2018 – 31/12/2018

2018	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
≤49			2	1.4%	4	1.2%	12	1.7%	18	1.5%
50-59			17	11.6%	26	7.6%	63	8.9%	106	8.9%
60-69			34	23.3%	98	28.7%	151	21.4%	283	23.7%
70-79			60	41.1%	148	43.3%	290	41.1%	498	41.7%
≥80			33	22.6%	66	19.3%	189	26.8%	288	24.1%
Median			**73**		**73**		**74**		**74**	
Range			47-93		39-92		20-94		20-94	



	2013-2014	2014-2015	2015	2016	2017	2018
≤49	3.1%	3.3%	2.7%	2.1%	1.5%	1.5%
50-59	10.4%	11.2%	9.8%	8.2%	8.9%	8.9%
60-69	26.1%	26.1%	27.1%	26.7%	23.7%	23.7%
70-79	38.0%	37.0%	35.6%	36.7%	41.7%	41.7%
≥80	22.5%	22.5%	24.8%	26.2%	24.1%	24.1%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

Table 2 Sex Distribution

n = All patients diagnosed with Lung Cancer 01/01/2018 – 31/12/2018

2018	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
Male			72	49.3%	177	51.8%	333	47.2%	582	48.8%
Female			74	50.7%	165	48.2%	372	52.8%	611	51.2%

Historic Data: Sex Distribution

SCAN	2013-14	2014-15	2015	2016	2017
Male	51.4%	48.8%	50.9%	50.1%	48.6%
Female	48.6%	51.6%	49.1%	49.9%	51.4%

Table 3 Age and Gender Distribution

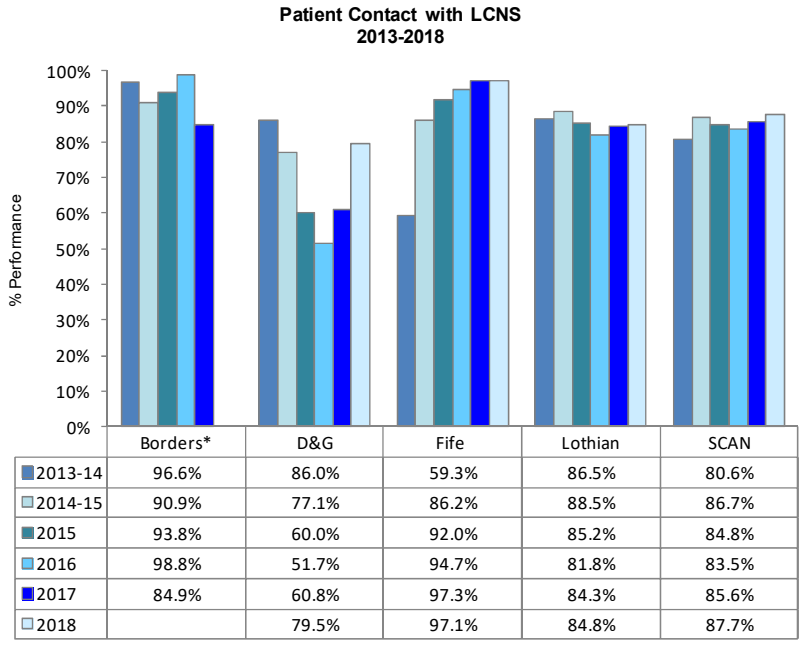
n = All patients diagnosed with Lung Cancer 01/01/2018 – 31/12/2018

10 year distribution		Borders	D&G	Fife	Lothian	SCAN
		n	n	n	n	n
≤49	M		1	0	8	9
	F		1	4	4	9
50-59	M		5	11	35	51
	F		12	15	28	55
60-69	M		20	49	80	149
	F		14	49	71	134
70-79	M		32	81	134	247
	F		28	67	156	251
80 +	M		14	36	76	126
	F		19	30	113	162
Totals			**146**	**342**	**705**	**1193**

Table 4 Lung Cancer Nurse Specialist

n = patients seen by Lung Cancer Nurse Specialist 01/01/2018 – 31/12/2018

	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
2018			116	79.5%	332	97.1%	598	84.8%	1046	87.7%



	Borders*	D&G	Fife	Lothian	SCAN
2013-14	96.6%	86.0%	59.3%	86.5%	80.6%
2014-15	90.9%	77.1%	86.2%	88.5%	86.7%
2015	93.8%	60.0%	92.0%	85.2%	84.8%
2016	98.8%	51.7%	94.7%	81.8%	83.5%
2017	84.9%	60.8%	97.3%	84.3%	85.6%
2018		79.5%	97.1%	84.8%	87.7%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

Comments

The NLCA[23] and the Lung Cancer Forum for Nurses agree that 90% of patients should have access to a LCNS at diagnosis and throughout their pathway. This is reinforced by the Scottish Cancer Plan which recommends all patients should have access to a Clinical Nurse Specialist; and NICE guidelines which recommend all patients have direct access to a LCNS for support throughout the cancer pathway. The Roy Castle Lung Cancer Foundation view the role of the LCNS as *crucial in the provision of optimal patient care; providing support from initial presentation, through investigations to diagnosis, to treatment and thereafter*.[24]

