

**West of Scotland Cancer Network
Lung Cancer
Managed Clinical Network**



Audit Report

Lung Quality Performance Indicators

**Clinical Audit Data:
01 January 2020 to 31 December 2020**

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CONTENTS

EXECUTIVE SUMMARY	4
1. INTRODUCTION	12
2. BACKGROUND	12
2.1 NATIONAL CONTEXT	13
2.2 WEST OF SCOTLAND CONTEXT	14
3. METHODOLOGY	16
4. RESULTS AND ACTION REQUIRED	16
5. NEXT STEPS	44
ACKNOWLEDGEMENT	45
ABBREVIATIONS	46
APPENDIX 1: META DATA	49
APPENDIX 2: CANCER AUDIT TIMELINE	50
APPENDIX 3: ACTION IMPROVEMENT PLAN	505

Lung Cancer Quality Performance Indicators

Patients Diagnosed: January 2020 - December 2020

Number Diagnosed:

2184

Case Ascertainment:

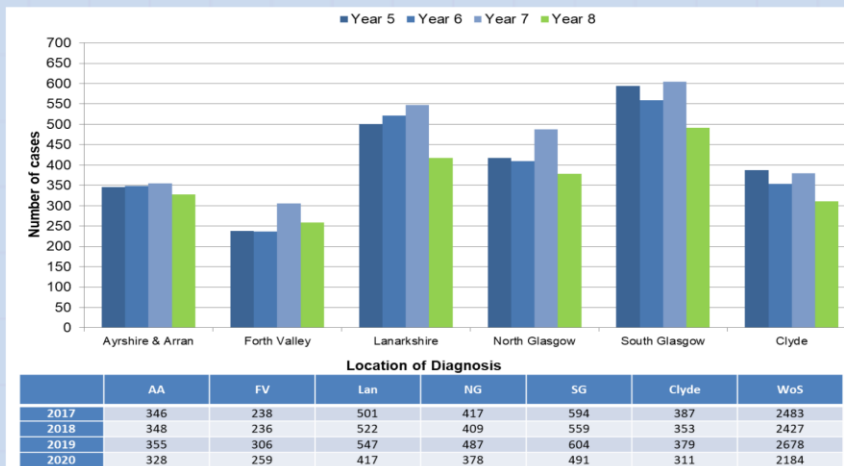
78.6%

Male

47.8%

Female

52.2%



QPI Results

QPI Target	QPI Results	WoS Result	Met/Not Met
QPI 1: MDT Discussion	95%	99.2%	✓
QPI 2: Pathological Diagnosis	80%	79.6%	✓
QPI 2ii: NSCLC Subtype	90%	92.7%	✓
QPI 2iv: PDL-1 Testing	75%	93.2%	✓
QPI 6i: NSCLC Surgical Resection	20%	29.0%	✓
QPI 6ii: NSCLC Stage I-II Surgical Resection	60%	76.1%	✓
QPI 7: Lymph Node Assessment	80%	90.3%	✓
QPI 8: RT in Inoperable Lung	35%	48.6%	✓
QPI 9: CRT in Locally Adv. NSCLC	50%	37.9%	✗
QPI 10: CRT in Limited Stage SCLC	70%	60.0%	✗
QPI 12i: CRT in SCLC	70%	79.0%	✓
QPI 12ii: Palliative Chemo SCLC	60%	74.4%	✓
QPI 13i: 30/90day Surg Mortality	<5%	0.9% / 1.5%	✓ ✓
QPI 13: 30/90day Rad Radio Mortality	<5%	1.6% / 4.9%	✓ ✓
QPI 13: 30/90day CRT Mortality	<5%	2.8% / 7.1%	✓ ✗
QPI 14: SABR	35%	41.9%	✓
QPI 15: PreTreat Diag - Surgery	75%	58.6%	✗
QPI 15: PreTreat Diag - Rad Radio	75%	57.5%	✗
QPI 16: Brain Imaging	95%	81.5%	✗
QPI 17: Clinical Trials	15%	0.3%	✗

Key Achievements

QPI results indicate that overall the quality of lung cancer services across the WoS is good. Particular areas of note include:-

- QPI 1: MDT Discussion. Significant improvement observed in the Clyde sector as a result of improvements in surgical attendance at the Clyde MDT.
- QPI 2(iv): PD-L1 testing undertaken in 93% of stage III-IV NSCLC patients to inform treatment decision making.
- QPI 6(i): Consistent rates of surgical resection across the region in patients with non small cell lung cancer.
- QPI 7: Adequate sampling of lymph nodes performed with all units exceeding the 80% QPI target.
- QPI 13: Low mortality rates observed following surgery, chemotherapy and chemoradiotherapy

Areas for Improvement

MCN will coordinate further regional analysis to better understand variance in performance in relation to:-

- QPI 8:- Radical Radiotherapy in Non Surgical Patients.
- QPI 14:- SABR in Inoperable Stage I Lung Cancer.
- QPI 15:- Pre-Treatment Diagnosis.
- QPI 16:- Brain imaging.

Executive Summary

Introduction

This report presents an assessment of performance of West of Scotland (WoS) Lung Cancer Services relating to patients diagnosed in the region between 01 January 2020 and 31 December 2020. Data was measured against v4.0 of the Lung Cancer Quality Performance Indicators (QPIs)¹. This was the eighth consecutive year of analysis following the initial Healthcare Improvement Scotland (HIS) publication of Lung cancer QPIs in 2012.

In order to ensure the success of the Cancer QPIs in driving quality improvement in cancer care, QPIs will continue to be assessed and amended to ensure they remain clinically effective and relevant. The initial formal review of the Lung Cancer QPIs took place in 2016. Following a second cycle of review v4.0 QPI definitions were published in February 2021. These clinically led reviews involve key clinicians from each of the Regional Cancer Networks.

Results

Results for each QPI are shown in detail in the main report and illustrate Board performance against each target and overall WoS performance for each performance indicator. Results are presented graphically and the accompanying tabular format also highlights any missing data and its possible effect on any of the measured outcomes. Additional narrative and clinical commentary is also provided in the main report to explain some of the apparent variances in performance.

A summary of the Lung Cancer Quality Performance Indicators for the patients diagnosed in 2020 is presented below. Data are analysed by location of diagnosis and illustrate Board performance against each target and overall regional performance for each performance indicator.

As patients within NHS Greater Glasgow and Clyde are managed by 4 MDTs, the NHSGGC figures are also shown broken down by analysis group - North Glasgow (Glasgow Royal Infirmary and Stobhill), South Glasgow (Queen Elizabeth University Hospital, New Victoria Hospital and Gartnavel General Hospital), and Clyde (Royal Alexandra Hospital, Vale of Leven Hospital, and Inverclyde Royal Hospital).

3 Year Summary of Lung Cancer QPI Results

Lung Cancer QPI Performance Summary Report

Clinical Leads:	
Date:	
Audit Reporting Period:	01/01/2020 – 31/12/2020

Key	
	Above Target Result
	Below Target Result
-	No comparable measure for previous years

Quality Performance Indicator (QPI)	Performance by NHS Board								
	Target	Year	AA	FV	Lan	NG	SG	Clyde	WoS
QPI 1: Proportion of patients with lung cancer who are discussed at MDT meeting.	95%	2020	99.7%	99.2%	99.5%	100%	99.0%	97.7%	99.2%
		2019	94.2%	96.3%	96.6%	95.4%	97.1%	60.7%	91.1%
		2018	94.9%	93.5%	97.3%	94.7%	94.5%	61.0%	90.2%
QPI 2(i): Proportion of patients with lung cancer who have a pathological diagnosis.	80%	2020	75.1%	79.5%	82.4%	82.2%	78.9%	79.0%	79.6%
		2019	69.0%	63.4%	72.0%	74.6%	69.0%	73.3%	70.6%
		2018	73.2%	63.6%	77.0%	76.1%	63.1%	69.0%	70.7%
QPI 2(ii): Proportion of patients with a pathological diagnosis of non-small cell lung cancer (NSCLC) who have tumour subtype identified.	90%	2020	96.8%	86.4%	94.5%	93.1%	93.1%	89.6%	92.7%
		2019	95.8%	90.8%	93.8%	90.5%	91.6%	91.4%	92.3%
		2018	96.4%	91.2%	94.9%	87.4%	93.8%	91.4%	92.7%

(-) dash denotes a denominator of less than 5. Figures have been removed to ensure confidentiality.

Quality Performance Indicator (QPI)	Performance by NHS Board								
	Target	Year	AA	FV	Lan	NG	SG	Clyde	WoS
QPI 2(iv): Proportion of patients with a pathological diagnosis of stage III-IV NSCLC who have PD-L1 testing undertaken.	75%	2020	98.1%	84.6%	93.0%	94.3%	92.3%	94.6%	93.1%
		2019							
		2018							
QPI 6(i): Proportion of patients with NSCLC who undergo surgical resection.	20%	2020	27.2%	26.3%	30.6%	35.6%	24.9%	28.0%	29.0%
		2019	27.7%	30.6%	34.4%	34.5%	27.3%	22.3%	29.8%
		2018	31.3%	15.8%	27.8%	32.9%	27.6%	22.5%	27.4%
QPI 6(ii): Proportion of patients with stage I – II NSCLC who undergo surgical resection.	60%	2020	75.0%	74.3%	75.0%	81.4%	73.4%	73.0%	76.1%
		2019	89.8%	77.4%	82.7%	78.7%	85.7%	73.3%	81.7%
		2018	93.2%	60.0%	87.5%	75.4%	81.4%	64.9%	80.4%
QPI 7: Proportion of patients with NSCLC undergoing surgery who have adequate sampling of lymph nodes performed at time of surgical resection or at previous mediastinoscopy.	80%	2020	94.7%	91.7%	96.1%	86.0%	84.5%	93.1%	90.3%
		2019	86.0%	97.5%	94.2%	86.3%	88.3%	89.2%	90.2%
		2018	94.3%	80.0%	89.7%	86.6%	81.0%	91.7%	87.7%
QPI 8: Proportion of patients with lung cancer not undergoing surgery who receive radiotherapy with radical intent (54Gy or greater) ± chemotherapy, or SABR.	35%	2020	49.3%	20.4%	49.3%	56.4%	55.7%	46.8%	48.6%
		2019	31.8%	24.2%	37.8%	41.6%	37.4%	37.5%	36.0%
		2018	36.6%	16.3%	34.6%	44.3%	37.8%	23.0%	33.4%

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Quality Performance Indicator (QPI)	Performance by NHS Board								
	Target	Year	AA	FV	Lan	NG	SG	Clyde	WoS
QPI 9: Proportion of patients with NSCLC not undergoing surgery who receive radical radiotherapy, to 54Gy or greater, and concurrent or sequential chemotherapy.	50%	2020	-	n/a	20.0%	50.0%	50.0%	-	37.9%
		2019	-	-	28.6%	66.7%	77.8%	50.0%	54.1%
		2018	-	-	-	66.7%	87.5%	-	58.3%
QPI 10: Proportion of patients with limited stage SCLC treated with radical intent who receive both platinum-based chemotherapy, and radiotherapy to 40Gy or greater.	70%	2020	-	-	-	-	-	n/a	60.0%
		2019	-	-	50.0%	57.1%	63.6%	58.8%	56.9%
		2018	66.7%	0.0%	42.9%	80.0%	38.9%	-	50.8%
QPI 12(i): Proportion of patients with SCLC who receive chemotherapy ± radiotherapy.	70%	2020	85.2%	75.0%	82.4%	71.4%	83.0%	75.7%	79.0%
		2019	83.9%	86.2%	78.2%	74.5%	79.4%	78.6%	79.4%
		2018	94.4%	58.3%	80.4%	64.1%	84.9%	71.4%	77.2%
QPI 12(ii): Proportion of patients with SCLC not undergoing treatment with curative intent who receive palliative chemotherapy.	50%	2020	76.2%	77.8%	79.3%	64.3%	77.1%	72.4%	74.4%
		2019	78.3%	85.7%	72.3%	69.2%	75.9%	69.2%	74.7%
		2018	91.7%	54.5%	75.0%	51.6%	81.4%	65.7%	70.9%
QPI 13: 30 day mortality (surgery). Proportion of patients with lung cancer who die within 30 days of surgery for lung cancer.	< 5%	2020	0.0%	0.0%	1.5%	0.0%	1.6%	2.4%	0.9%
		2019	1.8%	0.0%	1.0%	0.0%	2.1%	2.0%	1.1%
		2018	0.0%	0.0%	0.0%	1.2%	1.3%	0.0%	0.5%

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Quality Performance Indicator (QPI)	Performance by NHS Board								
	Target	Year	AA	FV	Lan	NG	SG	Clyde	WoS
QPI 13: 90 day mortality (surgery). Proportion of patients with lung cancer who die within 90 days of surgery for lung cancer.	< 5%	2020	0.0%	2.8%	1.5%	1.3%	1.6%	2.5%	1.5%
		2019	1.8%	2.0%	2.0%	1.0%	2.1%	2.0%	1.8%
		2018	1.7%	0.0%	0.0%	3.8%	1.3%	0.0%	1.4%
QPI 13: 30 day mortality (radical radiotherapy). Proportion of patients with lung cancer who die within 30 days of radical radiotherapy for lung cancer.	< 5%	2020	0.0%	0.0%	2.3%	1.8%	0.0%	5.6%	1.6%
		2019	3.4%	0.0%	2.3%	0.0%	0.0%	2.2%	1.2%
		2018	0.0%	0.0%	0.0%	3.9%	1.4%	3.6%	1.7%
QPI 13: 90 day mortality (radical radiotherapy). Proportion of patients with lung cancer who die within 90 days of radical radiotherapy for lung cancer	< 5%	2020	3.1%	6.7%	4.9%	3.6%	4.2%	9.1%	4.9%
		2019	6.9%	4.8%	9.3%	4.4%	5.6%	6.5%	6.3%
		2018	5.6%	0.0%	7.1%	5.9%	6.9%	3.7%	5.7%
QPI 13: 30 day mortality (chemoradiotherapy). Proportion of patients with lung cancer who die within 30 days of chemoradiotherapy for lung cancer.	< 5%	2020	0.0%	-	10.0%	0.0%	4.0%	0.0%	2.8%
		2019							
		2018							
QPI 13: 90 day mortality (chemoradiotherapy). Proportion of patients with lung cancer who die within 90 days of chemoradiotherapy for lung cancer.	< 5%	2020	0.0%	-	10.0%	0.0%	12.0%	12.5%	7.1%
		2019							
		2018							

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Quality Performance Indicator (QPI)	Performance by NHS Board								
	Target	Year	AA	FV	Lan	NG	SG	Clyde	WoS
QPI 14: SABR in inoperable stage I lung cancer. Proportion of patients with stage I lung cancer not undergoing surgery who receive SABR.	35%	2020	50.0%	17.4%	34.5%	47.9%	45.2%	43.2%	41.9%
		2019	44.8%	22.7%	28.2%	38.3%	33.8%	41.0%	35.3%
		2018	55.0%	13.0%	55.9%	47.8%	44.9%	17.1%	40.7%
QPI 15(i): Pre-treatment Diagnosis. Proportion of patients who receive curative treatment that have a histological/cytological diagnosis prior to surgery.	75%	2020	52.2%	60.0%	54.7%	55.3%	73.4%	53.7%	58.6%
		2019	45.6%	37.3%	55.9%	58.8%	67.0%	56.9%	55.5%
		2018	60.3%	47.4%	64.0%	40.7%	62.3%	80.0%	58.7%
QPI 15(ii): Pre-treatment Diagnosis. Proportion of patients who receive curative treatment that have a histological/cytological diagnosis prior to radical radiotherapy.	75%	2020	60.0%	73.3%	76.2%	47.3%	52.2%	52.8%	57.5%
		2019	48.3%	90.0%	79.1%	62.2%	53.6%	82.2%	66.9%
		2018	42.9%	63.6%	69.0%	62.0%	52.1%	75.0%	60.1%
QPI 16: Brain Imaging. Proportion of patients with N2 disease who receive curative treatment that undergo contrast enhanced CT or contrast enhanced MRI prior to start of treatment.	95%	2020	42.9%	37.5%	100%	93.3%	91.3%	75.0%	81.5%
		2019	41.7%	45.5%	100.0%	81.0%	72.7%	60.0%	70.4%
		2018	17.6%	12.5%	83.3%	53.3%	68.0%	58.3%	55.4%
QPI 17: Clinical Trial Access Proportion of patients diagnosed with lung cancer who are consented for a clinical trial / research study.	15%	2020	0.0%	0.0%	0.2%	0.5%			0.3%
		2019	0.5%	0.0%	0.7%	1.2%			0.9%
		2018	1.0%	3.9%	1.6%	1.6%			1.8%

(-) dash denotes a denominator of less than 5. Figures have been removed to ensure confidentiality.

