

Audit Report

**Mesothelioma Quality
Performance Indicators**

**Clinical Audit Data:
01 January 2022 to
31 December 2022**

Professor Kevin Blyth
**Consultant Respiratory Physician
National MCN Clinical Lead**

Anna Morton
SCN Programme Manager

Claire Lawrie
SCN Data Manager

Executive Summary

Introduction

This report contains an assessment of the performance of Scotland wide mesothelioma services relating to patients diagnosed with mesothelioma in the twelve months between 1st January 2022 and 31st December 2022.

In order to ensure the success of the Cancer QPIs in driving quality improvement in cancer care, QPIs will continue to be assessed for clinical effectiveness and relevance. The initial baseline review of mesothelioma QPIs took place in 2021. A formal review of the Mesothelioma QPIs took place in November 2022. This clinically led review identified potential refinements to the QPIs and involved key clinicians from each of the Regional Cancer Networks

Results

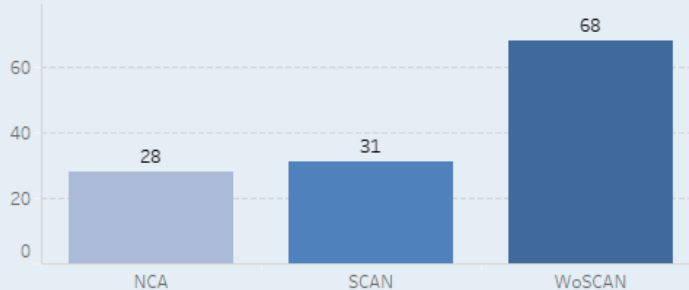
A summary of the Mesothelioma QPI performance for the audit period is presented below, with a more detailed analysis of the results set out in the main report. Data are analysed by location of diagnosis and illustrate NHS Board performance against each target and overall regional performance.

Mesothelioma Quality Performance Indicators

Patients Diagnosed: January 2022 - December 2022

Number Diagnosed with Pleural Mesothelioma:	127
Number Diagnosed with Mesothelioma:	136
Males:	78.7%
Females:	21.3%
Median Age:	77

No. Patients by Region of Diagnosis



QPI Performance

	QPI Target	National Performance	Target Met
QPI 1(i) Diagnostic Imaging	90%	92.9%	✓
QPI 1(ii) Diagnostic Imaging TNM Recorded	95%	96.4%	✓
QPI 2(i) Diagnostic Histopathology	85%	96.0%	✓
QPI 2(ii) Diagnostic Histopathology Subtype Identified	95%	98.3%	✓
QPI 2(iii) Diagnostic Histopathology IHC profiling undertaken	95%	93.0%	✗
QPI 3 National MDT Discussion	95%	97.6%	✓
QPI 8 Post Mortem Examination	<10%	6.3%	✓

Key Achievements

This was the 3rd year of Mesothelioma QPI data collection. QPI target was met nationally on 3 out of the 4 reported QPIs and performance has improved across all the 4 reported QPIs. All regions met QPI 3 however QPI 1, 2 and 8 were not met across all regions so further analysis will be required by the SMN. NCA achieved 100% on QPI 1 (ii), QPI 2 (iii) and QPI 3. In November 2022 QPIs 4,5,6 were revised at formal review and are not reported this year.

It should be noted that the denominator numbers for many of the QPIs are small and that impacts percentages. In some cases where QPI targets have not been achieved this has resulted in non compliance in only a single case in some boards.

Areas for Action

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

- QPI 1 (i) (ii)
- QPI 2 (iii)
- QPI 8

Scotland - Mesothelioma Performance Summary Report

Clinical Leads:	
Date:	16/08/2023
Audit Reporting Period:	01/01/2022 – 31/12/2022

Board
%
(N/D)