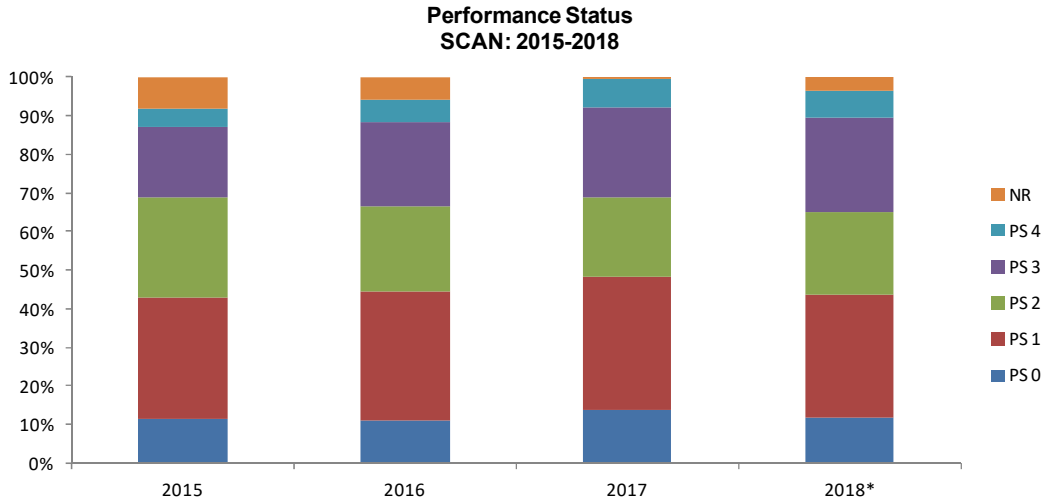
[23] NLCA: National Lung Cancer Audit

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

Table 5 Performance Status

n = All patients diagnosed with Lung Cancer 01/01/2018 – 31/12/2018

PS	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
0			18	15.5%	22	6.9%	98	15.1%	138	11.9%
1			45	38.8%	109	34.1%	218	33.7%	372	32.0%
2			21	18.1%	83	25.9%	144	22.3%	248	21.3%
3			29	25.0%	92	28.8%	161	24.9%	282	24.2%
4			14	12.1%	32	10.0%	36	5.6%	82	7.0%
Not recorded			19	16.4%	4	1.3%	48	7.4%	71	6.1%
Cohort			146		342		705		1193	



* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

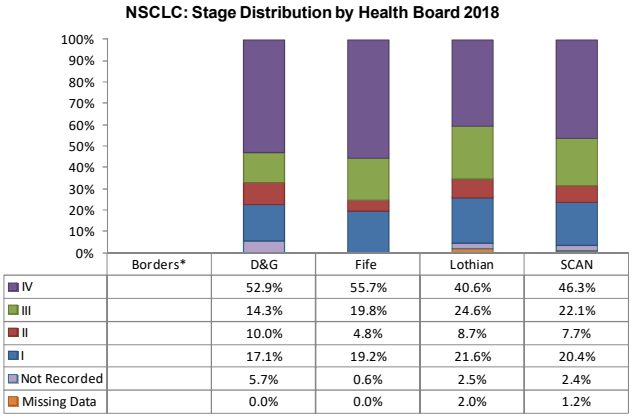
Comments

Performance Status (PS), in conjunction with staging, is a key parameter for the selection of optimal management.

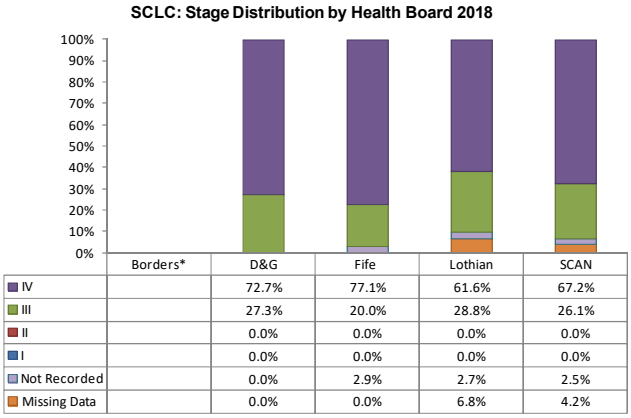
Table 6 Stage Distribution

n = All patients diagnosed with lung cancer 01/01/2018 to 31/12/2018

Stage	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
IA			10	6.8%	51	14.9%	124	17.6%	185	15.5%
IB			4	2.7%	19	5.6%	35	5.0%	58	4.9%
IIA			1	0.7%	4	1.2%	14	2.0%	19	1.6%
IIB			9	6.2%	16	4.7%	31	4.4%	56	4.7%
IIIA			10	6.8%	31	9.1%	65	9.2%	106	8.9%
IIIB			10	6.8%	32	9.4%	57	8.1%	99	8.3%
IIIC			9	6.2%	8	2.3%	29	4.1%	46	3.9%
IV (M1)			-	-	-	-	2	0.3%	2	0.2%
IVA			38	26.0%	67	19.6%	118	16.7%	223	18.7%
IVB			38	26.0%	111	32.5%	180	25.5%	329	27.6%
Not Recorded			17	11.6%	3	0.9%	31	4.4%	51	4.3%
Missing data			-	-	-	-	19	2.7%	19	1.6%
Cohort			146		342		705		1193	



	Borders*	D&G	Fife	Lothian	SCAN
IV		52.9%	55.7%	40.6%	46.3%
III		14.3%	19.8%	24.6%	22.1%
II		10.0%	4.8%	8.7%	7.7%
I		17.1%	19.2%	21.6%	20.4%
Not Recorded		5.7%	0.6%	2.5%	2.4%
Missing Data		0.0%	0.0%	2.0%	1.2%



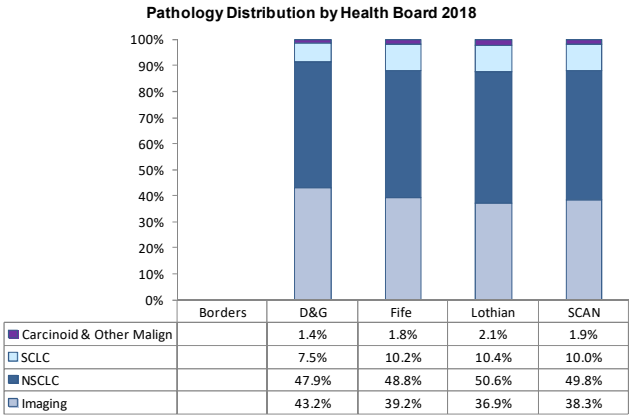
	Borders*	D&G	Fife	Lothian	SCAN
IV		72.7%	77.1%	61.6%	67.2%
III		27.3%	20.0%	28.8%	26.1%
II		0.0%	0.0%	0.0%	0.0%
I		0.0%	0.0%	0.0%	0.0%
Not Recorded		0.0%	2.9%	2.7%	2.5%
Missing Data		0.0%	0.0%	6.8%	4.2%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