Conclusions and Action Required

Cancer audit has underpinned much of the regional development and service improvement work of the MCN. Regular reporting of activity and performance have been fundamental in assuring the quality of care delivered across the region. Following the initial development of QPIs in 2012, it has now become a firmly established national programme which drives continuous improvement and ensures equity of care for patients across Scotland.

West of Scotland Boards' commitment to the improvement of the quality and completeness of audit data has provided continued support to the National Cancer Quality Programme. This on-going commitment from Boards has provided accurate data for the reporting of performance against the Lung Cancer QPIs, and enabled comparisons in service provision across WoS Boards to be made.

The 2020 results demonstrate that on the whole, performance across the West of Scotland has remained good or improved further, with patients across the region continuing to receive a high standard of care. Particular areas of strong service performance were seen across the network in relation to: MDT meetings, surgical resection rate, sampling of lymph nodes, brain imagining, post-surgical mortality and post chemoradiotherapy mortality.

Some variance in performance was evident across the region, even if targets were met. As per the agreed regional governance process when performance is below the QPI target, NHS Boards were asked to review possible reasons for this and provide a detailed response. It is acknowledged that the covid-19 pandemic and the impact that it had on service provision will likely have had an impact on the ability of NHS boards to meet QPI targets.

Whilst the MCN will actively progress any regional actions identified, NHS Boards are asked to develop local Improvement Plans in response to the findings presented in this report, these are detailed within the appropriate NHS Board Action Plan templates in Appendix 3.

Action Required:

QPI 8: Radiotherapy in inoperable lung cancer.

- The provision of all annual data in one report makes timely review by clinicians in advance of publication challenging and leaves no opportunity to monitor and improve performance during the running year. NHS FV to ensure quarterly reports are made available for review by clinicians.
- The MCN will work with NHS FV to review /analyse MDT decision making regarding radical treatment and potential factors influencing this, and determine if further action is possible to improve radical treatment rates.

QPI 14: Stereotactic Ablative Radiotherapy (SABR) in inoperable stage I lung cancer.

- Lung team in BWoSCC to review the disparity around the administration of radiotherapy across the region.

QPI 15: Pre Treatment Diagnosis.

- MCN to consider the requirement for a formalised pathway for interventional radiology as part of the ongoing work to explore the possibility of a single diagnostic centre for the region.

QPI 16: Brain Imaging.

- NHS AA and FV to adopt the revised MDT form with 'pop up' prompt regarding brain imaging.

Completed Action Plans should be returned to WoSCAN within two months of publication of this report.

Progress against these plans will be monitored by the MCN Advisory Board and any service or clinical issue which the Advisory Board considers not to have been adequately addressed will be escalated to the NHS Board Territorial Lead Cancer Clinician and Regional Lead Cancer Clinician.

Additionally, progress will be reported annually to the Regional Cancer Advisory Group (RCAG) by NHS Board Territorial Lead Cancer Clinicians and MCN Clinical Leads, and nationally on a three-yearly basis to Healthcare Improvement Scotland as part of the governance processes set out in CEL 06 (2012).

1. Introduction

This report presents an assessment of performance of West of Scotland (WoS) Lung Cancer Services relating to patients diagnosed in the region between 01 January 2020 and 31 December 2020. These audit data underpin much of the regional development/service improvement work of the Managed Clinical Network (MCN) and regular reporting of activity and performance is a fundamental requirement of an MCN to assure the quality of care delivered across the region.

In order to ensure the success of the Cancer QPIs in driving quality improvement in cancer care, QPIs will continue to be assessed and amended to ensure they remain clinically effective and relevant. The initial formal review of the Lung Cancer QPIs took place in 2016. Following a second cycle of review v4.0 QPI definitions were published in February 2021 with changes implemented for patients diagnosed from January 2020. These clinically led reviews involve key clinicians from each of the Regional Cancer Networks.

2. Background

Lung cancer patients usually present to a respiratory physician, although a significant sub group are referred by other clinicians, e.g. care of the elderly, and increasingly there is cross referral to lung cancer Multidisciplinary Team (MDT) meetings.

There are 7 lung cancer MDTs which operate around 8 outpatient clinics serving 2.5 million people across four NHS Boards - NHS Ayrshire & Arran, NHS Forth Valley, NHS Greater Glasgow and Clyde (NHSGGC), and NHS Lanarkshire. Surgical services are provided centrally at the Golden Jubilee National Hospital (GJNH).

Table 1 lists the MDTs by NHS Board area, and includes the analysis group based on location of diagnosis, which has been used to present results throughout the report.

Table 1: Lung Cancer MDT Configuration in the WoS

MDT	Analysis Group (location of diagnosis)	NHS Board Area
Crosshouse & Ayr	Ayrshire & Arran (AA)	NHS Ayrshire & Arran
Forth Valley Royal Hospital	Forth Valley (FV)	NHS Forth Valley
Pan Lanarkshire	Lanarkshire (LS)	NHS Lanarkshire
Clyde	Clyde (Clyde)	NHS Greater Glasgow and Clyde
North East Glasgow	North Glasgow (NG)	
West Glasgow	South Glasgow (SG)	
South Glasgow		

2.1 National Context

Lung cancer continues to be the most common cancer (16.1% of all cancers) in Scotland, with approximately 5,500 new cases diagnosed each year⁽²⁾. Nationally lung cancer accounts for 15.8% of male cancer patients and 16.5% of female cancer patients⁽²⁾. Lung cancer incidence rates in females continue to rise with a 2.4% increase over the last ten years; in contrast the long term decline in incidence of male lung cancer has continued with a significant fall in incidence of 19.4% over the same time period⁽¹⁾.

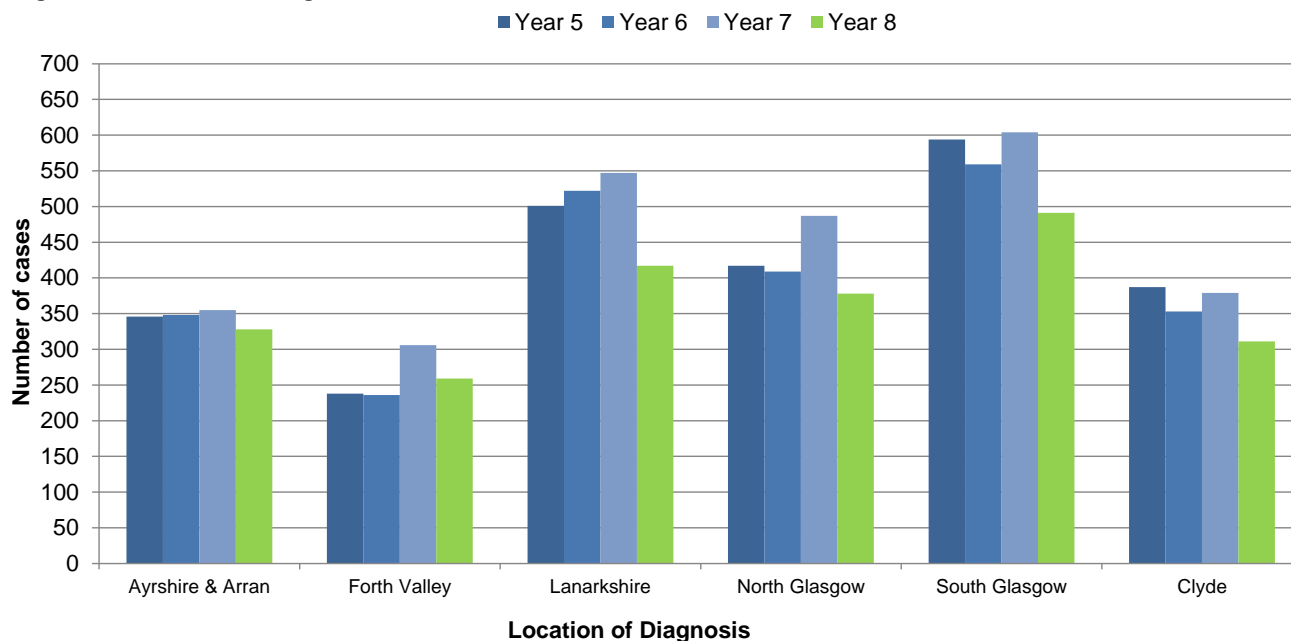
Overall cancer mortality rates have decreased in Scotland by 12.4% in males and 6.27% in females over the last 10 years. The mortality rate for females with lung cancer has decreased by 9.4% and by 25.2% for males, despite this, lung cancer continues to have the highest annual mortality rate of all cancers in Scotland⁽²⁾.

Regardless of more patients having opportunities for anti-cancer therapy beyond initial treatment, second and third line treatments are now available; the low survival rate is often attributed to advanced stage of disease at presentation. Data shows that for patients diagnosed between 2013 – 2017 1 year net survival was 35.2% in males and 41.7% in females, 5 year net survival drops to 11.1% and 16.3% for males and females respectively⁽³⁾.

2.2 West of Scotland Context

A total of 2184 cases of lung cancer were recorded through audit as diagnosed in the WoS in 2020. The number of patients diagnosed within each NHS Board is presented in Figure 1.

Figure 1: Distribution of Lung Cancer Cases in the WoS



	AA	FV	Lan	NG	SG	Clyde	WoS
Year 5_2017	346	238	501	417	594	387	2483
Year 6_2018	348	236	522	409	559	353	2427
Year 7_2019	355	306	547	487	604	379	2678
Year 8_2020	328	259	417	378	491	311	2184

There was an 18% decline in numbers of patients being diagnosed with lung cancer in the West of Scotland in 2020 compared with 2019. This is likely to be largely due to the impact of the COVID-19 pandemic, with the first lockdown coinciding with this audit period. There is emerging evidence of considerable declines in numbers of patients being diagnosed with cancer in 2020, particularly during April – June 2020, across a range of different cancer types.

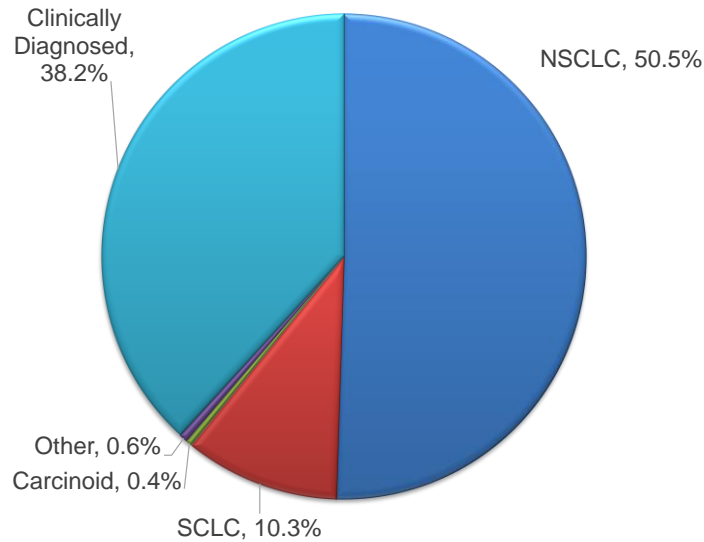
Age and Gender Distribution

As above there were 2,184 new diagnoses of cancer recorded in the WoS in 2020. Of these 1,044 (48%) diagnosed were male and 1,140 (52%) female. Lung cancer continues to be more prevalent in patients aged 60 years and over with 87% of the total cases occurring in patients within this group.

Types of Lung Cancer

Of the lung cancer cases diagnosed in 2020 around 10% were small cell lung cancers (SCLC) and 51% were non-small cell lung cancers (NSCLC). The remaining cases of lung cancer recorded were made up of classifications shown in Figure 2.

Figure 2: Types of Lung Cancer in the WoS



Stage at Diagnosis

Staging is the assessment of the extent of disease and is performed for prognostic and therapeutic purposes. TNM 8 staging was used to stage all lung cancers during 2020.

Figure 3: Stage at Diagnosis of Lung Cancer Patients

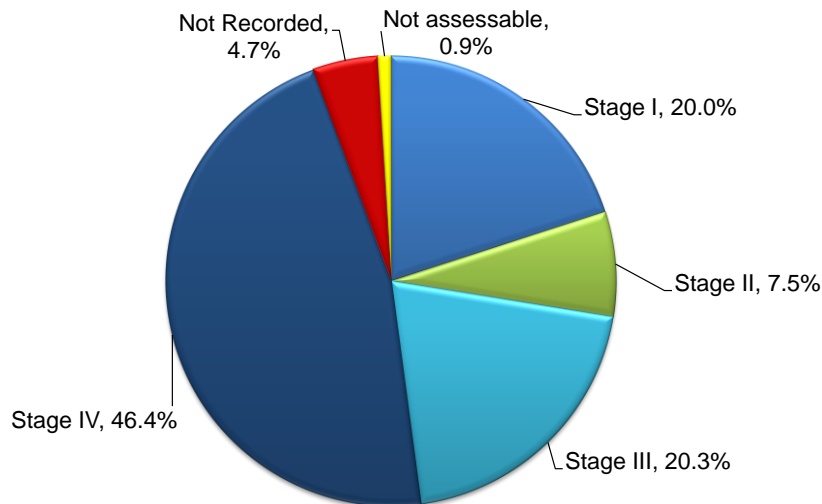
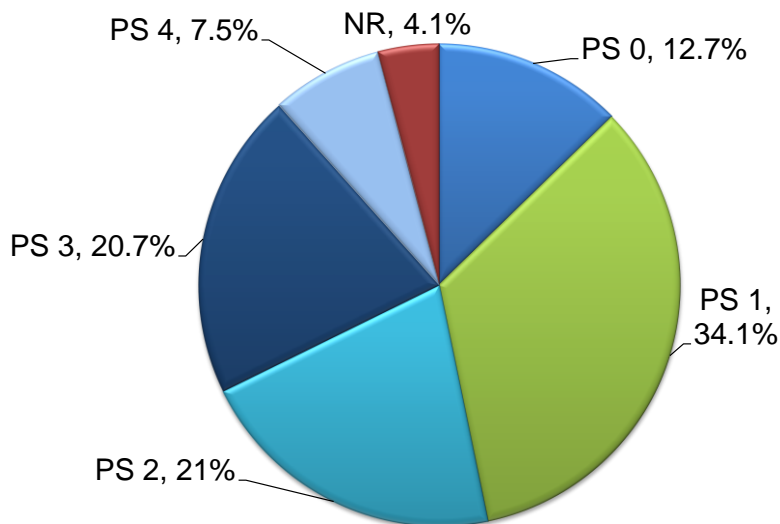


Figure 3 shows the presenting stage distribution of all lung cancer patients; 66.7% of patients in the WoS presented with advanced disease, stage III or IV.

Performance Status

Figure 4 shows the pre-treatment WHO/ECOG performance status distribution of all lung cancer patients; 28% of patients in the WoS presented with poor performance status, 3 or 4.

Figure 4: Performance Status of Lung Cancer Patients



3. Methodology

Further detail on the audit and analysis methodology and data quality is available in the meta data within appendix 1.

4. Results and Action Required

4.1 Performance against Quality Performance Indicators (QPIs)

Results of the analysis of Lung Cancer QPIs are set out in the following sections. Graphs and charts have been provided where this aids interpretation and, where appropriate, numbers have also been included to provide context. Where possible, and with consideration given to any changes after formal review, results for patients diagnosed in Year 8 have been presented alongside the previous years' results to illustrate trends.

Data (both graphically and in tabular format) are presented by location of diagnosis or location of treatment with some criteria given as an overall WoS representation. Boards have already reviewed cases where targets have not been met, and the detailed clinical commentary provided by Boards is noted beside each measure along with details of any specific changes that have already been implemented to address issues highlighted through the analysis.