Colour Key	
	Above QPI target
	Below QPI target

No. Patients	NCA	SCAN	WoSCAN	Scotland
Mesothelioma of Pleura	28	31	68	127

QPI	QPI target	Year	NCA	SCAN	WoSCAN	Scotland
QPI 1(i) - Diagnostic Imaging Proportion of patients in whom CT scan optimised for pleural assessment (between 60 and 90 seconds) is carried out for first discussion at the national MDT	90%	2022	82.1% (23/28)	96.8% (30/31)	95.6% (65/68)	92.9% (118/127)
		2021	88%	85%	80%	84%
		2020	96%	83%	82%	85%
QPI 1(ii) - Diagnostic Imaging Proportion of patients in whom CT scan optimised for pleural assessment (between 60 and 90 seconds) is carried out for first discussion at the national MDT, and TNM stage is recorded.	95%	2022	100.0% (22/22)	100.0% (27/27)	93.7% (59/63)	96.4% (108/112)
		2021	83%	100%	91%	92%
		2020	96%	92%	97%	96%
QPI 2(i) - Diagnostic: Histopathology Proportion of patients with mesothelioma who have a histopathological diagnosis.	85%	2022	92.6% (25/27)	90.3% (28/31)	100.0% (67/67)	96.0% (120/125)
		2021	83%	96%	94%	92%
		2020	86%	79%	93%	88%
QPI 2(ii) - Diagnostic: Histopathology Proportion of patients with a histopathological diagnosis of mesothelioma who have subtype identified.	95%	2022	100.0% (25/25)	92.9% (26/28)	100.0% (67/67)	98.3% (118/120)
		2021	100%	100%	100%	100%
		2020	96%	100%	98%	98%

QPI	QPI target	Year	NCA	SCAN	WoSCAN	Scotland
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QPI 2(iii) - Diagnostic: Histopathology Proportion of patients with a histopathological diagnosis of epithelioid mesothelioma who have IHC markers profiling undertaken.	95%	2022	84.6% (11/13)	90.0% (18/20)	97.4% (37/38)	93.0% (66/71)
		2021	100%	91%	87%	92%
		2020	94%	95%	100%	98%
QPI 3 - Multidisciplinary Team Proportion of patients with mesothelioma who are discussed at the national mesothelioma MDT meeting.	95%	2022	100.0% (28/28)	96.8% (30/31)	97.1% (66/68)	97.6% (124/127)
		2021	100%	96%	88%	94%
	100%	2020	100%	90%	93%	94%
QPI 8 - Post-Mortem Examination Proportion of patients who have died with a pathological diagnosis of mesothelioma who undergo post-mortem examination.	< 10%	2022	20.0% (3/15)	5.6% (1/18)	0.0% (0/31)	6.3% (4/64)
		2021	0%	0%	0%	0%
		2020	0%	0%	12%	7%

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

Conclusions and Action Required

The three Regional Cancer Networks (North Cancer Alliance (NCA), South East Scotland Cancer Network (SCAN), and West of Scotland Cancer Network (WOSCAN)) aim to promote the highest standards of cancer care and equity of access to cancer services across Scotland. The development and introduction of national Quality Performance Indicators (QPI) represents a major step forward for patients with mesothelioma.

This was the third year of Mesothelioma QPI data collection. Overall performance against the 4 reported Mesothelioma QPIs showed improvement all NHS Regions and Boards. Only QPI 2 (iii) target was not met nationally.

As a result of refinements to QPIs 5, 6, 7 at formal review in November 2022 these are not being reported this year. Data is still being collected and will be reported in the 2023 QPI report.

At the formal review meeting it was also agreed the 100% target QPI 3 target was too ambitious. The target was reduced to 95% which is in line with other tumour sites. This has been implemented for the Jan -Dec 2022 cohort.

It should be noted that denominator numbers for many of the QPIs are small and this impacts on percentages. In some cases where QPI targets have not been achieved this has resulted from non-compliance in only a single case in some Boards.

There are a number of actions required as a consequence of this assessment of performance against the agreed criteria.

NHS Boards are asked to develop local Action/Improvement Plans in response to the findings presented in the report.

1. Introduction

This report contains an assessment of the performance of Scotland wide Mesothelioma services using clinical audit data relating to patients diagnosed with mesothelioma in the twelve months between 1st January 2022 and 31st December 2022. 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 a MCN to assure the quality of care delivered across the three regions.

Twelve months of data were measured against v2.0 of the Mesothelioma Quality Performance Indicators (QPIs)¹ which were implemented for patients diagnosed on or after 01 January 2021.