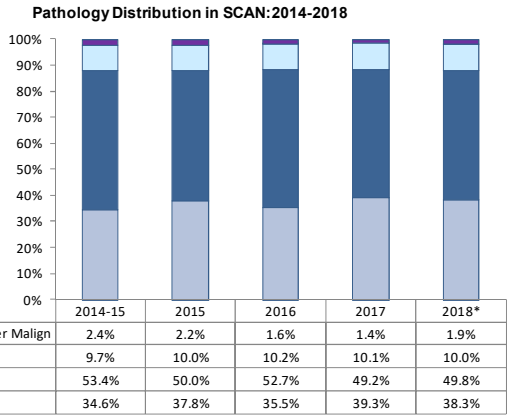
Table 7 Pathology Type

n = All patients diagnosed with Lung Cancer 01/01/2018 to 31/12/2018

Pathology Type	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
Squamous			18	12.3%	46	13.5%	125	17.7%	189	15.8%
Adenocarcinoma			50	34.2%	93	27.2%	191	27.1%	334	28.0%
NSCLC (NOS)			-	-	13	3.8%	21	3.0%	34	2.8%
Other specific NSCLC			1	0.7%	13	3.8%	15	2.1%	29	2.4%
NSCLC combination			1	0.7%	2	0.6%	5	0.7%	8	0.7%
SCLC			11	7.5%	34	9.9%	67	9.5%	112	9.4%
NSCLC/SCLC mixed			-	-	1	0.3%	6	0.9%	7	0.6%
Carcinoid			1	0.7%	3	0.9%	12	1.7%	16	1.3%
Other malignancy			1	0.7%	3	0.9%	3	0.4%	7	0.6%
Negative pathology			6	4.1%	20	5.8%	19	2.7%	45	3.8%
Declined investigation			8	5.5%	10	2.9%	11	1.6%	29	2.4%
No pathology			49	33.6%	104	30.4%	230	32.6%	383	32.1%
Not recorded	-	-	-	-	-	-	-	-	-	-
Pathology Diagnosis										
Total NSCLC			70	47.9%	167	48.8%	357	50.6%	594	49.8%
Total SCLC			11	7.5%	35	10.2%	73	10.4%	119	10.0%
Carcinoid & Other			2	1.4%	6	1.8%	15	2.1%	23	1.9%
Imaging Diagnosis			63	43.2%	134	39.2%	260	36.9%	457	38.3%



	Borders	D&G	Fife	Lothian	SCAN
Carcinoid & Other Malign		1.4%	1.8%	2.1%	1.9%
SCLC		7.5%	10.2%	10.4%	10.0%
NSCLC		47.9%	48.8%	50.6%	49.8%
Imaging		43.2%	39.2%	36.9%	38.3%



	2014-15	2015	2016	2017	2018*
Carcinoid & Other Malign	2.4%	2.2%	1.6%	1.4%	1.9%
SCLC	9.7%	10.0%	10.2%	10.1%	10.0%
NSCLC	53.4%	50.0%	52.7%	49.2%	49.8%
Imaging	34.6%	37.8%	35.5%	39.3%	38.3%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

Table 8 First Treatment Type

n = All patients diagnosed with Lung Cancer 01/01/2018 to 31/12/2018

First Treatment	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
Surgery			17	11.6%	36	10.5%	101	14.3%	154	12.9%
Radiotherapy			24	16.4%	63	18.4%	132	18.7%	219	18.4%
SABR			-	-	17	5.0%	*30	4.3%	47	3.9%
Chemoradiotherapy			4	2.7%	22	6.4%	29	4.1%	55	4.6%
Chemotherapy			16	11.0%	45	13.2%	61	8.7%	122	10.2%
Biological Therapy			7	4.8%	9	2.6%	28	4.0%	44	3.7%
Endoscopic			-	-	-	-	1	0.1%	1	0.1%
Best Supportive Care (BSC)			68	46.6%	121	35.4%	286	40.6%	475	39.8%
Watchful Waiting			4	2.7%	7	2.0%	11	1.6%	22	1.8%
Died before Treatment			3	2.1%	11	3.2%	14	2.0%	28	2.3%
Declined Therapies			3	2.1%	11	3.2%	12	1.7%	26	2.2%
Not Recorded			-	-	-	-	-	-	-	-
Cohort			146		342		705		1193	

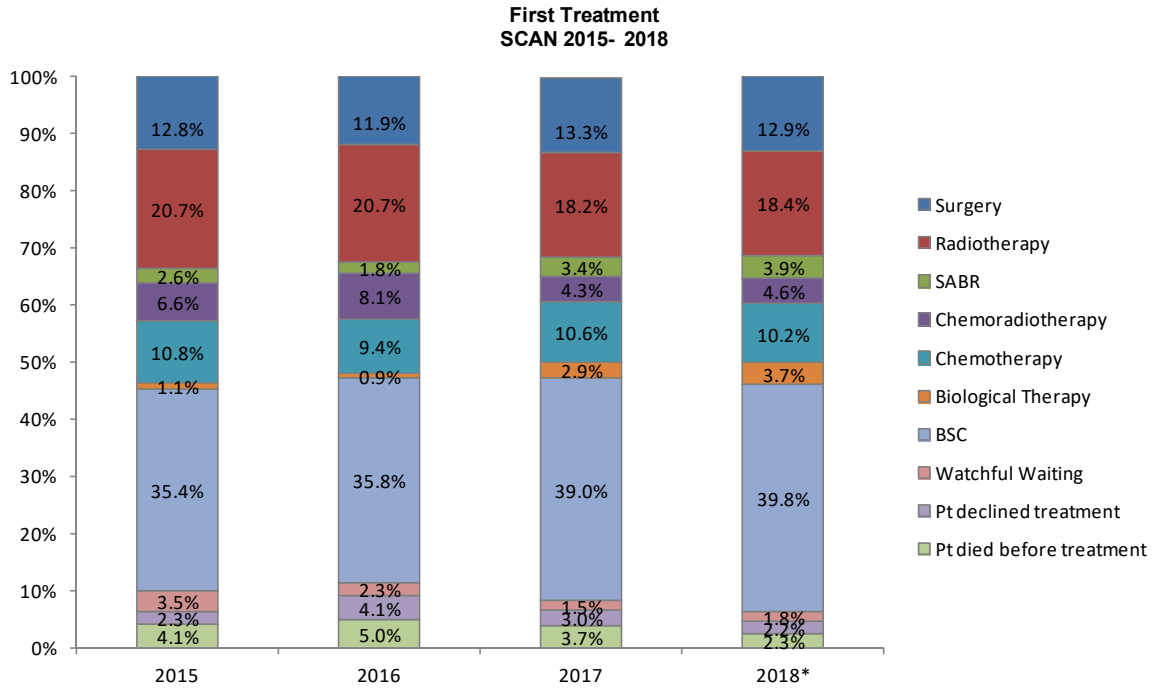
*NHS Lothian: SABR: 3 x brain & 27 x lung.

First Treatment is defined in the QPI Lung Cancer Dataset, Version 2.4: July 2015 as follows:

For any particular modality it is the first treatment and not specifically the definitive treatment i.e. this does not include purely diagnostic biopsies such as incisional biopsies, needle biopsies or core biopsies.