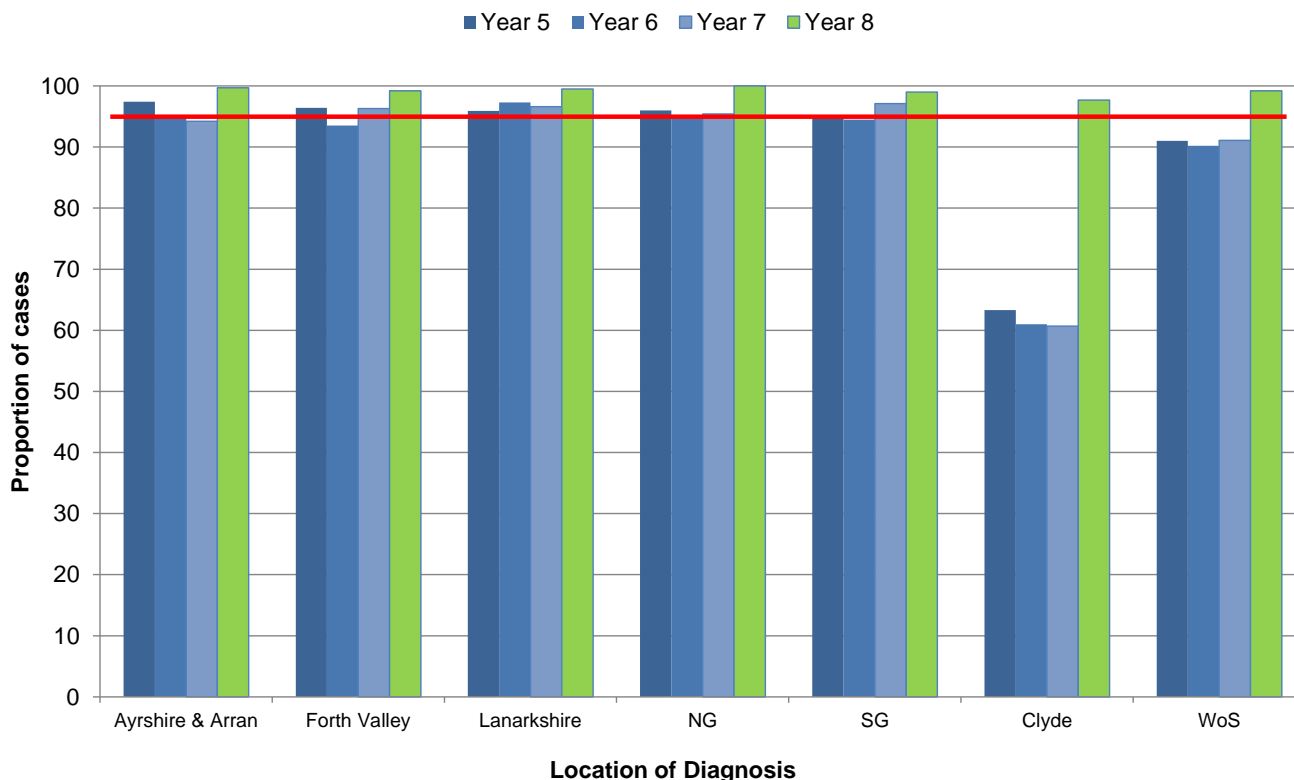
Where the number of cases meeting the denominator criteria for any indicator is between one and four, the percentage calculation has not been shown on any associated charts or tables. This is to avoid any unwarranted variation associated with small numbers and to minimise the risk of disclosure. Any charts or tables impacted by this are denoted with a dash (-). Any commentary provided by NHS Boards relating to the impacted indicators will however be included as a record of continuous improvement. An asterisk (*) is applied to indicate a denominator of zero and to distinguish between this and a 0% performance.

QPI 1: Multi-Disciplinary (MDT) Meeting

Effective MDT working is considered integral to provision of high quality lung cancer care, facilitating a cohesive treatment-planning function and ensuring treatment and care provision is individualised to patient needs¹. QPI 1 states that 95% of patients should be discussed at the MDT.

Title:	Patients with newly diagnosed lung cancer should be discussed by a MDT.
Numerator:	Number of patients with lung cancer discussed at the MDT.
Denominator:	All patients with diagnosed lung cancer.
Exclusions:	No exclusions.
Target:	95% or above

Figure 5: The proportion of patients discussed at MDT.



QPI 1 Target: 95%	AA	FV	Lan	NG	SG	Clyde	WoS
Performance (%)	99.7%	99.2%	99.5%	100%	99.0%	97.7%	99.2%
Numerator	327	257	415	378	486	304	2167
Denominator	328	259	417	378	491	311	2184
NR numerator	0	0	0	0	0	0	0
NR exclusions	0	0	0	0	0	0	0
NR denominator	0	0	0	0	0	0	0

Following formal review the requirement for discussion ‘prior to definitive treatment’ was removed in order to account for all patients being discussed including those who die before treatment or receive urgent treatment.

Overall in the WoS 99.2% of patients diagnosed with lung cancer were discussed at MDT, achieving the 95% target. All units achieved the target with NHSGGC Clyde sector showing significant

improvement on previous years. In previous years the Clyde sector was flagged as an outlier due to formally recording patients as “not discussed at MDT” if the meeting was not attended by all disciplines required to facilitate full discussion of management options. Work was undertaken by the Board to improve surgical attendance at MDT and attendance has now improved and is evident in the QPI result.

QPI 2 (i), (ii) and (iii): Pathological Diagnosis

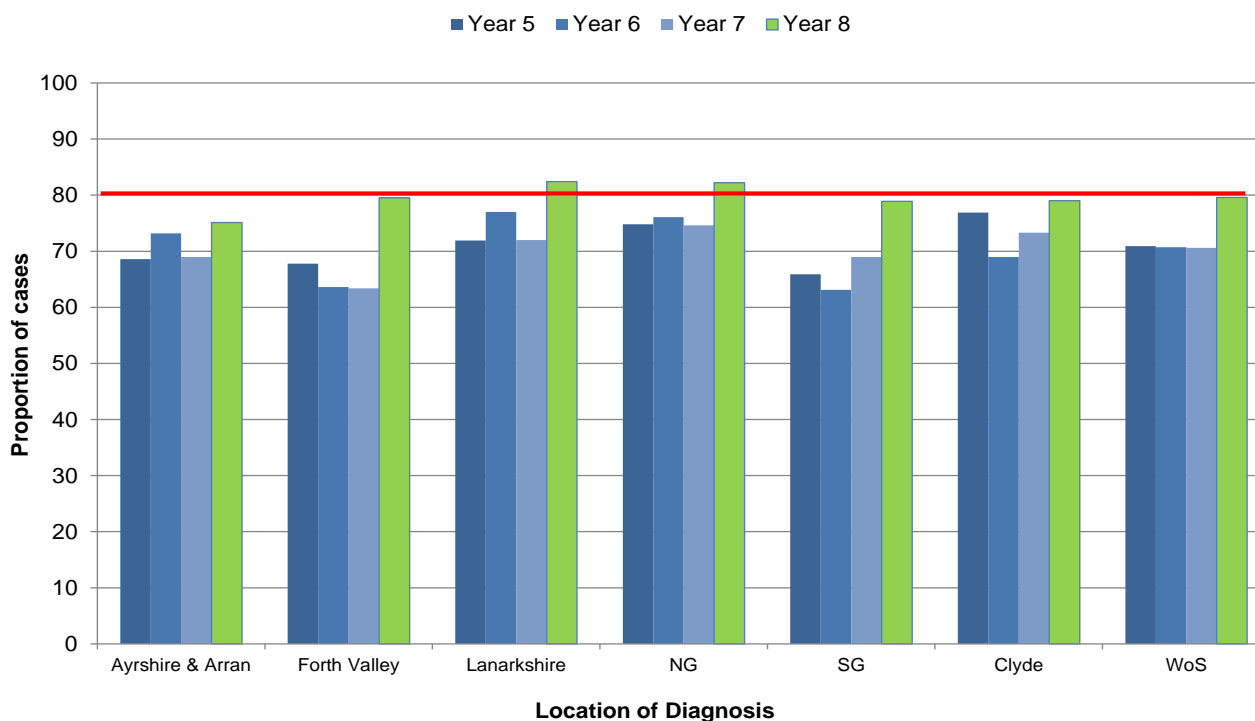
A definitive diagnosis is valuable in helping inform patients and carers about the nature of the disease, the likely prognosis and treatment choice¹.

Appropriate treatment of lung cancer depends on accurate diagnosis and distinction between histological types of lung cancer. Adequate tissue sampling should be undertaken, ensuring appropriate balance of risk to patients, to allow for pathological diagnosis including tumour sub-typing and molecular profiling. Newer drug treatments for Non Small Cell Lung Cancer (NSCLC) work best if they are targeted on the basis of histological sub-type and/or molecular profiling. These markers predict whether targeted treatments are likely to be effective and include, for example, epidermal growth factor receptor mutations¹.

QPI 2 is split into 4 sub-groups. The first group looks at all patients with lung cancer who have a pathological diagnosis. The target for this QPI is set at 80% and the tolerance within the target is designed to take account of the fact that it is not always appropriate, safe or possible to obtain a histological or cytological diagnosis due to the performance status of the patient or advanced nature of the disease. In patients where pathological diagnosis is appropriate this should be achieved wherever possible.

Title:	(i): Patients with lung cancer who have a pathological diagnosis.
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 Patients with Performance status 3 or 4
Target:	80% or above

Figure 6: The proportion of patients who have a pathological diagnosis of lung cancer.



QPI 2(i) Target: 80%	AA	FV	Lan	NG	SG	Clyde	WoS
Performance (%)	75.1%	79.5%	82.4%	82.2%	78.9%	79.0%	79.6%
Numerator	175	128	220	212	262	166	1163
Denominator	233	161	267	258	332	210	1461
NR numerator	0	0	0	0	0	0	0
NR exclusions	4	13	28	6	19	8	78
NR denominator	0	0	0	0	0	0	0

Following formal review the QPI was updated to exclude patients with performance status 3 and 4. The exclusion of these patients may contribute to the improved performance noted across all Boards.

Of the 1461 patients in this cohort during Year 8, 1163 had a pathological diagnosis. This equates to a rate of 79.6% against the target rate of 80%.

NHS Ayrshire & Arran reviewed all cases not meeting. Reasons provided included patients having SABR, patients with co-morbidities, patients for best supportive care only and patients having emergency treatment. The Board added that pathology is always attempted where possible/practical.

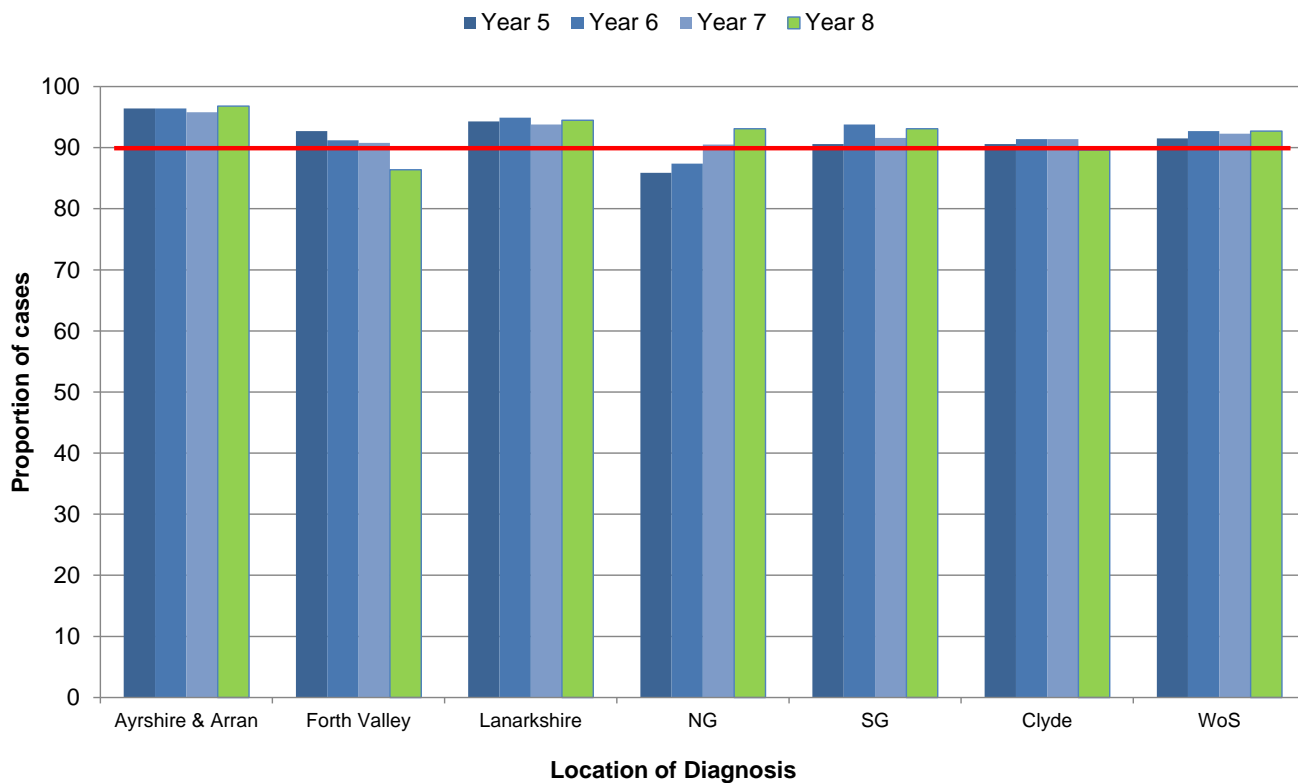
NHS Forth Valley commented that all cases not meeting the QPI criteria have been reviewed and were clinically managed appropriately. The Board will continue to review and emphasise recording of performance status.

The South Glasgow sector reported that all patients have been reviewed and all have valid reasons ranging from attempted but negative histology, procedure not tolerated, contraindicated due to co-morbidity and/or performance status, not technically possible due to size/position or clinical risk and 4 patients that were not sampled due to the COVID-19 pandemic.

The Clyde sector commented that the target was missed by 1% and results are comparable with the rest of NHSGGC. Valid clinical reasons were provided to explain why there was no pathological diagnosis. Reasons include patients that were not fit for investigations, biopsy attempted but negative pathology, biopsy technically not possible, or that pathological confirmation would not have altered patients' management.

Title:	(ii): Patients with a pathological diagnosis of non small cell lung cancer (NSCLC) who have tumour subtype identified
Numerator:	Number of patients with a pathological diagnosis of NSCLC who have a tumour subtype identified.
Denominator:	All patients with a pathological diagnosis of NSCLC.
Exclusions:	No exclusions
Target:	90% or above

Figure 7: The proportion of patients with a pathological diagnosis of NSCLC who have tumour subtype identified.



QPI 2(ii) Target: 90%	AA	FV	Lan	NG	SG	Clyde	WoS
Performance (%)	96.8%	86.4%	94.5%	93.1%	93.1%	89.6%	92.7%
Numerator	153	102	205	202	231	129	1022
Denominator	158	118	217	217	248	144	1102
NR numerator	0	0	0	0	0	0	0
NR exclusions	0	0	0	0	0	0	0
NR denominator	0	0	0	0	0	0	0

Of the 1102 patients with a pathological diagnosis of NSCLC, 1022 patients are recorded as having a tumour subtype identified resulting in a WoS performance of 92.7% against the 90% QPI target.

Five of the six units exceeded the 90% target, with performance ranging from 86.4% in NHS Forth Valley to 96.8% in NHS Ayrshire & Arran. NHS Forth Valley commented that all cases not meeting the QPI have been reviewed. All underwent immunohistochemistry but results were inconclusive.