2. Background

Mesothelioma is a type of cancer that develops in the lining that covers the outer surface of many of the body's organs. Mesothelioma mainly affects the lining of the lungs (pleural mesothelioma), although it can also affect the lining of the abdomen (peritoneal mesothelioma), heart or testicles.

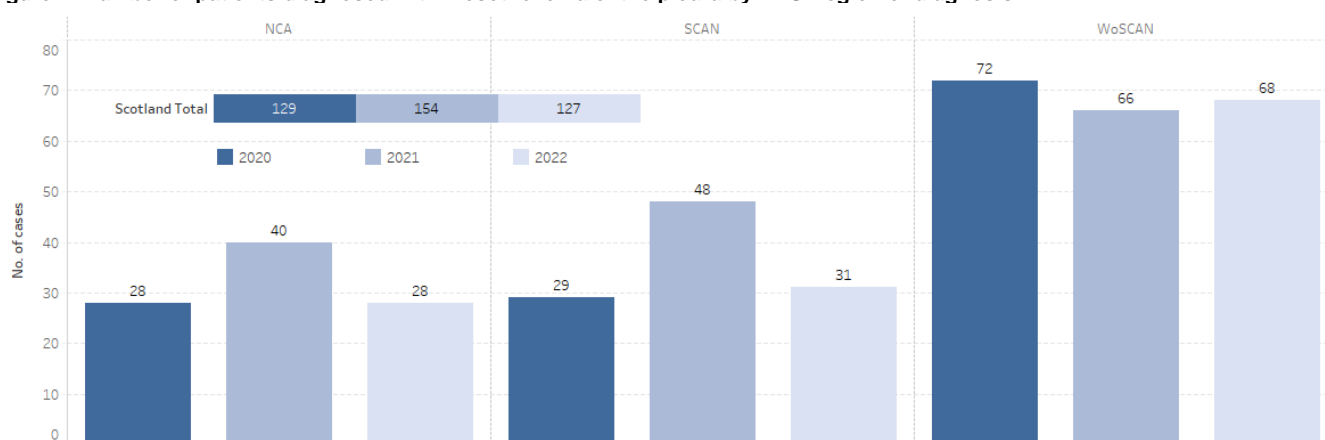
In Scotland approximately 200 people are diagnosed with mesothelioma each year. Exposure to asbestos is the most common cause of mesothelioma.

2.1 National Context

A total of 136 cases of mesothelioma were recorded through audit as diagnosed in Scotland in 2022. This figure is lower than the PHS national average of mesotheliomas diagnosed each year. Differences may be due to the inclusion of mesothelioma cases only confirmed at post mortem within the PHS statistics. The NMCN will carry out an audit to compare QPI data with cancer registry data to ensure that all appropriate cases are being captured.

The QPI analysis only focusses on diagnoses of mesothelioma of the pleura, of which there was 127 cases diagnosed in Scotland in 2022. The number of patients diagnosed with mesothelioma of the pleura within each NHS Region is presented in Figure 1.

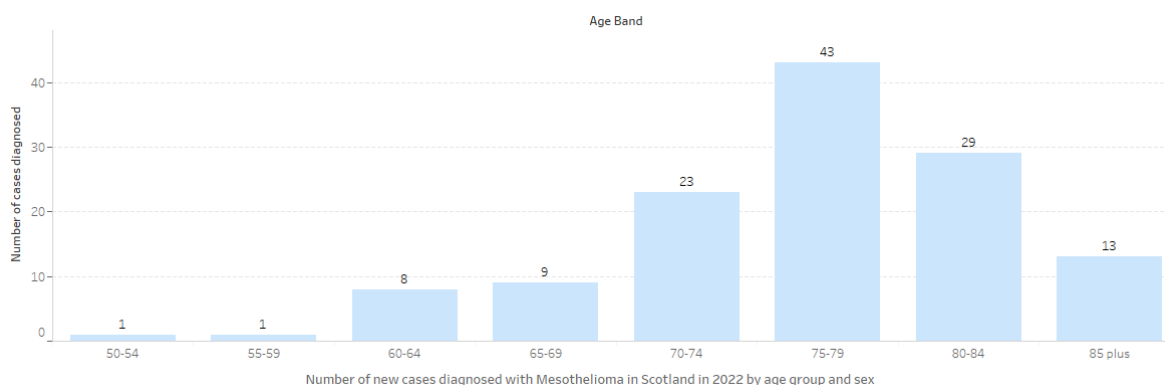
Figure 1: Number of patients diagnosed with mesothelioma of the pleura by NHS Region of diagnosis.