Record patients as having 'supportive care only' if a decision was taken not to give the patient any active treatment as part of their primary therapy. No active treatment includes watchful waiting and supportive care but not palliative chemotherapy and/or radiotherapy.

Dilatation without other treatment is not considered as active treatment. Steroids, drainage of pleural effusions etc should not be recorded as first treatment if more substantive treatment such as radiotherapy, chemotherapy or surgery is given. If no further treatment is given, then record as supportive care.



*NHS Borders data is currently unavailable for 2018 and will be reported in due course.

Table 9: Surgery: Non Small Cell Lung Cancer

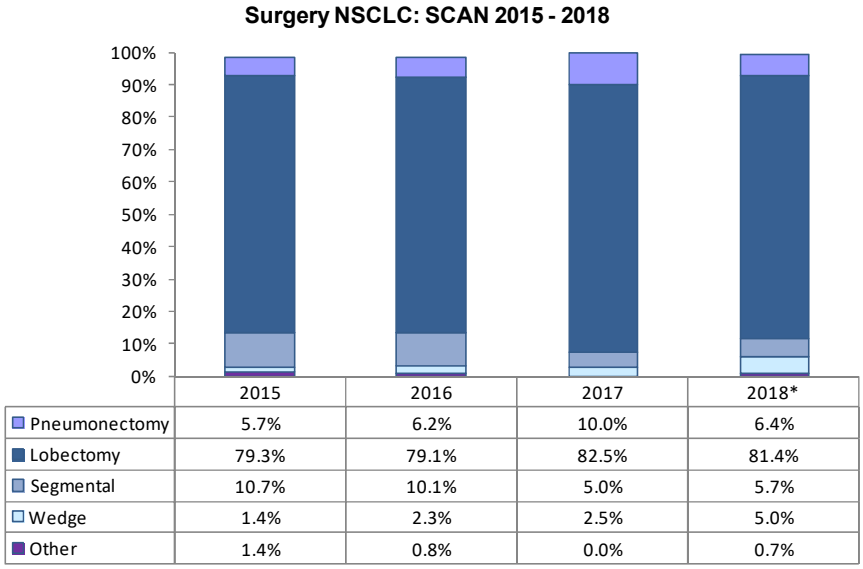
Table 9A: Surgery: NSCLC

n = all patients diagnosed with NSCLC[25] 01/01/2018 to 31/12/2018

Surgery	Borders n	Borders %	D&G n	D&G %	Fife n	Fife %	Lothian n	Lothian %	SCAN n	SCAN %
Pneumonectomy			1	5.9%	3	9.1%	5	5.6%	9	6.4%
Lobectomy			14	82.4%	27	81.8%	73	81.1%	114	81.4%
Wedge			2	11.8%	2	6.1%	3	3.3%	7	5.0%
Segmental			-	-	1	3.0%	7	7.8%	8	5.7%
Inoperable			-	-	-	-	1	1.1%	1	1.7%
Other			-	-	-	-	1	1.1%	1	1.7%
Not recorded			-	-	-	-	-	-	-	-
Cohort			17		33		90		140	

Comments

Wedge procedures should be kept to a minimum and any patients referred for surgical resection but only suitable for wedge resection should be re-evaluated. The patient should be referred back to MDT and the alternative, and less invasive, radiotherapy treatment SABR should be considered.



	2015	2016	2017	2018*
Pneumonectomy	5.7%	6.2%	10.0%	6.4%
Lobectomy	79.3%	79.1%	82.5%	81.4%
Segmental	10.7%	10.1%	5.0%	5.7%
Wedge	1.4%	2.3%	2.5%	5.0%
Other	1.4%	0.8%	0.0%	0.7%

* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

Table 9B: Surgery: NSCLC, Stages I-II

2018 is the first year of reporting NSCLC Stages I-II under Key Categories.

n = all patients diagnosed with NSCLC, Stages I-II 01/01/2018 to 31/12/2018

Surgery	Borders n	Borders %	D&G n	D&G %	Fife n	Fife %	Lothian n	Lothian %	SCAN n	SCAN %
Pneumonectomy			-	-	3	9.1%	3	3.4%	6	4.3%
Lobectomy			12	70.6%	26	78.8%	63	70.8%	101	72.7%
Wedge			2	11.8%	2	6.1%	3	3.4%	7	5.0%
Segmental			-	-	1	3.0%	6	6.7%	7	5.0%
Other			-	-	-	-	-	-	-	-
Inoperable			5	29.4%	-	-	-	-	5	3.6%
Not recorded			-	-	-	-	-	-	-	-
Cohort			19		32		75		126	

[25] QPI exclusions have not been applied: see QPI 6.1 and 6.2 for QPI results.

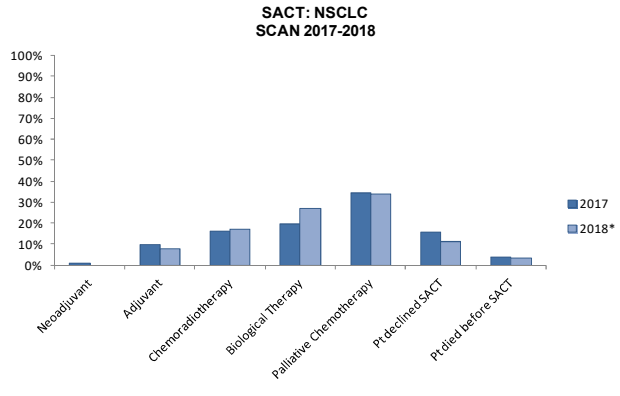
Table 10 Systemic Anti Cancer Treatment (SACT)
This is the first year of reporting SACT as part of key categories.