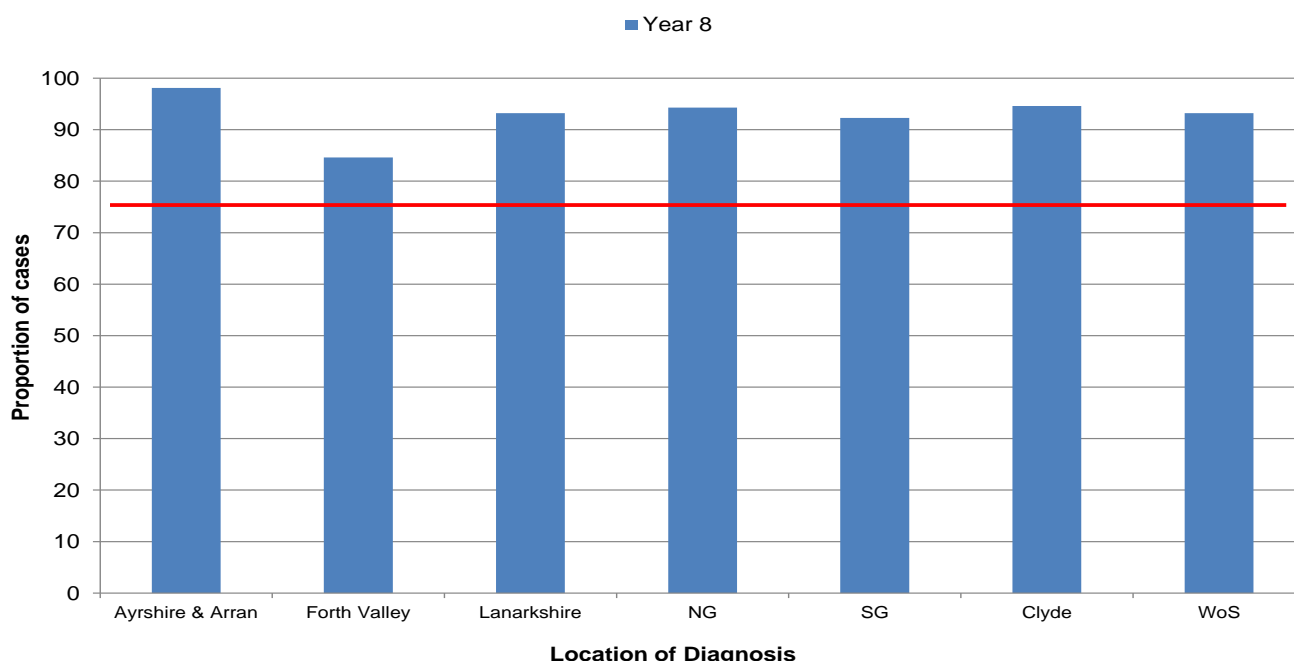
Specification 2(iii) previously looked at the number of patients with a pathological diagnosis of stage IIIB - IV non-squamous NSCLC who had molecular profiling undertaken. Following discussion at formal

review the clinical cohort was updated to include stage IIIA cases and also to include those who have broad oncogenic mutation profiling undertaken (includes EGFR, ALK, ROS-1). As this update required new fields to be added to the dataset results for this QPI will not be available until next year.

At formal review a fourth specification was added to QPI 2 to look at the number of patients with a pathological diagnosis of stage III - IV NSCLC who have PD-L1 testing undertaken.

Title:	(iv): Patients with a pathological diagnosis of stage III or IV NSCLC who have PDL-1 testing undertaken.
Numerator:	Number of patients with a pathological diagnosis of stage III or IV NSCLC who have PDL-1 testing undertaken.
Denominator:	All patients with a pathological diagnosis of stage III or IV NSCLC.
Exclusions:	Patients with performance status 4.
Target:	75% or above

Figure 8: The proportion of patients with a pathological diagnosis of stage III or IV NSCLC who have PDL-1 testing undertaken.



QPI 2(iv) Target: 75%	AA	FV	Lan	NG	SG	Clyde	WoS
Performance (%)	98.1%	84.6%	93.2%	94.3%	92.3%	94.6%	93.2%
Numerator	103	66	124	116	156	88	653
Denominator	105	78	133	123	169	93	701
NR numerator	0	0	0	0	2	0	2
NR exclusions	1	5	1	2	9	0	18
NR denominator	1	2	19	0	9	5	36

In the WoS, 93.2% of patients with a pathological diagnosis of stage III or IV NSCLC underwent PDL-1 testing achieving the 75% QPI target. All units met the QPI target.

QPI 6: Surgical resection in NSCLC

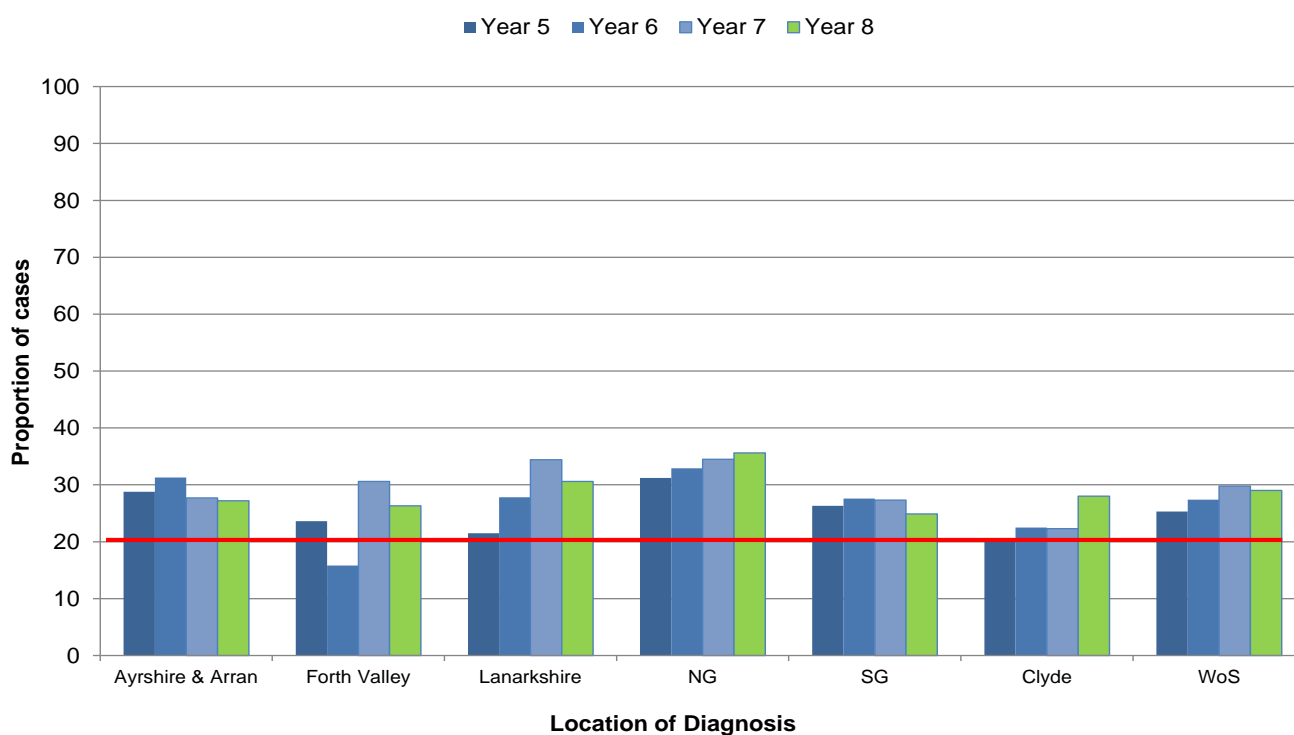
All patients should be considered for surgical treatment appropriate to their stage of disease. For patients with NSCLC who are suitable for treatment with curative intent surgical resection by lobectomy

is the superior treatment option. Surgery is the treatment which offers best chance of cure to patients with localised NSCLC¹.

Following formal review the following exclusion categories were removed from both QPI 6 specifications: Patients who refuse surgery and patients who undergo stereotactic ablative radiotherapy (SABR), The QPI tolerance been updated to include patient choice.

Title:	(i) Patients with non small cell lung cancer (NSCLC) should undergo surgical resection
Numerator:	Number of patients with NSCLC who undergo surgical resection.
Denominator:	All patients with NSCLC.
Exclusions:	Patients who die before surgery.
Target:	20% or above.

Figure 9: The proportion of patients with NSCLC who undergo surgical resection.



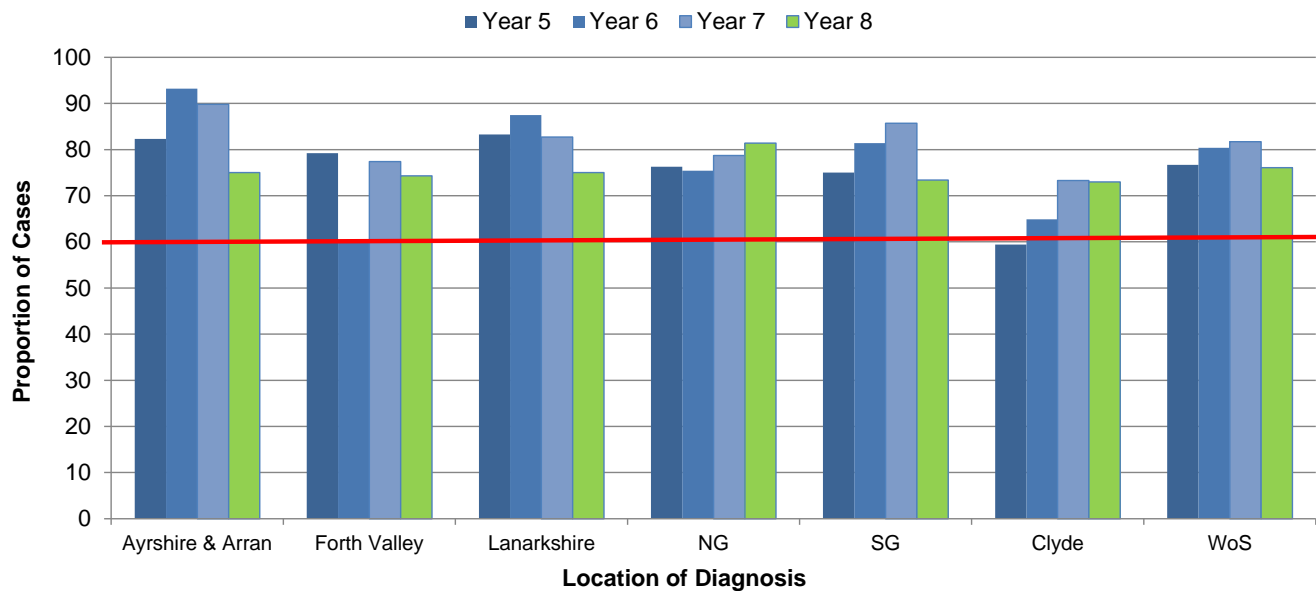
QPI 6(i) Target: 20%	AA	FV	Lan	NG	SG	Clyde	WoS
Performance (%)	27.2%	26.3%	30.6%	35.6%	24.9%	28.0%	29.0%
Numerator	43	31	66	77	61	40	318
Denominator	158	118	216	216	245	143	1096
NR exclusions	0	0	0	0	0	0	0
NR denominator	0	0	0	0	0	0	0

Performance across the WoS was 29% against the 20% target with 318 of 1096 patients with NSCLC undergoing surgical resection. All units achieved the target with performance ranging from 24.9% in South Glasgow to 35.6% in North Glasgow.

There was a decrease in the number of lung resections carried out in 2020 compared to 2019 (n=410). This is likely to be largely due to the impact of the COVID-19 pandemic and mostly reflects the lower number of referrals to surgical services.

Title:	(ii) Patients with stage I – II NSCLC who undergo surgical resection.
Numerator:	Number of patients with stage I-II (T1aN0 - T2bN1 or T3N0) NSCLC who undergo surgical resection.
Denominator:	All patients with stage I-II (T1aN0 - T2bN1 or T3N0) NSCLC.
Exclusions:	All patients who die before surgery.
Target:	60% or above

Figure 10: The proportion of patients with stage I-II NSCLC who undergo surgical resection.



QPI 6(ii) Target: 60%	AA	FV	Lan	NG	SG	Clyde	WoS
Performance (%)	75.0%	74.3%	75.0%	81.4%	73.4%	73.0%	76.1%
Numerator	36	26	42	70	47	27	248
Denominator	48	35	56	86	64	37	326
NR exclusions	0	0	0	0	0	0	0
NR denominator	0	2	18	0	9	5	34

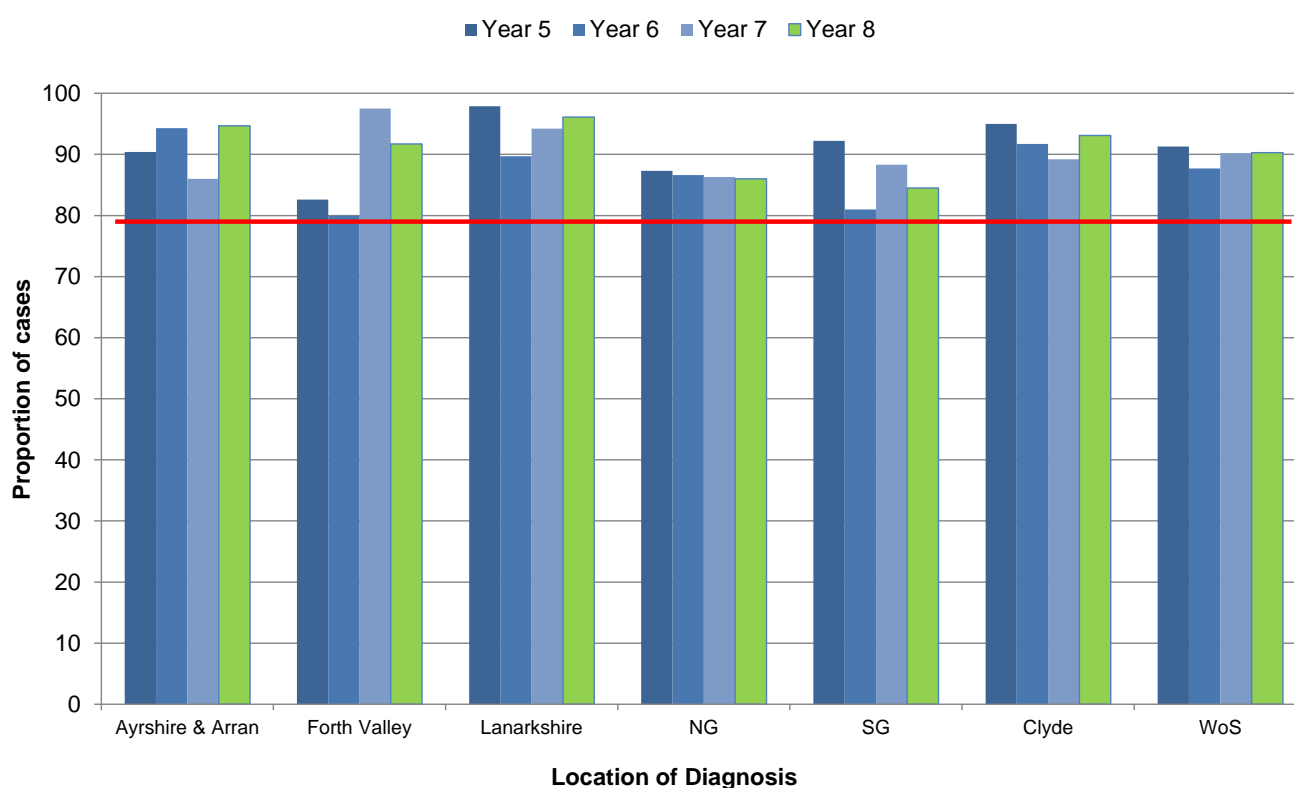
Overall in the WoS, 76.1% of patients with stage I-II NSCLC underwent surgical resection, successfully achieving the 60% target. All units achieved the QPI target with performance ranging from 73% in Clyde to 81.4% in North Glasgow. Performance over the previous years is noted as being consistently high as demonstrated in Figure 10.

QPI 7: Lymph node assessment

Adequate assessment of lymph nodes for accurate staging helps guide prognosis and further treatment management¹.

Title:	In patients with NSCLC undergoing surgery adequate assessment of lymph nodes should be made.
Numerator:	Number of patients with NSCLC undergoing surgical resection by lobectomy or pneumonectomy that have at least 1 node from at least 3 N2 stations sampled at time of resection or at previous mediastinoscopy.
Denominator:	All patients with NSCLC undergoing surgical resection by lobectomy or pneumonectomy.
Exclusions:	No exclusions.
Target:	80%

Figure 11: The proportion of patients with NSCLC undergoing surgical resection by lobectomy or pneumonectomy that have at least 1 node from at least 3 N2 stations sampled.