2.2 Age and Gender Distribution

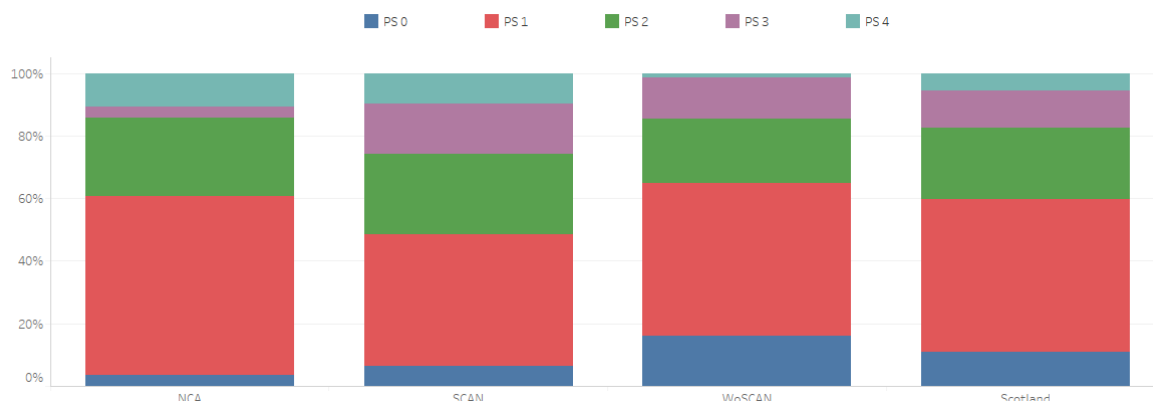
Figure 2 illustrates the distribution of mesothelioma cancer cases by age. Mesothelioma continues to be more prevalent in patients' ≥ 70 years with 78.2% of the total cases diagnosed occurring in patients within this age group. Between January 2022 and December 2022, 78.7% of the cases diagnosed were male with females accounting for 21.3% of cases.

Figure 2: Age range of patients diagnosed with mesothelioma.



2.3 Performance Status

Figure 3: Performance status by region.



	NCA		SCAN		WoSCAN		Scotland	
	n	%	n	%	n	%	n	%
PS 0	1	3.6%	2	6.5%	11	16.2%	14	11.0%
PS 1	16	57.1%	13	41.9%	33	48.5%	62	48.8%
PS 2	7	25.0%	8	25.8%	14	20.6%	29	22.8%
PS 3	1	3.6%	5	16.1%	9	13.2%	15	11.8%
PS 4	3	10.7%	3	9.7%	1	1.5%	7	5.5%
Total	28	100.0%	31	100.0%	68	100.0%	127	100.0%

Figure 3 shows the WHO Performance Status (PS) of patients diagnosed with mesothelioma, with 0 being fully active and 4 being completely disabled.

3. Methodology

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

4. Performance against Quality Performance Indicators (QPIs)

Results for each QPI are shown in detail in the following sections. Data are presented by region of diagnosis and illustrate regional performance against each target and overall national performance for each performance indicator.

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.