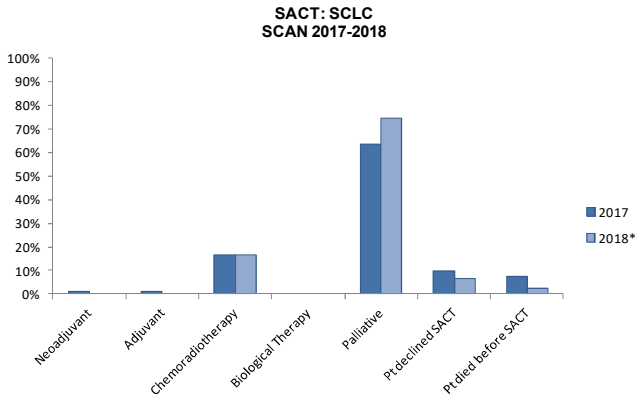
Table 10 (a) SACT: Non Small Cell Lung Cancer (NSCLC)
n = All patients diagnosed with NSCLC who received SACT (First or subsequent treatments) 01/01/2018 to 31/12/2018

SACT: NSCLC	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
Neoadjuvant			-	-	-	-	-	-	-	-
Adjuvant			3	8.8%	2	2.6%	14	10.5%	19	7.8%
Chemoradiotherapy			3	8.8%	16	20.5%	23	17.3%	42	17.1%
Biological Therapy			10	29.4%	16	20.5%	40	30.1%	66	26.9%
Pall chemotherapy			13	38.2%	32	41.0%	38	28.6%	83	33.9%
Pt died before SACT			1	2.9%	4	5.1%	3	2.3%	8	3.3%
Declined SACT			4	11.8%	8	10.3%	15	11.3%	27	11.0%
Not recorded			-	-	-	-	-	-	-	-

Table 10 (b) SACT: Small Cell Lung Cancer (SCLC)
n = All patients diagnosed with SCLC who received SACT (First or subsequent treatments) 01/01/2018 to 31/12/2018

SACT: NSCLC	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
Neoadjuvant			-	-	-	-	-	-	-	-
Adjuvant			-	-	-	-	-	-	-	-
Chemoradiotherapy			1	14.3%	6	23.1%	6	13.3%	13	16.7%
Biological Therapy			-	-	-	-	-	-	-	-
Pall chemotherapy			6	85.7%	19	73.1%	33	73.3%	58	74.4%
Pt died before SACT			-	-	1	3.8%	1	2.2%	2	2.6%
Declined SACT			-	-	-	-	5	11.1%	5	6.4%
Not recorded			-	-	-	-	-	-	-	-





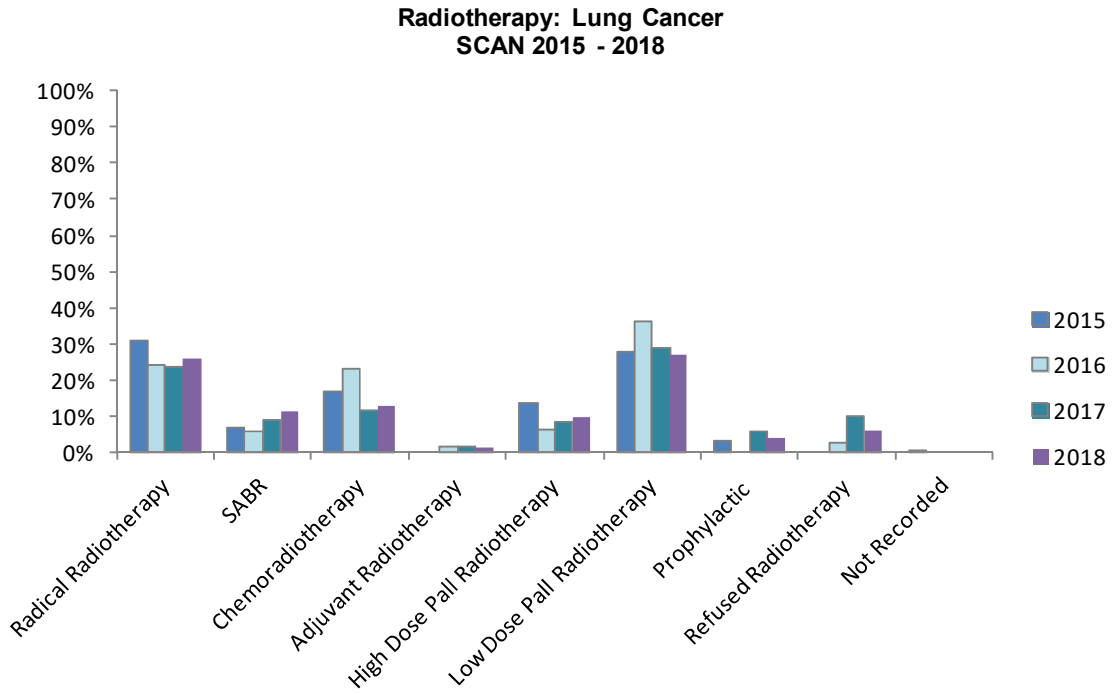
* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

Table 11 Radiotherapy

n = All patients diagnosed with Lung Cancer who received Radiotherapy (First or subsequent treatments) 01/01/2018 to 31/12/2018

Radiotherapy	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
Radical radiotherapy			11	29.7%	27	20.3%	72	28.9%	110	26.3%
SABR			-	-	17	12.8%	31	12.4%	48	11.5%
Chemoradiotherapy			4	10.8%	22	16.5%	29	11.6%	55	13.1%
Adjuvant radiotherapy			-	-	2	1.5%	4	1.6%	6	1.4%
Low dose palliative			4	10.8%	41	30.8%	69	27.7%	114	27.2%
High dose palliative			17	45.9%	7	5.3%	18	7.2%	42	10.0%
Prophylactic			1	2.7%	6	4.5%	11	4.4%	18	4.3%
Declined radiotherapy			-	-	11	8.3%	15	6.0%	26	6.2%
Not recorded			-	-	-	-	-	-	-	-

Type of Radiotherapy	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
Radical			15	40.5%	68	51.1%	136	54.6%	219	52.3%
Palliative			21	56.8%	48	36.1%	87	34.9%	156	37.2%



* NHS Borders data is currently unavailable for 2018 and will be reported in due course.