QPI 7 Target: 80%	AA	FV	Lan	NG	SG	Clyde	WoS
Performance (%)	94.7%	91.7%	96.1%	86.0%	84.5%	93.1%	90.3%
Numerator	36	22	49	49	49	27	232
Denominator	38	24	51	57	58	29	257
NR numerator	0	0	1	0	0	0	1
NR exclusions	0	0	0	0	0	0	0
NR denominator	0	0	0	0	0	0	0

Overall in the WoS of the 257 patients diagnosed with NSCLC undergoing surgical resection by lobectomy or pneumonectomy, 232 had at least 1 node from at least 3 N2 stations sampled at time of resection or at previous mediastinoscopy, which equates to 90.3%, achieving the 80% QPI target for

the fourth consecutive year. All units met the QPI target with unit results over the three years noted as being consistently high.

All lung cancer surgery in the WoS is centralised and performed at the Golden Jubilee National Hospital (GJNH), regardless of hospital or Board of diagnosis. Patients are also referred there for surgery from other Scottish Regional Cancer Networks. During 2020 a total of 296 patients with NSCLC underwent surgical resection by lobectomy or pneumonectomy in the GJNH. This is broken down across the Regional Cancer Networks as follows:

- 258 WoSCAN
- 28 North Cancer Alliance (NCA)
- 10 South East Scotland Cancer Network (SCAN)

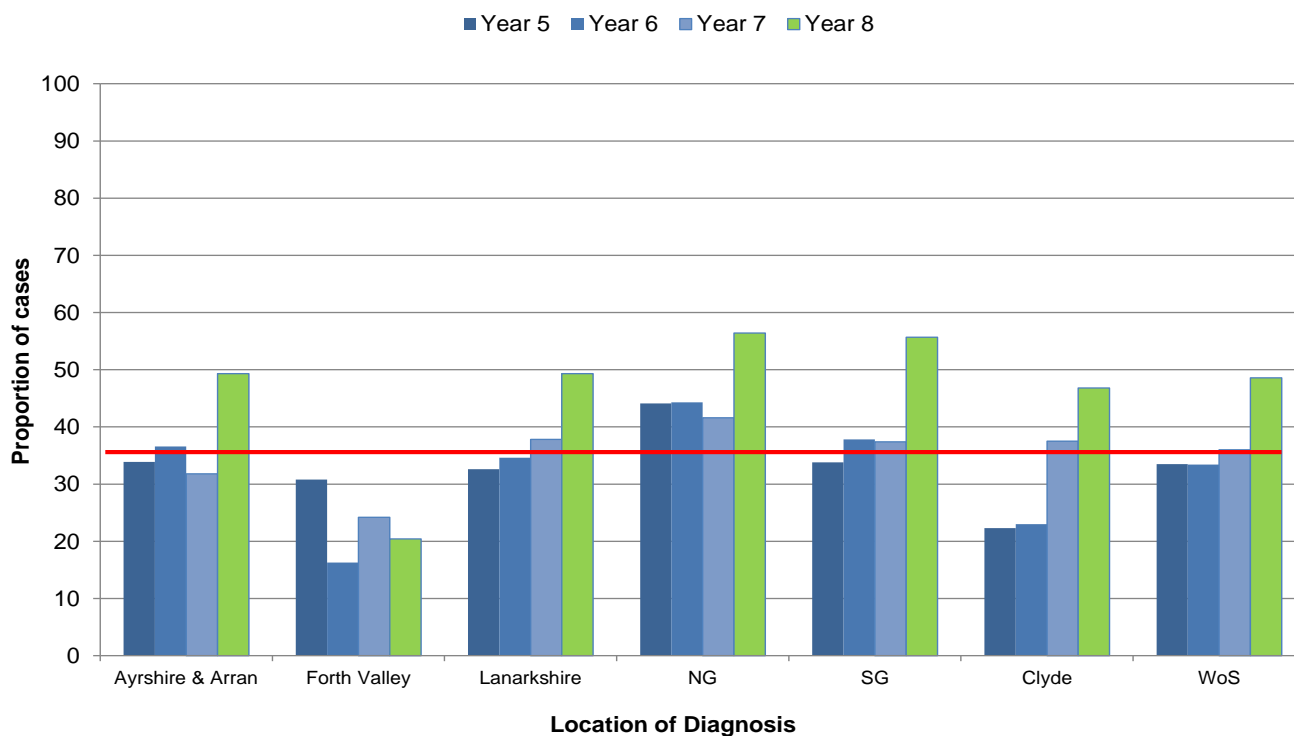
Of these, 90.2% (267 patients) had adequate sampling of lymph nodes as per the QPI.

QPI 8: Radiotherapy in inoperable lung cancer.

Radiotherapy is an important treatment option as it has a proven survival benefit for patients with lung cancer. The target for this QPI is set at 35% with the tolerance level designed to account for the fact that due to co-morbidities and age not all patients will be suitable for radiotherapy. In addition, patients may not have disease that can be encompassed within a radical radiotherapy field without excess toxicity¹.

Title:	Patients with inoperable lung cancer should receive radiotherapy ± chemotherapy, or SABR.
Numerator:	Number of patients with stage I-IIIa lung cancer not undergoing surgery who received radical radiotherapy (≥54Gy) ± chemotherapy, or SABR.
Denominator:	All patients with stage I-IIIa lung cancer not undergoing surgery
Exclusions:	Patients with SCLC Patients who refuse radiotherapy. Patients who die prior to treatment.
Target:	35%

Figure 12: The proportion of patients with stage I-IIIa lung cancer not undergoing surgery who received radical radiotherapy ± chemotherapy, or SABR.



QPI 8 Target: 35%	AA	FV	Lan	NG	SG	Clyde	WoS
Performance (%)	49.3%	20.4%	49.3%	56.4%	55.7%	46.8%	48.6%
Numerator	33	11	35	53	64	29	225
Denominator	67	54	71	94	115	62	463
NR numerator	0	0	0	0	0	0	0
NR exclusions	0	0	0	0	0	0	0
NR denominator	2	3	24	1	3	4	37

Following formal review the clinical cohort is now restricted to stage I - IIIa lung cancer patients who do not undergo surgery rather than all patients. The exclusion of Stage IV cases was also removed as this

was no longer required due to denominator updates. These updates may contribute to the improved performance noted across the majority of Boards.

Performance across the WoS was 48.6% against the 35% QPI target with 225 of 463 patients with inoperable lung cancer receiving radical radiotherapy ± chemotherapy or SABR. NHS Forth Valley were the only Board not to meet the target achieving 20.4%.

NHS FV has been an outlier with regards to this measure for the last two years. The Board has reviewed cases and concluded that patients were managed appropriately, however the Board has been asked to provide details of the local clinical review to enable the apparent variance in curative treatment rates to be explored further.

Further review of NHS FV data by the Lead Clinician indicated that that due to a local data recording error, many patients have been incorrectly included in the final results and as a consequence have skewed the data. Of the 54 patients included in the denominator criteria 13 were incorrectly included. Once data had been updated NHS FV achieved a final QPI result of 29.3 % (12/41) against the 35% target.

There is variation across the region in the proportion of patients with inoperable lung cancer receiving radiotherapy ± chemotherapy, or SABR, ranging from 29.3% in NHS FV to 56.4% in North Glasgow. The MCN will work with NHS FV to review /analyse MDT decision making regarding radical treatment and potential factors influencing this.

QPI 6 and QPI 8 data provide an indication of the proportion of lung cancer patients receiving any curative intent treatment (surgery or radical radiotherapy +/- chemotherapy), which apart from prevention is *the* major factor in improving survival. This radical treatment rate ranges from 16.2 % (FV) to 34.4% (NG) of all lung cancer patients and indicates significant unexplained variation across the region in the proportion of lung cancer patients receiving curative intent treatment.

Action:

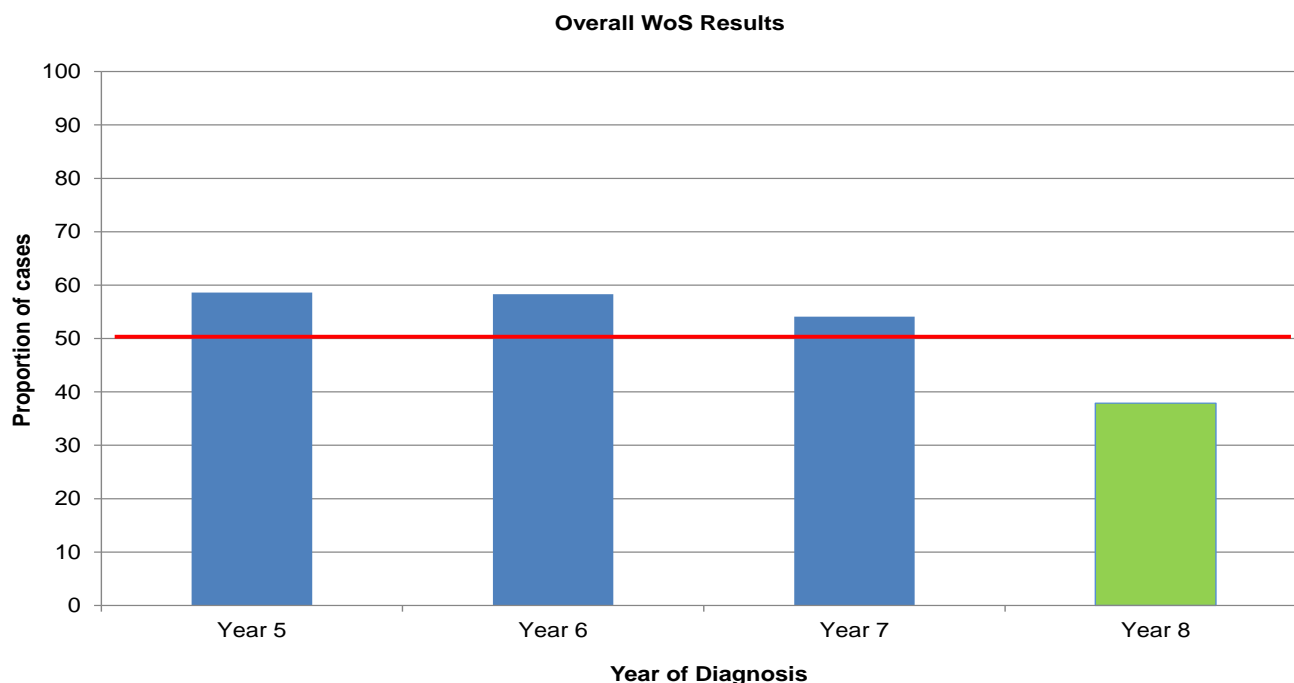
- The provision of all annual data in one report makes timely review by clinicians in advance of publication challenging and leaves no opportunity to monitor and improve performance during the running year. NHS FV to ensure quarterly reports are made available for review by clinicians.
- The MCN will work with NHS FV to review /analyse MDT decision making regarding radical treatment and potential factors influencing this, and determine if further action is possible to improve radical treatment rates.

QPI 9: Chemoradiotherapy in locally advanced NSCLC

Patients with stage III NSCLC who are not suitable for surgery should receive chemoradiotherapy, as this has a proven survival benefit. Potential benefit of survival does, however, have to be balanced with the risk of additional toxicities from this treatment¹.

Title:	Patients with locally advanced non small cell lung cancer (NSCLC) not undergoing surgery should receive potentially curative radiotherapy and concurrent or sequential chemotherapy
Numerator:	All patients with stage IIIa NSCLC with performance status 0-1 not undergoing surgery who receive chemoradiotherapy (radical radiotherapy ≥54Gy and concurrent or sequential chemotherapy).
Denominator:	All patients with stage IIIa NSCLC with performance status 0-1 not undergoing surgery who receive radical radiotherapy ≥54Gy.
Exclusions:	Patients who decline chemotherapy treatment. Patients who die prior to treatment. Patients receiving Continuous Hyperfractionated Radiotherapy.
Target:	50%

Figure 13: The proportion of patients with stage IIIa NSCLC with PS 0-1 not undergoing surgery who receive chemoradiotherapy.



QPI 9 Target: 50%	Year 5	Year 6	Year 7	Year 8
Performance (%)	58.6%	58.3%	54.1%	37.9%
Numerator	17	14	20	11
Denominator	29	24	37	29
NR numerator	0	0	0	0
NR exclusions	3	0	0	0
NR denominator	2	0	2	1

Following discussion at formal review the exclusion criteria was amended to 'patients that decline chemotherapy treatment' rather than decline treatment.

Due to the smaller numbers included within this QPI cumulative WoS results are presented in Figure 13.

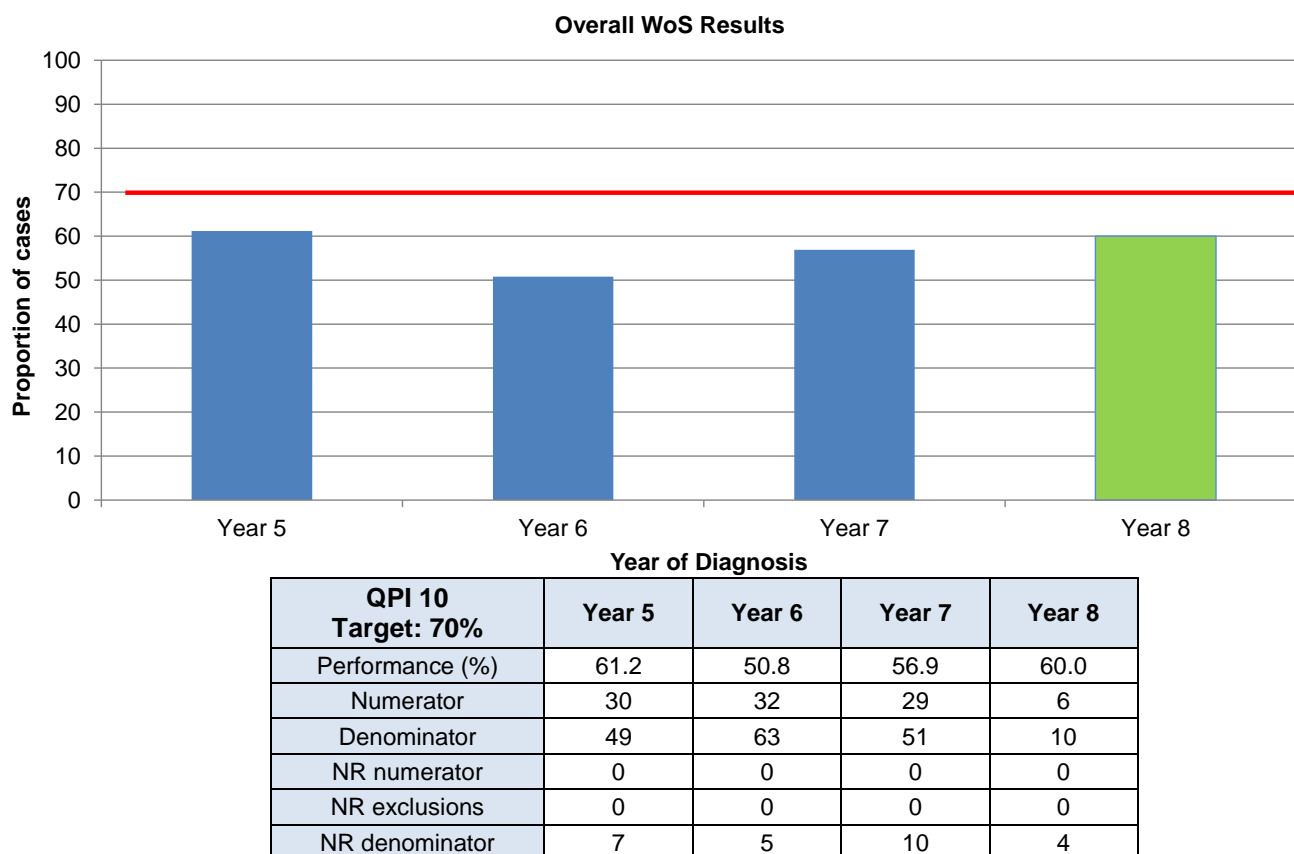
Overall in the WoS 37.9% of patients with stage IIIa NSCLC, PS 0-1 not undergoing surgery received chemoradiotherapy, which is below the 50% target. Boards reviewed cases not meeting the QPI and commented that all cases have been reviewed and treated appropriately.