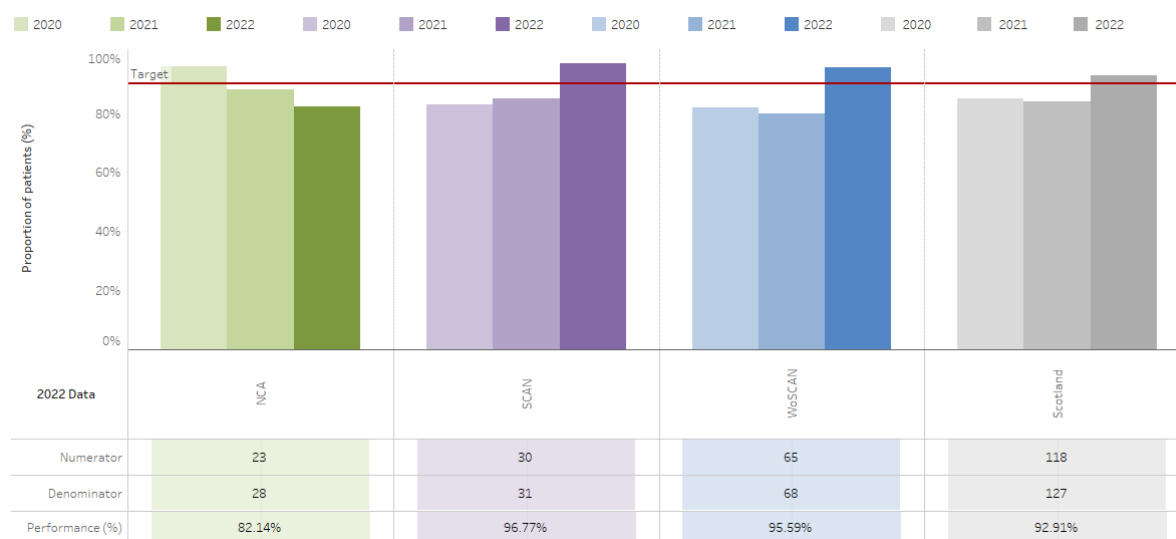
Specific national, regional and NHS Board actions have been identified to address issues highlighted through the data analysis.

QPI 1: Diagnostic Imaging

Thoracic computed tomography (CT) scan optimised for pleural assessment should be undertaken as standard for diagnosis and staging in patients with mesothelioma.¹ The target for this QPI is 90% with the tolerance designed to account for patients with significant renal impairment (e.g. eGFR <30) or allergies to iodinated contrast. In addition, it accounts for those patients in whom diagnosis was an incidental finding on non-contrast CT, and additional imaging is not clinically required¹.

Description:	(i) Proportion of patients in whom CT scan optimised for pleural assessment (between 60 and 90 seconds) is carried out for first discussion at the national MDT.
Numerator:	Number of patients with mesothelioma in whom CT scan optimised for pleural assessment was carried out for first discussion at the national MDT meeting.
Denominator:	All patients diagnosed with mesothelioma.
Exclusions:	Patients who refused investigation.
Target:	90%

Figure 4: The proportion of patients in whom CT scan optimised for pleural assessment (between 60 and 90 seconds) is carried out for first discussion at the national MDT.



Performance across Scotland was 92.91% against the 90% target with 118 of 127 patients with CT scan optimised for pleural assessment carried out for first discussion at the national MDT meeting.

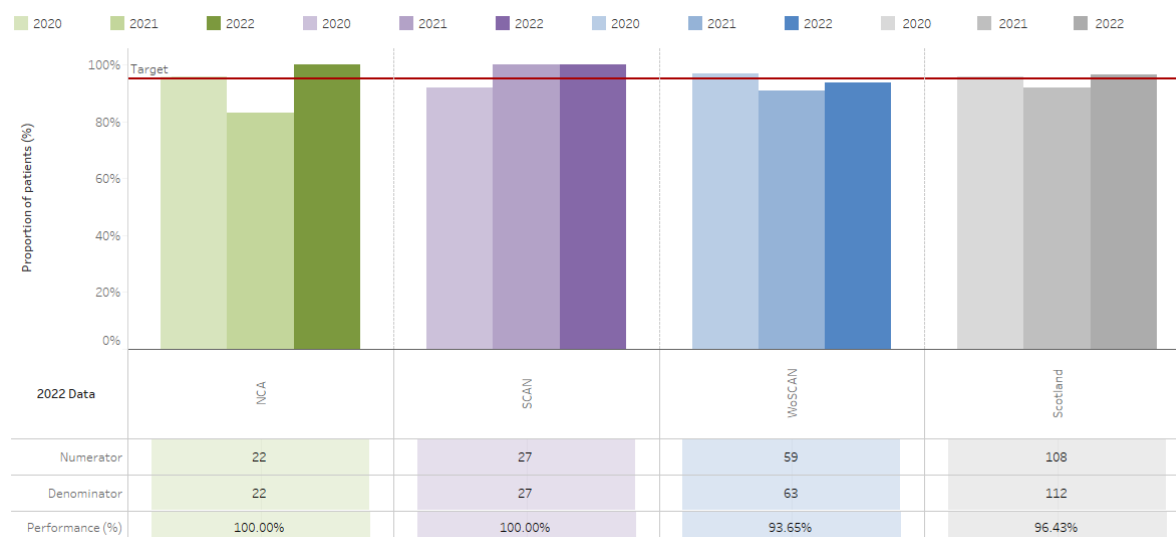
Only NCA did not meet the target with 82.14%, 23 out of 28 patients. NHS Highland was noted as 50% against the 90% target. The board commented on the small number of patients and that this largely reflects imaging requested prior to the involvement of the respiratory team. The SMN clinical team is working with radiology colleagues to look at a system to improve this. NHS Grampian was also noted as 87.5%, with 1 patient not meeting the target.