Appendices
Appendix 1: Historical QPI Attainment Summary – 2017

QPI Attainment Summary – 2017			Target%	Borders		D&G		Fife		Lothian		SCAN	
QPI 1 MDT discussion before definitive treatment			95	N 98 D 101	97.0%	N 115 D 120	95.8%	N 309 D 320	96.6%	N 593 D 620	95.6%	N 1115 D 1161	96.0%
QPI 2 Pathological Diagnosis	All patients with lung cancer		80	N 59 D 96	61.5%	N 77 D 106	72.6%	N 189 D 316	59.8%	N 424 D 676	62.7%	N 749 D 1194	62.7%
	NSCLC with sub-type identified		90	N 43 D 48	89.6%	N 57 D 62	91.9%	N 146 D 161	90.7%	N 312 D 341	91.5%	N 558 D 612	91.2%
	Non squamous IIIB-IV: molecular profiling		75	N 16 D 21	76.2%	N 22 D 26	84.6%	N 67 D 78	85.9%	N 107 D 129	82.9%	N 212 D 254	83.5%
QPI 4 Patients being treated with curative intent who have a PET/CT before treatment			95	N 22 D 24	91.7%	N 23 D 23	100%	N 57 D 58	98.3%	N 160 D 168	95.2%	N 262 D 273	96.0%
*QPI 6 Surgical resection in NSCLC patients		All NSCLC	20	N 14 D 48	29.2%	N 16 D 61	26.2%	N 28 D 146	19.2%	N 102 D 334	30.5%	N 160 D 589	23.9%
		NSCLC Stage I-II	60	N 9 D 10	90.9%	N 9 D 13	69.2%	N 25 D 36	69.4%	N 87 D 118	73.7%	N 130 D 177	73.4%
*QPI 7 Lymph node assessment for NSCLC patients having pneumonectomy or lobectomy			80	Analysis is by Hospital of Surgery: RIE						N 137 D 165	83.0%	N D	n/a
QPI 8 Radiotherapy (including SABR) for inoperable lung cancer			35	N 13 D 28	46.4%	N 10 D 31	32.3%	N 45 D 111	40.5%	N 110 D 239	46.0%	N 178 D 409	43.5%
QPI 9 Chemoradiotherapy for locally advanced NSCLC			50	N 1 D 3	33.3%	N 3 D 3	100%	N 5 D 7	71.4%	N 8 D 17	47.1%	N 17 D 30	56.7%
QPI 10 Chemoradiotherapy for Limited (Ltd) SCLC			70	N 1 D 4	25.0%	N 4 D 4	100%	N 3 D 4	75.0%	N 2 D 8	25.0%	N 10 D 20	50.0%
QPI 11 SACT for patients with inoperable NSCLC		All types of SACT for NSCLC	35	N 17 D 29	58.6%	N 18 D 40	45.0%	N 49 D 120	40.8%	N 85 D 222	38.3%	N 169 D 411	41.1%
		Biological therapy for NSCLC stage IIIB-IV, PS 0-1	60	N 0 D 0	n/a	N 2 D 2	100%	N 3 D 3	100%	N 15 D 17	88.2%	N 20 D 22	90.9%
QPI 12 SACT for patients with SCLC	All types of chemotherapy for SCLC		70	N 9 D 10	90.0%	N 10 D 11	90.9%	N 18 D 26	69.2%	N 38 D 59	64.4%	N 75 D 106	70.8%
	Palliative chemotherapy for SCLC patients having treatment with non-curative intent		50	N 6 D 7	85.7%	N 5 D 6	83.3%	N 13 D 21	61.9%	N 33 D 52	63.5%	N 57 D 86	66.3%

QPI Attainment Summary – 2017		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 192 1.6%	N D n/a
	Radical Radiotherapy	<5	N 0 D 11 0%	N 0 D 6 0%	N 0 D 33 0%	N 0 D 101 0%	N 0 D 151 0%
	Adjuvant Chemotherapy	<5	N 0 D 4 0%	N 0 D 3 0%	N 0 D 2 0%	N 0 D 14 0%	N 0 D 23 0%
	Chemoradiotherapy	<5	N 0 D 8 0%	N 1 D 9 11.1%	N 0 D 14 0%	N 0 D 21 0%	N 1 D 52 1.9%
	Palliative Chemotherapy (NSCLC)	<10	N 0 D 12 0%	N 0 D 10 0%	N 3 D 27 11.1%	N 3 D 35 8.6%	N 6 D 84 7.1%
	Palliative Chemotherapy (SCLC)	<15	N 2 D 6 33.3%	N 1 D 5 20.0%	N 1 D 14 7.1%	N 3 D 31 9.7%	N 7 D 56 12.5%
	Biological Therapy (NSCLC)	<10	N 0 D 3 0%	N 0 D 4 0%	N 0 D 9 0%	N 0 D 34 0%	N 0 D 50 0%
*QPI 13.2 90 Day Mortality After Treatment	*Surgery	<5	Analysis is by Hospital of Surgery: RIE			N 5 D 181 2.8%	N D n/a
	Radical Radiotherapy	<5	N 0 D 11 0%	N 0 D 6 0%	N 2 D 30 6.7%	N 4 D 99 4.0%	N 6 D 146 4.1%
	Chemoradiotherapy	<5	N 3 D 8 37.5%	N 1 D 8 12.5%	N 0 D 13 0%	N 1 D 15 6.7%	N 5 D 44 11.4%
QPI 14 SABR for Inoperable Lung Cancer with Stage I Disease		35	N 2 D 4 50.0%	N 2 D 4 50.0%	N 8 D 25 32.0%	N 26 D 66 39.4%	N 38 D 99 38.4%
QPI 15 Cytological/Pathological Diagnosis Prior to Treatment	Surgery	75	N 4 D 14 28.6%	N 6 D 15 40.0%	N 19 D 29 65.5%	N 73 D 107 68.2%	N 102 D 165 61.8%
	Radical Radiotherapy	75	N 6 D 11 54.5%	N 3 D 5 60.0%	N 18 D 31 58.1%	N 58 D 102 56.9%	N 85 D 149 57.0%
	Chemoradiotherapy	75	N 8 D 8 100%	N 9 D 9 100%	N 17 D 17 100%	N 21 D 21 100%	N 55 D 55 100%
QPI 16 Contrast CT/MRI for N2 Pts Prior to Curative Treatment		95	N 5 D 13 38.5%	N 5 D 6 83.3%	N 5 D 9 55.6%	N 22 D 33 66.7%	N 37 D 61 60.7%
QPI Clinical Trials N: patients consented to trials/research study and held on SCRN database.		15	N 0 D 106 0%	N 0 D 120 0%	N 1 D 337 0.3%	N 24 D 682 3.5%	N 25 D 1245 2.0%

QPI Attainment Summary – 2017	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 report for QPIs 6(i), 6(ii), 7, 13.1(i) and 13.2(i).
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 these QPIs and are marked as being not applicable.

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 2: Glossary

AKI (Acute Kidney Injury)
A sudden loss of kidney function that develops over a few days or weeks.

Adenocarcinoma
This type of cancer develops from glandular cells which produce mucus in the lining of the airways. This is classified as a type of non-small cell lung cancer.

Adjuvant Therapy
A treatment given in addition to the main or primary treatment (for example, chemotherapy given after surgery) to try to prevent a cancer recurring.