QPI 10: Chemoradiotherapy in limited stage SCLC

Patients with limited stage disease Small Cell Lung Cancer (SCLC) should receive concurrent chemoradiotherapy, as this is proven to improve survival. Combination treatment is dependent on patient fitness levels and any potential survival benefit should be balanced with the risk of additional toxicities of this treatment¹.

Title:	Patients with limited stage SCLC should receive platinum based chemotherapy and (concurrent or sequential) radiotherapy.
Numerator:	All patients with stage I-IIIb SCLC with PS 0-1 who receive chemoradiotherapy
Denominator:	All patients with stage I-IIIb SCLC with PS 0-1.
Exclusions:	Patients who refuse treatment. Patients who die prior to treatment. Patients who undergo surgical resection.
Target:	70%

Figure 14: The proportion of patients with limited stage SCLC receiving platinum based chemotherapy and radiotherapy.



Following formal review the clinical cohort was revised from stage I - IIIB to stage I – IIIA.

Small numbers are a factor within this QPI therefore cumulative WoS results are presented. Overall in the WoS 60% (6 out of 10) of patients with stage I-IIIa SCLC with PS 0-1 received chemoradiotherapy.

NHS Forth Valley commented that it should be noted small numbers have a large impact on this QPI. The patients which did not meet the QPI criteria have been clinically reviewed and it was shown all patients were treated appropriately with palliative chemotherapy.

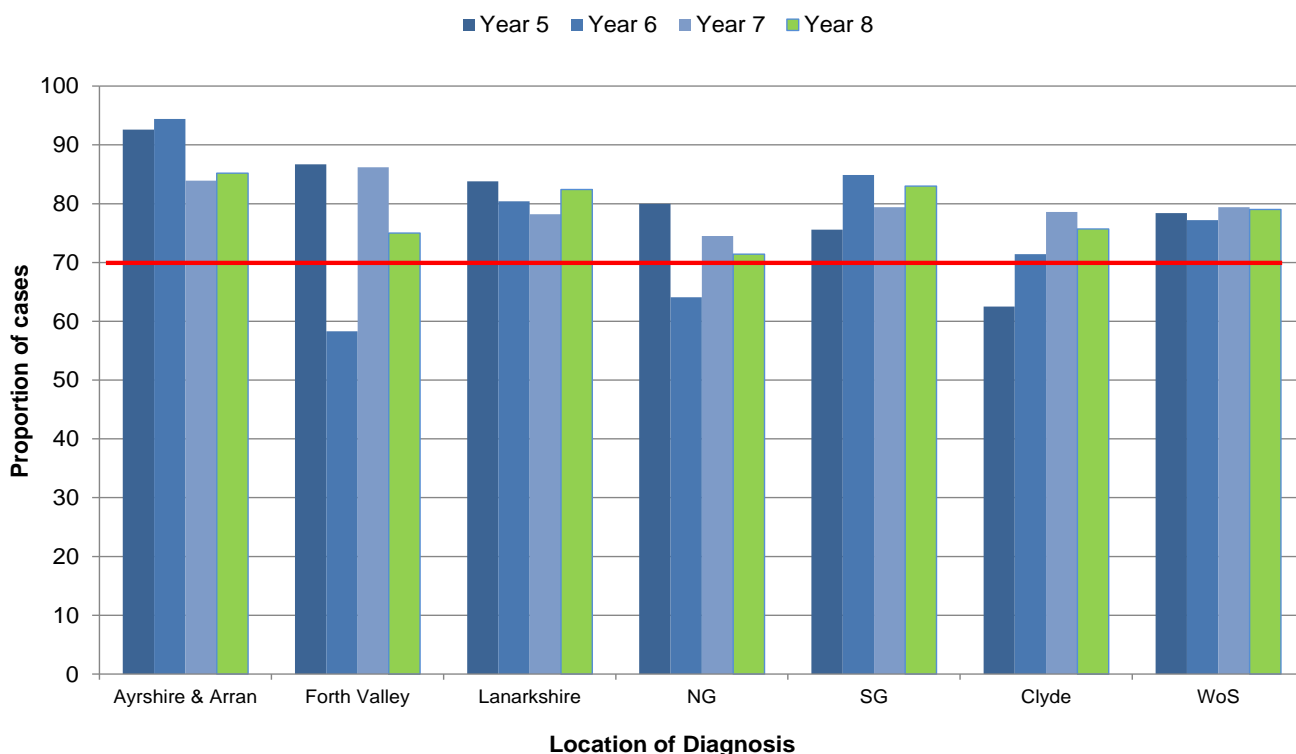
South Glasgow reported that all patients were reviewed and were contraindicated due to co-morbidity.

QPI 12: Chemotherapy in SCLC

Patients with SCLC should receive combination chemotherapy, dependent on fitness levels, as this has a proven survival benefit and provides palliation for symptoms caused by primary or metastatic tumour¹.

Title:	(i) Patients SCLC should receive chemotherapy.
Numerator:	All patients with SCLC who receive first line chemotherapy ± radiotherapy.
Denominator:	All patients with SCLC.
Exclusions:	Patients who refuse chemotherapy. Patients who die prior to treatment. Patients who are participating in clinical trials.
Target:	70%

Figure 15: The proportion of patients with SCLC who receive first line chemotherapy ± radiotherapy.

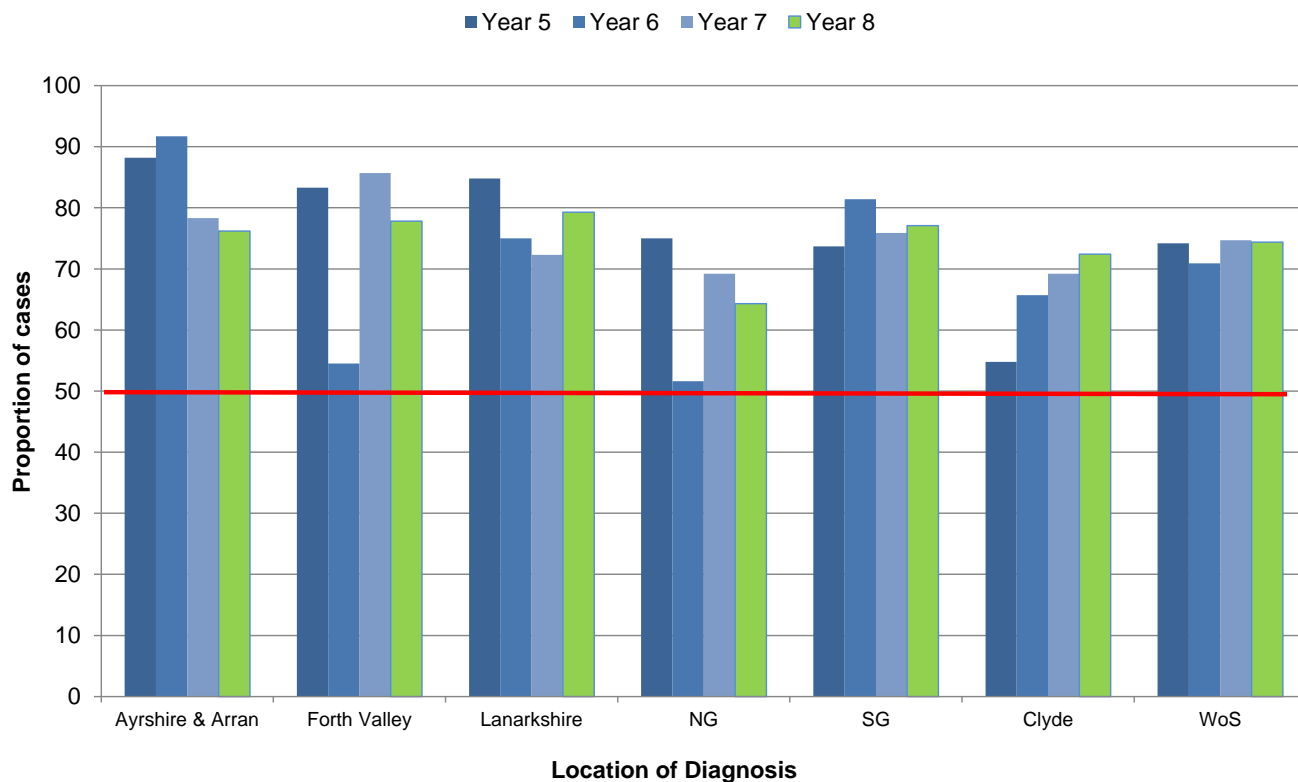


QPI 12(i) Target: 70%	AA	FV	Lan	NG	SG	Clyde	WoS
Performance (%)	85.2%	75.0%	82.4%	71.4%	83.0%	75.7%	79.0%
Numerator	23	15	28	25	39	28	158
Denominator	27	20	34	35	47	37	200
NR numerator	0	0	0	0	0	0	0
NR exclusions	0	0	0	0	1	0	1
NR denominator	0	0	0	0	0	0	0

Overall 158 of the 200 patients diagnosed with SCLC in the WoS received chemotherapy ± radiotherapy, resulting in a performance of 79% against the 70% QPI target. All units achieved the QPI.

Title:	(ii) Patients SCLC should receive chemotherapy.
Numerator:	All 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 refuse chemotherapy. Patients who die prior to treatment. Patients who are participating in clinical trials.
Target:	50%

Figure 16: The proportion of patients with SCLC not undergoing treatment with curative intent who receive palliative chemotherapy.



QPI 12(ii) Target: 50%	AA	FV	Lan	NG	SG	Clyde	WoS
Performance (%)	76.2%	77.8%	79.3%	64.3%	77.1%	72.4%	74.4%
Numerator	16	14	23	18	27	21	119
Denominator	21	18	29	28	35	29	160
NR numerator	0	0	0	0	0	0	0
NR exclusions	0	0	0	0	1	0	1
NR denominator	0	0	0	0	0	0	0

Of the 160 SCLC patients not undergoing treatment with curative intent in the WoS, 119 received palliative chemotherapy. This equates to 74.4% and successfully achieves the 50% QPI target. As demonstrated in Figure 16 all units met the target with results over the four years noted as being consistently high.

QPI 13: 30/90 Day Mortality: 30/90 day mortality following treatment for lung cancer

Thirty-day mortality following treatment for lung cancer for all patients diagnosed in WoS is shown in Table 3 against the evidence-based targets of less than 5%.

With regards to mortality following SACT, a decision has been taken nationally to move to a new generic QPI (30-day mortality for SACT) applicable across all tumour types. This new QPI will use CEPAS (Chemotherapy ePrescribing and Administration System) data to measure SACT mortality to ensure that the QPI focuses on the prevalent population rather than the incident population. The measurability for this QPI is still under development to ensure consistency across the country and it is anticipated that performance against this measure will be reported in the next audit cycle. In the meantime all deaths within 30 days of SACT will continue to be reviewed at a NHS Board level.

Title:	30 day Mortality following treatment for lung cancer.
Numerator:	All patients with lung cancer who receive active treatment who die within 30 days of treatment.
Denominator:	All patients with lung cancer who receive active treatment.
Exclusions:	No exclusions.
Target:	<5% (or <10% for palliative chemotherapy and biological therapy)

Table 3: The proportion of patients with lung cancer who receive active treatment who die within 30 days of treatment.

	QPI Target	WoS Result (Year 5)	WoS Result (Year 6)	WoS Result (Year 7)	WoS Result (Year 8)
Surgery	<5 %	0.8% (3/366)	0.5% (2/367)	1.1% (5/452)	0.9% (3/332)
Radical Radiotherapy	<5 %	1.2% (3/246)	1.7% (4/229)	1.2% (3/257)	1.6% (4/256)

The target was achieved at board and regional level for both surgery and radical radiotherapy.

With regards to surgery, the 30 day mortality rate for all patients receiving surgery at the GJNH, regardless of region of diagnosis, was 0.8% (3/357 patients).

Title:	90 day Mortality following treatment for lung cancer.
Numerator:	All patients with lung cancer who receive active treatment who die within 90 days of treatment.
Denominator:	All patients with lung cancer who receive active treatment.
Exclusions:	No exclusions.
Target:	<5%

Table 4: The proportion of patients with lung cancer who receive active treatment who die within 90 days of treatment.

	QPI Target	WoS Result (Year 5)	WoS Result (Year 6)	WoS Result (Year 7)	WoS Result (Year 8)
Surgery	<5 %	2.0% (7/358)	1.4% (5/360)	1.8% (8/451)	1.5% (5/331)
Radical Radiotherapy	<5 %	5.9% (14/236)	5.8% (13/223)	6.3% (16/255)	4.9% (12/247)

The target was achieved at board and regional level for both surgery and radical radiotherapy.

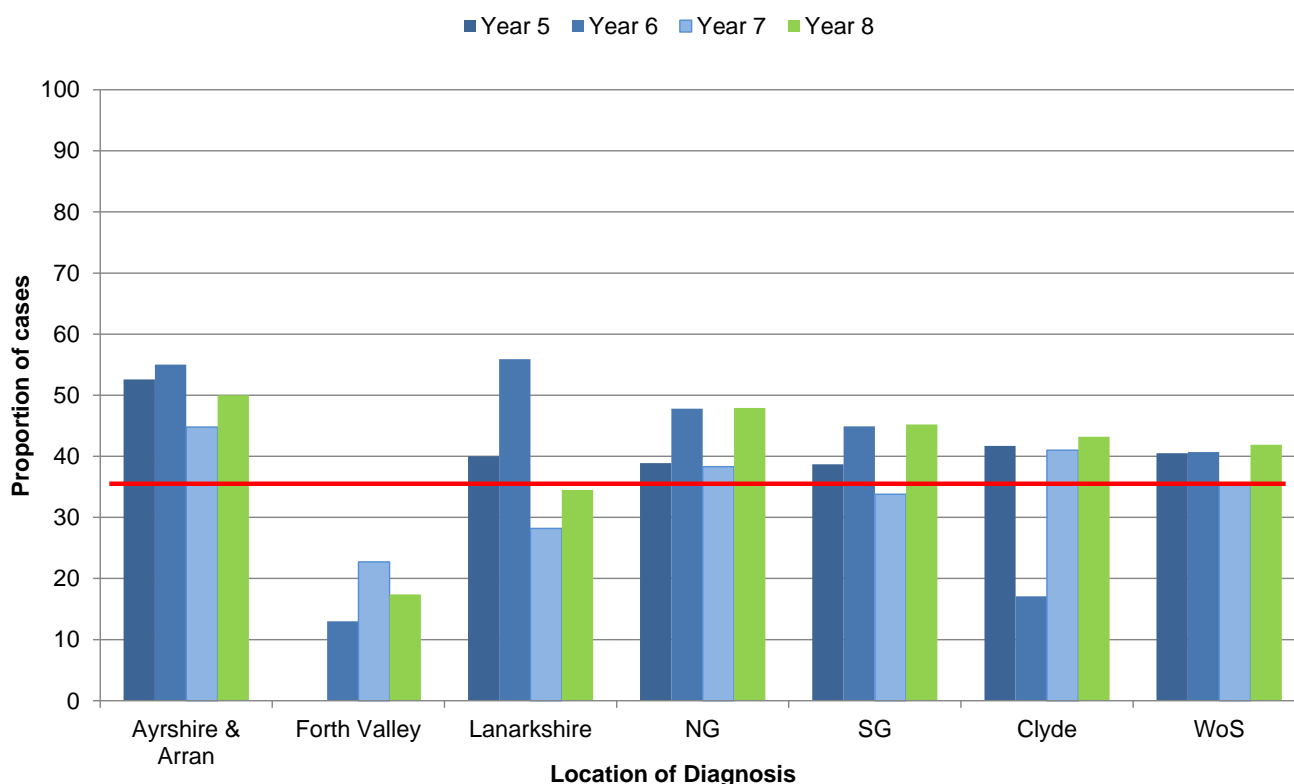
With regards to surgery, the 90 day mortality rate for all patients receiving surgery at the GJNH, regardless of region of diagnosis, was 1.7% (6/356 patients).

QPI 14: Stereotactic Ablative Radiotherapy (SABR) in inoperable stage I lung cancer.

SABR is now a recognised treatment option for patients with medically inoperable early stage lung cancer. Patients with stage I lung cancer who are not suitable for surgery should receive SABR as this has a proven survival benefit¹.