At the national data review meeting in 2021 there was discussion around how contrast timing is determined. It was confirmed that the MDT form had been adjusted to capture this data and that CTs are checked if contrast, non-contrast or arterial and recorded on the MDT form. It was noted there was a potential for error and it was decided that a validation study would be carried out to determine if correct

contrast phase was being recorded accurately at time of MDT discussion This study found an error rate of 7.79%. Following on from this review, the Radiologist now confirms CT phase during MDT discussion.

Description:	(ii) Proportion of patients in whom CT scan optimised for pleural assessment (between 60 and 90 seconds) is carried out for first discussion at the national MDT, and TNM stage is recorded.
Numerator:	Number of patients with mesothelioma in whom CT scan optimised for pleural assessment was carried out for first discussion at the national MDT meeting, who have TNM stage recorded.
Denominator:	Number of patients with mesothelioma in whom CT scan optimised for pleural assessment was carried out for first discussion at the national MDT meeting.
Exclusions:	No exclusions.
Target:	95%

Figure 5: The proportion of patients in whom CT scan optimised for pleural assessment (between 60 and 90 seconds) is carried out for first discussion at the national MDT, and TNM stage is recorded.



Overall, 96.43% of patients in whom CT scan was optimised for pleural assessment and carried out for first discussion at the national MDT had TNM recorded, which is above the 95% QPI target.

Both SCAN and NCA achieved 100% compliance.

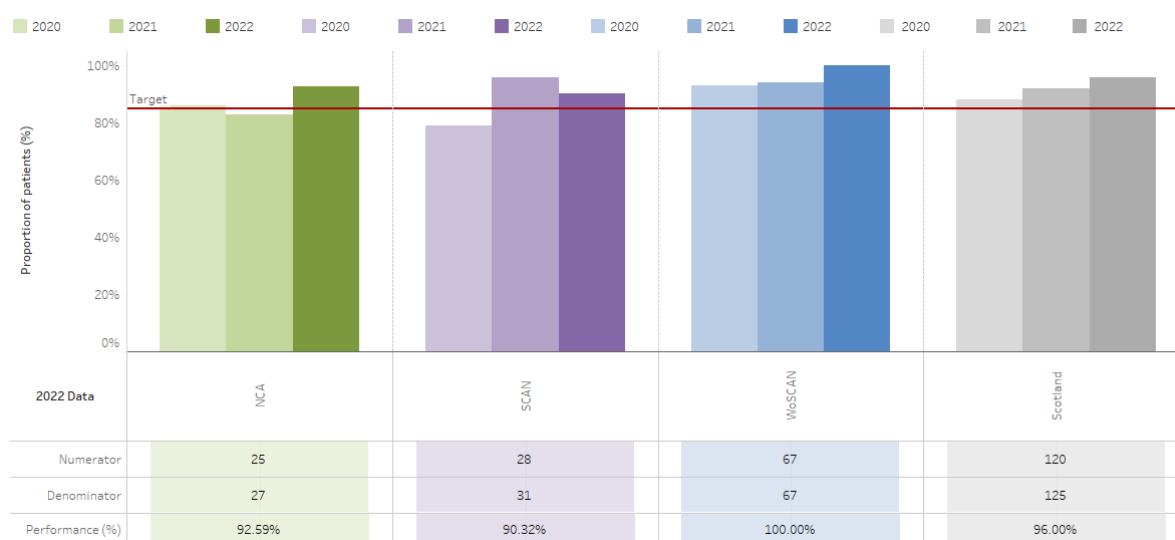
WoSCAN did not meet the target with 93.65%. NHS AA was noted as 75%. NHS AA commented that 1 patient out of 4 had not met the target. This patient had CT but not TNM recorded as pathway was complicated as interim pathology was thought to be sarcoma. NHS AA have since joined the national weekly MDT.