AF (Atrial Fibrillation)
is caused by abnormal electrical discharges (signals) that generate chaotically throughout the upper chambers of the heart. It reduces the ability of the atria to pump blood into the ventricles, and usually causes the heart to beat too rapidly

Anti-cancer Treatment
Anti-cancer treatment includes any form of radiotherapy, chemotherapy, and/or surgery. It excludes best supportive care and watchful waiting. Treatments such as stenting and steroids that are not followed by surgery, chemotherapy or radiotherapy are regarded as best supportive care/no active treatment.

ARDS (Acute Respiratory Distress Syndrome)
In ARDS there is respiratory failure of sudden (acute) onset due to the rapid accumulation of fluid in the lungs (pulmonary oedema) following an abrupt increase in the permeability of the normal barrier between the capillaries and the air sacs in the lungs. ARDS is the most serious response to acute lung injury.

Audit
Audit is the measurement and evaluation of care against best practice with a view to improving current practice and care delivery.

Biopsy
A biopsy is a small tissue sample taken for microscopic examination and diagnosis.

Bronchoscopy
An examination used for inspection of the interior of the tracheo-bronchial tree, performance of endobronchial diagnostic tests, taking of specimens for biopsy and culture, and removal of foreign bodies.

BSC
Best Supportive Care or palliative care with medicines given to control any symptoms. See also **palliative care**.

CABG (Coronary Artery Bypass Graft) Surgery
Surgery for significant narrowings or blockages of the heart arteries.

Cancer
The name given to a group of diseases that can occur in any organ of the body, and in blood, and which involve abnormal or uncontrolled growth of cells.

Carcinoid
A carcinoid tumour is a rare, mostly slow growing, type of neuroendocrine tumour.

Case Ascertainment (Estimated)
Number of cases recorded as a proportion of those expected using the average of the most recent available five years reported in the Scottish Cancer Registry.

Chemotherapy
The use of drugs that destroy cancer cells, or prevent or slow their growth.

Chemoradiation
Term used to describe chemotherapy and radiotherapy used in combination. This can be adjuvant, neoadjuvant or concurrent.

CKD (Chronic Kidney Disease)
A general terms to indicate that kidneys are damaged, diseased or not functioning correctly and have been that way for a while.

Co-morbidity
The condition of having two or more diseases at the same time.

Concurrent Therapy
A treatment that it given at the same time as another treatment.

Consolidation Radiotherapy
Treatment to stop the cancer coming back once it is in remission. The aim is to kill any remaining cancerous cells.

COPD (Chronic Obstructive Pulmonary Disease)
Chronic Obstructive Pulmonary Disease is the name for a collection of lung diseases including chronic bronchitis, emphysema and chronic obstructive airways disease.

CT Guided Lung FNA / Biopsy
A Computed Tomography scan is used to accurately locate the abnormality and mark a spot on the chest through which the biopsy needle will be passed to obtain FNA (fine needle aspirate/fluid) or biopsy for pathological diagnosis.

CT (Computed Tomography) Scan
An X-ray imaging technique used in diagnosis that can reveal many soft tissue structures not shown by conventional radiography. A computer is used to assimilate multiple X-ray images into a two-dimensional cross-sectional image.

CVA (Cerebrovascular Accident)
Is the medical term for a stroke.

Cytology/Cytological
The study of the structure and function of cells under the microscope, and of their abnormalities.

Diagnosis
Confirmation of the presence of the disease.

Dyspnoea
Sudden shortness of breath, or breathing difficulty.

EBUS
Endobronchial Ultrasound is a form of bronchoscopy where the bronchoscope is fitted with an ultrasound probe which allows visualisation and sampling of mediastinal and hilar lymph nodes.

EXT SCLC (Extensive Small Cell Lung Cancer)
The cancer has spread outside the lung, within the chest area or to other parts of the body. TNM Stage IV is equivalent to extensive disease.

EOL care
End of life care.

FNA Biopsy
Fine needle aspiration biopsy involves the extraction of cells in fluid through a fine needle for microscopic examination and diagnosis.

Glomerular filtration rate (GFR)
is a test used to check how well the kidneys are working. Specifically, it estimates how much blood passes through the glomeruli each minute. Glomeruli are the tiny filters in the kidneys that filter waste from the blood.

GRO Records
General Register Office Records provide official government information on births, marriages and deaths.

Hepatomegaly
The abnormal enlargement of the liver.

Histology/Histological
The study of cells and tissue on the microscopic level.

IPF (Idiopathic Pulmonary Fibrosis
A specific form of aggressive fibrosing interstitial lung disease that can cause pneumonia.

Interstitial Lung Disease
A group of diseases that have thickening of the supportive tissues between the air sacs of the lungs.

Large Cell Carcinoma
Consists of large, rounds cells which are seen under the microscope. It is sometimes known as undifferentiated carcinoma. This is classified as a type of non-small cell lung cancer.

LCNS (Lung Cancer Nurse Specialist)
A Lung Cancer Nurse Specialist is a first level nurse, locally recognised as part of the specialist lung cancer multidisciplinary team and designated as a specialist in lung cancer. The nurse should spend at least 50% of his or her time caring for lung cancer patients. It is recognised that the Lung Cancer Nurse Specialist may be practising within a sub speciality of oncology, respiratory nursing, thoracic nursing or specialist palliative care. [*National Lung Cancer Forum*].

LTD SCLC (Limited Small Cell Lung Cancer)
Limited disease is cancer that can only be seen in one lung, in nearby lymph nodes or in fluid around the lung (pleural effusion). TNM Stages I, II and III aggregated are equivalent to limited disease.

Lobe/Lobes
A section of an organ. The right lung has three lobes and the left has two.

Lobectomy
The surgical removal of a lobe of the lung.

LRTI (Lower Respiratory Tract Infection)
Lower respiratory tract infections are any infections in the lungs or below the voice box. These include pneumonia, bronchitis, and tuberculosis.

Managed Clinical Network (MCN)
A formally organised network of clinicians. The main function is to audit performance on the basis of standards and guidelines, with the aim of improving healthcare across a wide geographic area, or for specific conditions.

MDM
The Multi-Disciplinary Meeting of the MDT.

MDT: Multi-Disciplinary Team
A multi-professional group of people from different disciplines (both healthcare and non-healthcare) who work together to agree best treatment options and provide optimal care for patients.

Mixed NSCLC
Includes lung cancer with mixed NSCLC components e.g. adenosquamous.

Neoadjuvant Therapy
Treatment given as the first step to shrink the tumour prior to the main treatment.