Title:	Patients with inoperable stage I lung cancer should receive SABR.
Numerator:	Number of patients with stage I 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 refuse SABR, Patients who die prior to treatment.
Target:	35%

Figure 17: The proportion of patients with stage I lung cancer not undergoing surgery who receive SABR.



QPI 14 Target: 35%	AA	FV	Lan	NG	SG	Clyde	WoS
Performance (%)	50.0%	17.4%	34.5%	47.9%	45.2%	43.2%	41.9%
Numerator	14	4	10	23	28	16	95
Denominator	28	23	29	48	62	37	227
NR numerator	0	0	0	0	0	0	0
NR exclusions	0	0	0	0	0	0	0
NR denominator	0	1	17	2	10	3	33

Of the 227 patients with stage I lung cancer not undergoing surgery, 95 received SABR which equates to 41.9% and successfully meets the QPI target.

NHS Forth Valley achieved 17.4% against the 35% target. The Board commented all patients which breach this QPI have been clinically reviewed and the Board concluded that these patients were treated clinically appropriately.

NHS Lanarkshire were just marginally under the target. The Board commented that improvement was noted from the previous year's result of 28%. All cases have been reviewed and patients not meeting the QPI were treated appropriately. The Board added that compliance will continue to be monitored through local reports.

It should be noted that NHS FV have the lowest SABR rates across the region, however decisions relating to radiotherapy are made by oncologists at BWoSCC. The MCN is keen to explore this apparent variance in more detail.

Action:

- Lung team in BWoSCC to review the disparity around the administration of radiotherapy across the region.

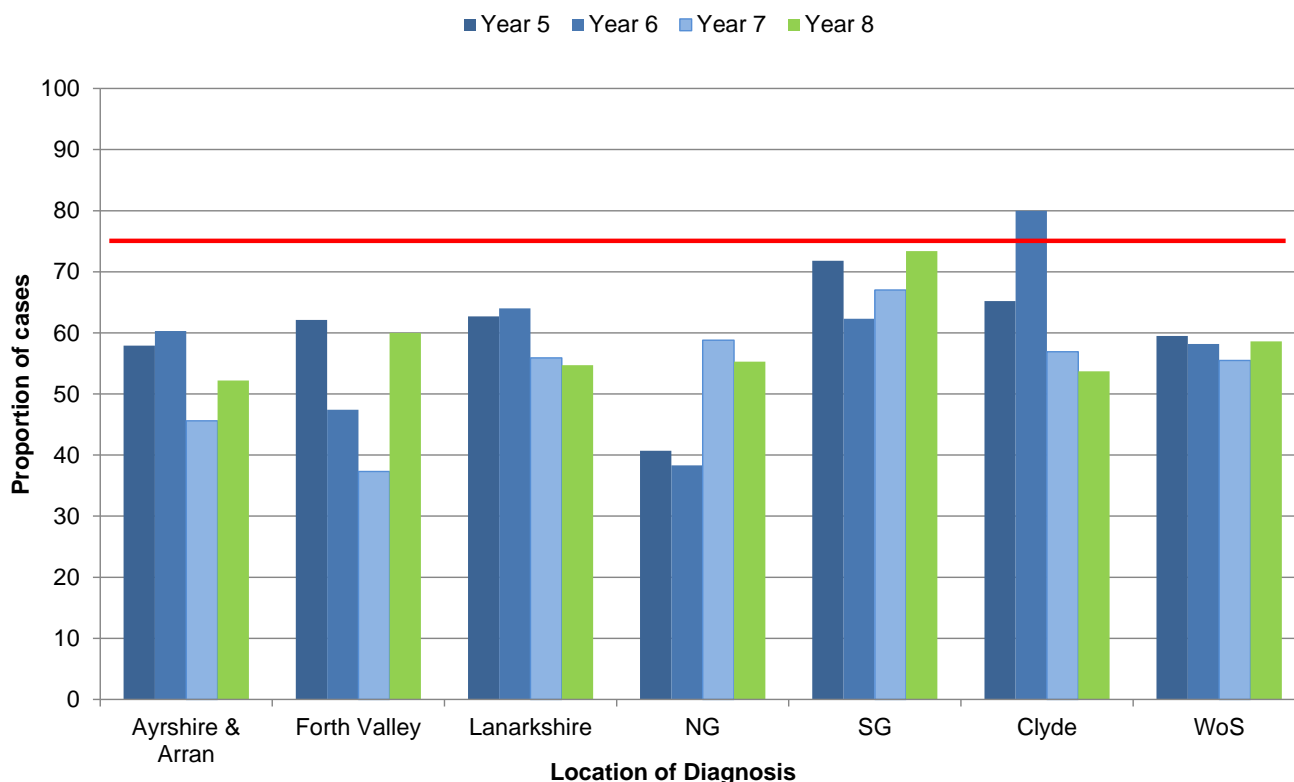
QPI 15: Pre Treatment Diagnosis.

A definitive diagnosis is valuable in helping inform patients and carers about the nature of the disease, the likely prognosis and treatment choice¹.

Following discussion at formal review the QPI was updated from 'first treatment' to 'definitive treatment' to ensure cytological / histological diagnosis prior to the correct treatment option. Frozen section is also now included within the definition of pre-operative histology.

Title:	Where possible patients should have a cytological/histological diagnosis prior to definitive treatment.
Numerator:	Number of patients who received curative treatment that have a cytological/histological diagnosis prior to starting definitive treatment. (surgery, radiotherapy, chemoradiotherapy)
Denominator:	All patients with lung cancer who receive curative treatment.
Exclusions:	Patients who refuse investigation.
Target:	75%

Figure 18: The proportion of patients who received curative treatment that have a cytological /histological diagnosis prior to surgery.



QPI 15(i) Target: 75%	AA	FV	Lan	NG	SG	Clyde	WoS
Performance (%)	52.2%	60.0%	54.7%	55.3%	73.4%	53.7%	58.6%
Numerator	24	21	35	42	47	22	191
Denominator	46	35	64	76	64	41	326
NR numerator	0	0	0	0	0	0	0
NR exclusions	0	0	0	0	0	0	0
NR denominator	0	0	0	0	0	0	0

No Board achieved the 75% target for QPI 15(i). The overall compliance with this target was 58.6%. Variation is evident across the region, which is in part due to the varying levels of input from

interventional radiology. In addition, the use of frozen section is often limited by the availability of pathology resource. Unless there are compelling patient related reasons for not carrying out CT guided biopsy then this should be done routinely prior to radical treatment.

South Glasgow came closest to achieving the target with a compliance of 73.4% (an increase from 67.0% in 2019). NHS Forth Valley demonstrated significant improvement in its results for this QPI with a rate of 60.0% (an increase from 37.5% in 2019). NHS Ayrshire & Arran also noted improvement compared to the previous year (52.2% in 2020 compared to 45.6% in 2019).

NHS Ayrshire & Arran commented that the patients without pathology are those with a negative/suspicious biopsy but who went straight to surgery and some patients who had a frozen section prior to resection. The Board added that pathology will always be attempted where possible/practical.

NHS Forth Valley reported that all patients who breached the target were reviewed and the Board concluded that they were managed clinically appropriately.

NHS Lanarkshire commented that all cases not meeting the QPI were reviewed and no benign pathology was resected. In most cases biopsies were attempted or were felt to be too difficult/risky to obtain pre-treatment diagnosis.

The North Glasgow sector reviewed all cases and reasons provided included; cases that were attempted but negative pathology, cases attempted but abandoned due to complications, cases contraindicated due to clinical risk, cases that were technically not possible due to size/position, one patient had separate primary confirmed at surgery, and two due to the COVID pandemic.

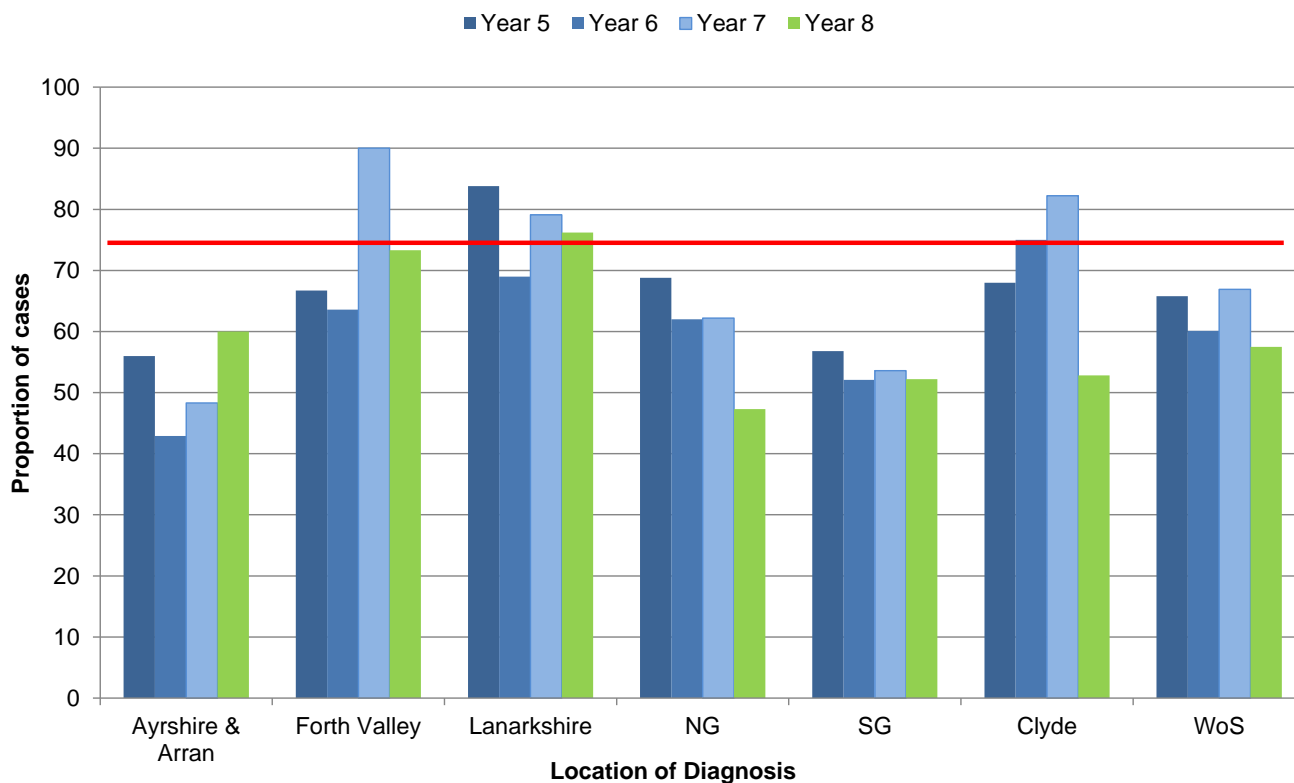
The South Glasgow sector commented that reasons for cases not meeting the QPI include diagnosis attempted but negative pathology, diagnosed on frozen section, contraindicated due to co-morbidity, technically not possible due to size/position or high clinical risk or that a histological/cytological diagnosis would not have altered patient management.

The Clyde sector reviewed all cases and reported valid clinical reasons including cases that were attempted but non diagnostic, cases not amenable to biopsy (high risk, location, small size) or contraindicated.

Action:

- MCN to consider the requirement for a formalised pathway for interventional radiology as part of the ongoing work to explore the possibility of a single diagnostic centre for the region.

Figure 19: The proportion of patients who received curative treatment that have a cytological /histological diagnosis prior to starting radical radiotherapy.



QPI 15(ii) Target: 75%	AA	FV	Lan	NG	SG	Clyde	WoS
Performance (%)	60.0%	73.3%	76.2%	47.3%	52.2%	52.8%	57.5%
Numerator	21	11	32	26	36	19	145
Denominator	35	15	42	55	69	36	252
NR numerator	0	0	1	0	0	0	1
NR exclusions	0	0	0	0	0	0	0
NR denominator	0	0	0	0	0	0	0

The overall WoS result for QPI 15 (ii) was 57.5%, which was below the 75% target and down on the 2019 figure of 66.9%. NHS Lanarkshire was the only board to achieve the target with a result of 76.2%. NHS Forth Valley was just under target achieving 73.3%. It should be noted that all Boards with the exception of NHS Ayrshire & Arran, experienced a decrease in performance in Year 8 compared to the previous year. The biggest reduction in performance was observed in North Glasgow (47.3% compliance with QPI in 2020 compared to 62.2% in 2019) and in Clyde (52.8% compliance in 2020 compared to 82.2% in 2019).

It is acknowledged that the variation across the region in the QPI performance is due to a variety of factors including: differences in practice in relation to performing CT guided biopsies for peripheral lesions and an increase in the proportion of patients receiving curative treatments despite being medically unwell.

Feedback from Boards not meeting the QPI reflects the comments made previously for QPI 15 (i).

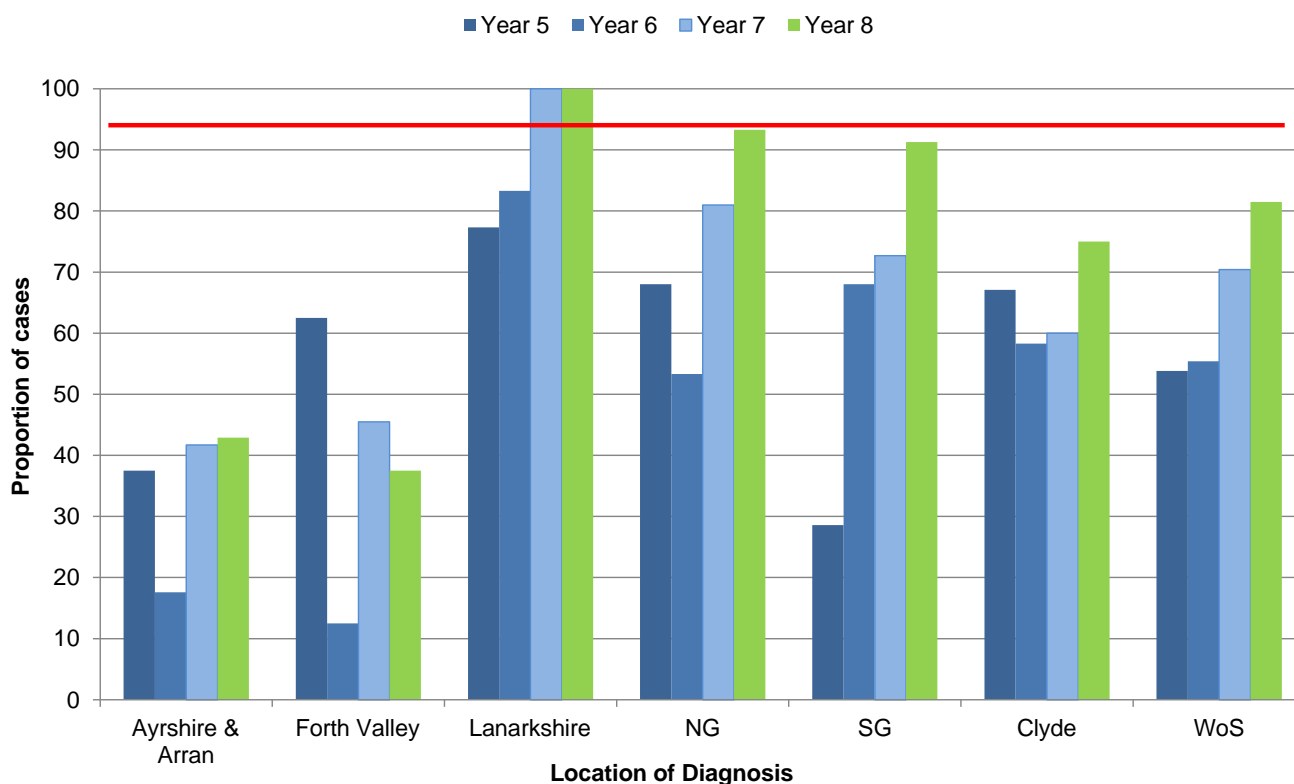
QPI 16: Brain Imaging.

Brain metastases are an important prognostic factor in lung cancer patients and the detection of these can influence decisions on appropriate treatment¹.

Following formal review the QPI was updated from 'first treatment' to 'definitive treatment' to ensure CT / MRI prior to the correct treatment option. Patients with SCLC were also added to the exclusion category.