Neuroendocrine Tumours
Neuroendocrine tumours (NETs) are rare cancers. The commonest type is carcinoid tumour, which grows most often in the appendix and small bowel, but may occur in other parts of the digestive system, lung, pancreas, kidney, ovaries and testicles.

NLCA
National Lung Cancer Audit which reports on patients diagnosed in England and Wales and to which Scotland contributes data (https://www.rcplondon.ac.uk/projects/national-lung-cancer-audit).

NSCLC (Non-Small Cell Lung Cancer)
A group of lung cancers that are named for the kinds of cells and how the cells look under a microscope. The three main types are squamous cell carcinoma; large cell carcinoma; and adenocarcinoma. Other types include mixed components and NSCLC (not otherwise specified (NOS)). NSCLC is the most common kind of lung cancer.

NSCLC (NOS)
Non-small cell lung cancer (not otherwise specified) includes undifferentiated carcinoma and large cell undifferentiated which cannot be further specified.

Other Malignancy
To describe lung cancers reported as "malignant cells' or 'carcinoma (not otherwise specified)'.

Other Specific NSCLC
This accounts for other specific NSCLC including salivary-type carcinomas.

Outcome
The end result of care and treatment and/or rehabilitation: the change in health, functional ability, symptoms or situation of a person, which can be used to measure the effectiveness of care and treatment, and/or rehabilitation.

Palliative Care
Palliative care is the active total care of patients and their families by a multi-professional team when the patient's disease is no longer responsive to curative treatment.

Palliative Radiotherapy
When it is not possible to cure a cancer, radiotherapy can be given to alleviate symptoms and improve quality of life. Lower doses are given than for curative or radical radiotherapy and generally over a shorter period of time.

Pathology
The study of disease processes with the aim of understanding their nature and causes. Observation of samples of fluid and tissues obtained from the living patient by various methods, or at a post mortem.

Pathological Diagnosis
The microscopic examination (histological or cytological) of specimens by a pathologist to determine the presence of malignancy and the classification of the malignant tumour.

PCI (Prophylactic Cranial Irradiation)
Radiation therapy to the brain to prevent cancer seeding.

PE (Pulmonary Embolism)
A sudden blockage of a lung artery which usually happens when a when a blood clot breaks loose and travels through the bloodstream to the lungs.

Pneumonectomy
An operation to remove an entire lung.

Primary Tumour
Original site of the cancer. The mass of tumour cells at the original site of abnormal tissue growth.

PS: (WHO [World Health Organisation] Performance Status)
Performance Status is an overall assessment of the functional/physical performance of the patient (see Appendix 3 for further details).

Radical Radiotherapy
Radiotherapy is given with the aim of destroying cancer cells to attain cure.

Resection
Surgical removal of a portion of any part of the body.

SABR (Stereotactic Ablative Radiotherapy)
Radiotherapy given from many different directions to target the tumour more accurately. It is less invasive treatment with curative intent for patients with NSCLC who are not fit for surgery.

SCLC (Small Cell Lung Cancer)
A type of lung cancer in which the cells are small and round.

Segmentectomy
Removal of part of the lung less than a lobe. See **lobe**.

Squamous Cell Carcinoma
This is the commonest type of lung cancer. It develops in the cells which line the airways.

Staging
The process of determining whether cancer has spread. Staging involves clinical, surgical, radiological and pathological assessment (see Appendices 4 and 5 for further details).

STEMI (ST-Elevation Myocardial Infarction) is a very serious type of heart attack during which one of the heart's major arteries is blocked.

SVCO (Superior Vena Cava Obstruction) The superior vena cava is a large vein in the chest which carries blood from the upper half of the body into the heart. SVCO happens when this blood flow is blocked and is usually caused by lung cancer near to this vein.

Thoracic
Relating to the chest.

TIA (Transient Ischaemic Attack)
A transient ischaemic attack or "mini stroke" is caused by a temporary disruption in the blood supply to part of the brain.

TNM Classification
TNM classification provides a system for staging the extent of cancer. T refers to the size and position of the primary tumour. N refers to the involvement of the lymph nodes. M refers to the presence or absence of distant metastases (see Appendices 4 and 5).

Tumour
An abnormal mass of tissue. A tumour may be either benign (not cancerous) or malignant. A tumour is also known as a neoplasm.

Undifferentiated
Undifferentiated is a term used to describe very immature cells that are not specialised. If a cancer cell is completely undifferentiated, it may not be possible to tell its origin.

Wedge
A surgically removed triangle-shaped portion of lung containing a tumour and a small amount of normal tissue around it. A tissue wedge may also be removed for biopsy.

Appendix 3: Performance Status

WHO/ECOG PERFORMANCE STATUS (PS) CATEGORIES

0	Fully active. Able to carry on all pre-disease performance without restriction.
1	Restricted in physically strenuous activities but ambulatory and able to carry out work of a light and sedentary nature.
2	Ambulatory and capable of all self-care but unable to carry out many work activities; up and about more than 50% waking hours.
3	Capable of only limited self-care; confined to bed or a chair for more than 50% of waking hours.
4	Completely disabled; unable to carry out any self-care; totally confined to bed or a chair.

Appendix 4: TNM 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 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

TNM Stage Comparison
TNM 8th Edition implemented 01/01/2018 (black font) 7th Edition, pre 2018 (blue font).

8TH EDITION	7TH EDITION	N0	N1	N2	N3
T1a 0-1cm	T1a	IA1 (IA)	IIB (IIA)	IIIA	IIIB
T1b >1-2cm		IA2 (IA)	IIB (IIA)	IIIA	IIIB
T1c >2-3cm	T1b	IA3 (IA)	IIB (IIA)	IIIA	IIIB
T2a>3-4cm	T2a	IB	IIB (IIA)	IIIA	IIIB
T2b >4-5cm		IIA (IB)	IIB (IIA)	IIIA	IIIB
T3 >5-7cm	T2b	IIB (IIA)	IIIA (IIB)	IIIB (IIIA)	IIIC (IIIB)
T4 >7cm	T3	IIIA (IIB)	IIIA	IIIB (IIIA)	IIIC (IIIB)
M1a	M1a	IVA (IV)	IVA (IV)	IVA (IV)	IVA (IV)
M1b	M1b	IVA (IV)	IVA (IV)	IVA (IV)	IVA (IV)
M1c	M1b	IVB(IV)	IVB(IV)	IVB(IV)	IVB(IV)

Appendix 6: Acknowledgements

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