Title:	Patients with N2 disease who are undergoing curative treatment should have brain imaging performed prior to commencing definitive treatment.
Numerator:	Number of patients with N2 disease who receive curative treatment that undergo contrast enhanced CT or contrast enhanced MRI prior to start of definitive treatment.
Denominator:	All patients with N2 disease who receive curative treatment.
Exclusions:	Patients who decline brain imaging, patients with small cell lung cancer (SCLC).
Target:	95%

Figure 20: The proportion of patients with N2 disease who receive curative treatment that undergo contrast enhanced CT or contrast enhanced MRI prior to start of treatment.



QPI 16 Target: 95%	AA	FV	Lan	NG	SG	Clyde	WoS
Performance (%)	42.9%	37.5%	100%	93.3%	91.3%	75.0%	81.5%
Numerator	3	3	16	14	21	9	66
Denominator	7	8	16	15	23	12	81
NR numerator	0	0	0	0	0	0	0
NR exclusions	0	0	0	0	0	0	0
NR denominator	0	0	17	1	5	2	25

Overall, 66 of the 81 patients diagnosed with N2 disease who received curative treatment in WoS underwent contrast enhanced CT or contrast enhanced MRI prior to the start of definitive treatment,

resulting in a performance of 81.5% against the 95% QPI target. Individual unit performance ranged from 37.5% in NHS Forth Valley to 100% in NHS Lanarkshire. Improvement is noted in Year 8, particularly across NHSGGC. This improvement is as a result of the new MDT form which includes automatic reminders which prompts clinicians to request brain imaging for patients, and the rapid diagnostic pathway implemented across NHSGGC.

It was noted that NHS Ayrshire & Arran and NHS Forth Valley results were significantly below the results of the other health boards (42.9% and 37.8% respectively). NHS Ayrshire & Arran have agreed to remind MDT members that patients should receive brain imaging prior to commencing treatment. NHS Forth Valley will review their MDT process to help to ensure brain imaging is recorded appropriately.

Action:

- NHS AA and FV to adopt the revised MDT form with 'pop up' prompt regarding brain imaging.

QPI 17: Clinical Trials Access

Clinical trials are necessary to demonstrate the efficacy of new therapies and other interventions. Evidence suggests improved patient outcomes from participation in clinical trials¹. Clinicians are therefore encouraged to enter patients into well-designed trials and to collect longer-term follow-up data. High accrual activity into clinical trials is used as a goal of an exemplary clinical research site¹.

The clinical trials QPI is measured utilising Scottish Cancer Research Network (SCRN) data and PHS incidence data, as this is the methodology currently utilised by the Chief Scientist Office (CSO) and the National Cancer Research Institute (NCRI). The principal benefit of this approach is that this data is already collected utilising a robust mechanism¹. The QPI looks at *all* patients with lung cancer consented into a trial in the calendar year 1st January to 31st December 2020, and not just those patients who had an initial diagnosis in that same period.

Title:	All patients should be considered for participation in available clinical trials/research studies, wherever eligible.
Numerator:	Number of patients with lung cancer who are consented* for a clinical trial / research study.
Denominator:	All patients with lung cancer.
Exclusions:	No exclusions
Target:	15%

Table 5: Proportion of patients diagnosed lung cancer who are consented* for a clinical trial / research study in 2020.

NHS Board of Residence	Consented - QPI Target 15%			Recruited		
	N	D	%	N	D	%
Ayrshire & Arran	0	359	0.0%	0	359	0.0%
Forth Valley	0	289	0.0%	0	289	0.0%
GGC	7	1505	0.5%	7	1505	0.5%
Lanarkshire	1	588	0.2%	1	588	0.2%
WoS	8	2741	0.3%	8	2741	0.3%

Performance against this QPI was affected by the COVID-19 pandemic in 2020. Trial recruitment was suspended due to the COVID-19 pandemic and all trial activity was stopped in March 2020.

5. Next Steps

The MCN will actively take forward regional actions identified and NHS Boards are asked to develop local Action/Improvement Plans in response to the findings presented in the report. A summary of actions for each NHS Board has been included within the Action Plan templates in Appendix III.

Acknowledgement

This report has been prepared using clinical audit data provided by the following NHS Boards in the WoSCAN area:

NHS Ayrshire & Arran
NHS Forth Valley
NHS Greater Glasgow and Clyde
NHS Lanarkshire

We would like to thank all members and active participants in the cancer network for their continued support of the MCN, and the many hospitals that are committed to making the audit succeed. We also acknowledge the efforts of the clinical effectiveness staff, nurses, and other service users for their work in ensuring the data are available to enable analysis to take place each year. Without their considerable efforts this level of progress would not be possible.

Abbreviations

CT	Computed Tomography
eCASE	Electronic Cancer Audit Support Environment
EGFR	Epidermal Growth Factor Receptor
GJNH	Golden Jubilee National Hospital
HIS	Healthcare Improvement Scotland
ISD	Information Services Division
MCN	Managed Clinical Network
MDT	Multidisciplinary Team
NCQSG	National Cancer Quality Steering Group
NCA	North Cancer Alliance
NSCLC	Non Small Cell Lung Cancer
PS	Performance Status
PET	Positron Emission Tomography
QPIs	Quality Performance Indicators
RCAG	Regional Cancer Advisory Group
SABR	Stereotactic Ablative Radiotherapy
SCAN	South East Scotland Cancer Network
SCLC	Small Cell Lung Cancer
WoS	West of Scotland
WoSCAN	West of Scotland Cancer Network

List of references and useful websites for further information

1. Lung Cancer. Clinical Quality Performance Indicators. Available at:
http://www.healthcareimprovementscotland.org/our_work/cancer_care_improvement/cancer_qpis/quality_performance_indicators.aspx [Accessed on: 10th March 2022]
2. Public Health Scotland. Cancer in Scotland. July 2020 Available at:
<https://www.isdscotland.org/Health-Topics/Cancer/Cancer-Statistics> [Accessed on: 10th March 2022]
3. Public Health Scotland. Summary Statistics for Lung Cancer. Available at:
<https://beta.isdscotland.org/find-publications-and-data/conditions-and-diseases/cancer/cancer-incidence-in-scotland/> [Accessed on: 10th March 2022]

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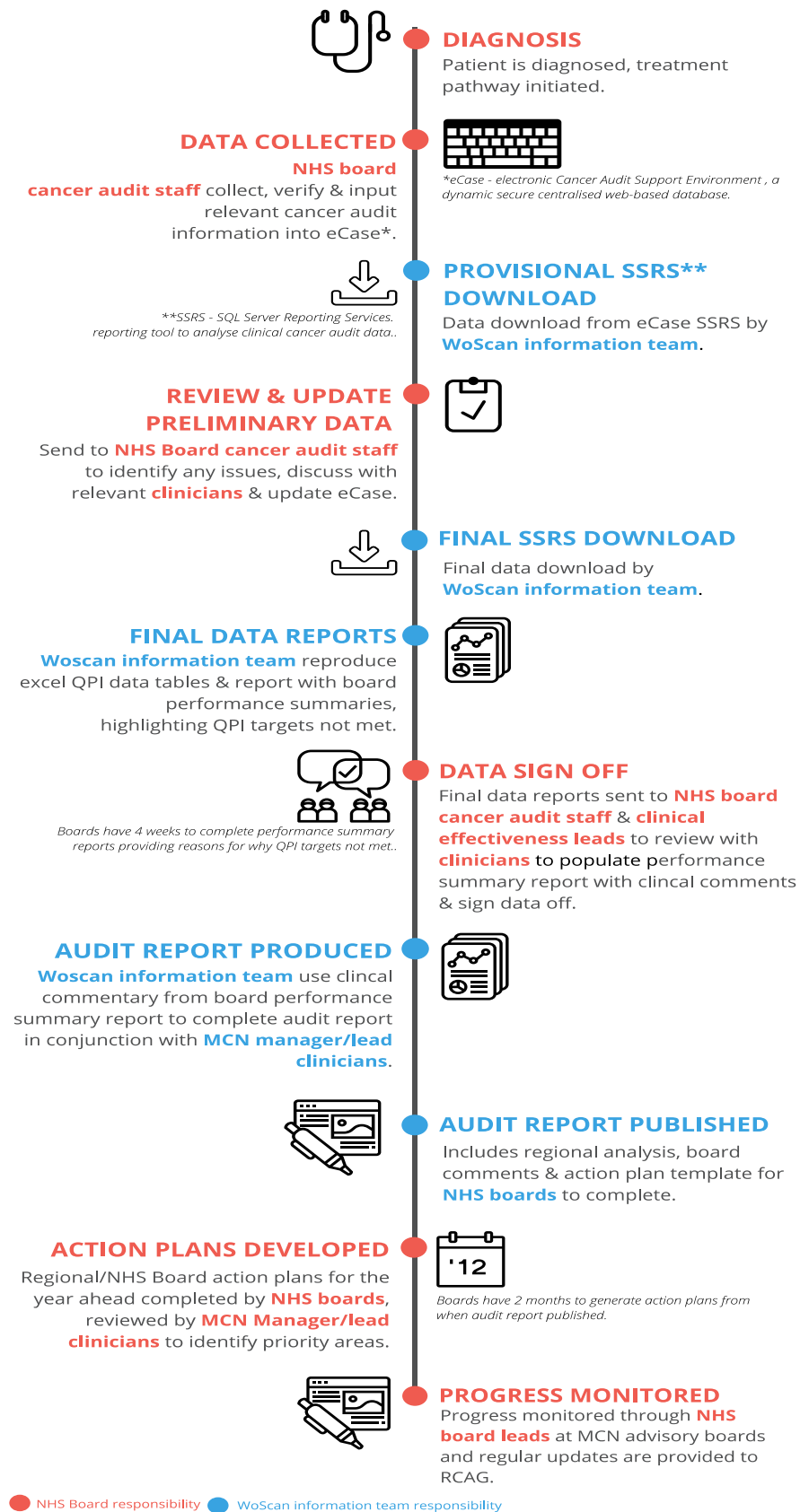
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Appendix 1: Meta Data

Report Title	Cancer Audit Report: Lung Cancer Quality Performance Indicators																								
Time Period	Patients diagnosed between 01 January 2020 and 31 December 2020																								
Data Source	Cancer Audit Support Environment (eCASE). A secure centralised web-based database which holds cancer audit information in Scotland.																								
Data extraction date	2200 hrs on 15 September 2021																								
Methodology	<p>Analysis was performed centrally for the region by the WoSCAN Information Team. The timescales agreed took into account the patient pathway to ensure that a complete treatment record was available for the majority of patients.</p> <p>Initial results were provided to Boards to check for inaccuracies, inconsistencies or obvious gaps and a subsequent download taken upon which final analysis was carried out.</p> <p>The final data analysis was disseminated for NHS Board verification in line with the regional audit governance process to ensure that the data was an accurate representation of service in each area. Please see info graphic in appendix 2 for a more detailed look at the reporting process.</p>																								
Data Quality	<p>Audit data completeness can be assessed by estimating the proportion of expected patients that have been identified through audit compared to the number reported by the National Cancer registry (provided by PHS); this is known as case ascertainment. Figures should only be used as a guide as it is not possible to compare the same exact cohort from each data source. Note that a 5 year average is taken for cancer registry cases to take account of annual fluctuations in incidence within NHS Boards.</p> <p>Lung Cancer</p> <table border="1"> <thead> <tr> <th>Health Board of diagnosis</th> <th>(01/01/2020-31/12/2020) Audit</th> <th>Cancer Reg 2015-19*</th> <th>Case Ascertainment</th> </tr> </thead> <tbody> <tr> <td>Ayrshire & Arran</td> <td>328</td> <td>395</td> <td>83.0%</td> </tr> <tr> <td>GGC</td> <td>1180</td> <td>1505</td> <td>78.4%</td> </tr> <tr> <td>Forth Valley</td> <td>259</td> <td>289</td> <td>89.6%</td> </tr> <tr> <td>Lanarkshire</td> <td>417</td> <td>588</td> <td>70.9%</td> </tr> <tr> <td>WoS Total</td> <td>2184</td> <td>2777</td> <td>78.6%</td> </tr> </tbody> </table>	Health Board of diagnosis	(01/01/2020-31/12/2020) Audit	Cancer Reg 2015-19*	Case Ascertainment	Ayrshire & Arran	328	395	83.0%	GGC	1180	1505	78.4%	Forth Valley	259	289	89.6%	Lanarkshire	417	588	70.9%	WoS Total	2184	2777	78.6%
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Appendix 2: Cancer Audit Timeline



Appendix 3: Action / Improvement Plan – Lung Cancer

NHS Ayrshire & Arran

NHS Board:	NHS Ayrshire & Arran
Action Plan Lead:	
Date:	

KEY (Status)	
1	Action fully implemented
2	Action agreed but not yet implemented
3	No action taken (please state reason)

No	Action Required	NHS Board Action Taken	Timescales		Lead	Status (see key)
			Start	End		
	<i>Ensure actions mirror those detailed in Audit Report.</i>	Provide detailed outcome of clinical review, details of specific improvement action taken, or reasons why no action taken.	<i>Insert date</i>	<i>Insert date</i>	<i>Insert name of responsible lead for each action.</i>	<i>Insert No. from key above</i>
1.	QPI 16: Brain Imaging. NHS AA to adopt the revised MDT form with 'pop up' prompt regarding brain imaging.					

NHS Forth Valley
Action / Improvement Plan – Lung Cancer

NHS Board:	NHS Forth Valley
Action Plan Lead:	
Date:	

KEY (Status)	
1	Action fully implemented
2	Action agreed but not yet implemented
3	No action taken (please state reason)

No	Action Required	NHS Board Action Taken	Timescales		Lead	Status (see key)
			Start	End		
	<i>Ensure actions mirror those detailed in Audit Report.</i>	Provide detailed outcome of clinical review, details of specific improvement action taken, or reasons why no action taken.	<i>Insert date</i>	<i>Insert date</i>	<i>Insert name of responsible lead for each action.</i>	<i>Insert No. from key above</i>
1.	QPI 8: Radiotherapy in inoperable lung cancer. The provision of all annual data in one report makes timely review by clinicians in advance of publication challenging and leaves no opportunity to monitor and improve performance during the running year. NHS FV to ensure quarterly reports are made available for review by clinicians.					
2.	QPI 8: Radiotherapy in inoperable lung cancer. The MCN will work with NHS FV to review /analyse MDT decision making regarding radical treatment and potential factors influencing this, and determine if further action is possible to improve radical treatment rates.					
3.	QPI 16: Brain Imaging. NHS FV to adopt the revised MDT form with 'pop up' prompt regarding brain imaging.					

NHS Greater Glasgow and Clyde
Action / Improvement Plan – Lung Cancer

NHS Board:	NHSGGC
Action Plan Lead:	
Date:	

KEY (Status)	
1	Action fully implemented
2	Action agreed but not yet implemented
3	No action taken (please state reason)

No	Action Required	NHS Board Action Taken	Timescales		Lead	Status (see key)
			Start	End		
	<i>Ensure actions mirror those detailed in Audit Report.</i>	Provide detailed outcome of clinical review, details of specific improvement action taken, or reasons why no action taken.	<i>Insert date</i>	<i>Insert date</i>	<i>Insert name of responsible lead for each action.</i>	<i>Insert No. from key above</i>
1.	<i>QPI 14: Stereotactic Ablative Radiotherapy (SABR) in inoperable stage I lung cancer.</i> Lung team in BWoSCC to review the disparity around the administration of radiotherapy across the region.					

WoS MCN

Action / Improvement Plan – Lung Cancer

NHS Board:	WoS MCN
Action Plan Lead:	
Date:	

KEY (Status)	
1	Action fully implemented
2	Action agreed but not yet implemented
3	No action taken (please state reason)

No	Action Required	NHS Board Action Taken	Timescales		Lead	Status (see key)
			Start	End		
	<i>Ensure actions mirror those detailed in Audit Report.</i>	Provide detailed outcome of clinical review, details of specific improvement action taken, or reasons why no action taken.	<i>Insert date</i>	<i>Insert date</i>	<i>Insert name of responsible lead for each action.</i>	<i>Insert No. from key above</i>
1.	QPI 15: Pre Treatment Diagnosis. MCN to consider the requirement for a formalised pathway for interventional radiology as part of the ongoing work to explore the possibility of a single diagnostic centre for the region.					