QPI 2: Diagnostic: Histopathology

Patients should have a histopathological diagnosis of Mesothelioma. A definitive histological diagnosis of mesothelioma is valuable in helping inform patients and carers about the nature of the disease and the likely prognosis and to facilitate compensation claims¹. The tolerance within this target is to account for patients in whom pursuit of tissue is not clinically safe or appropriate¹.

Description:	(i) Proportion of patients with mesothelioma who have a histopathological diagnosis.
Numerator:	Number of patients with mesothelioma who have a histopathological diagnosis.
Denominator:	All patients diagnosed with mesothelioma.
Exclusions:	Patients who refuse investigation.
Target:	85%

Figure 6: The proportion of patients with mesothelioma who have a histopathological diagnosis.



Of the 127 patients diagnosed with mesothelioma, 120 had a pathological diagnosis. This resulted in a national performance of 96%, against the 85% QPI target. All regions meet the QPI target.

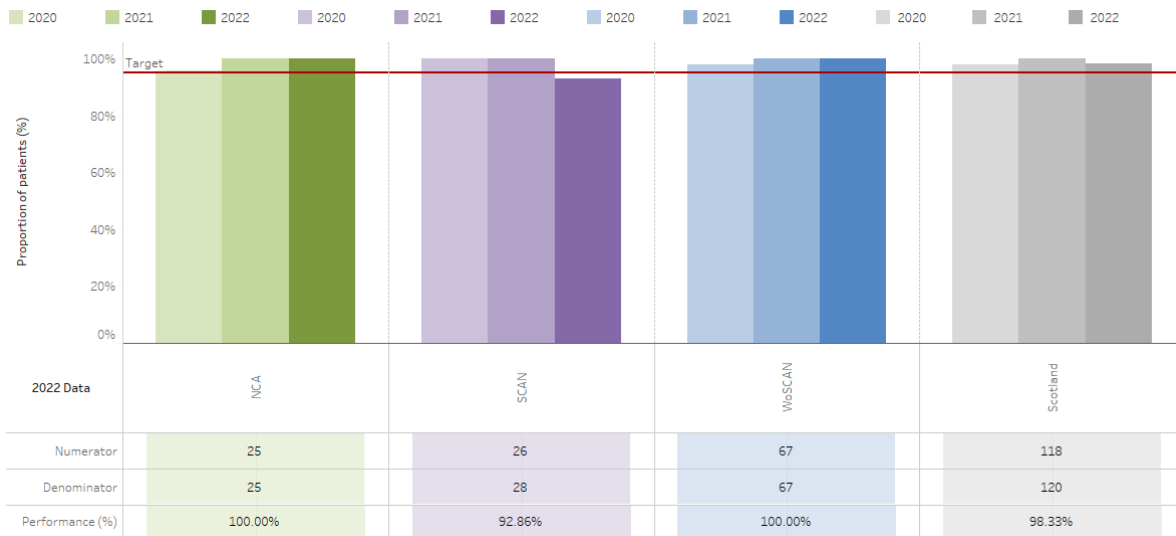
It should be noted that since medical thoracoscopy was introduced in NHS Grampian in early 2022 performance has improved from a non-compliant 83% to 92%.

Description:	(ii) Proportion of patients with a histopathological diagnosis of mesothelioma who have subtype identified.
Numerator:	Number of patients with a histopathological diagnosis of mesothelioma who have subtype identified.
Denominator:	All patients with a histopathological diagnosis of mesothelioma.

Exclusions: No exclusions.

Target: 95%

Figure 7: The proportion of patients with a histopathological diagnosis of mesothelioma who have subtype identified.

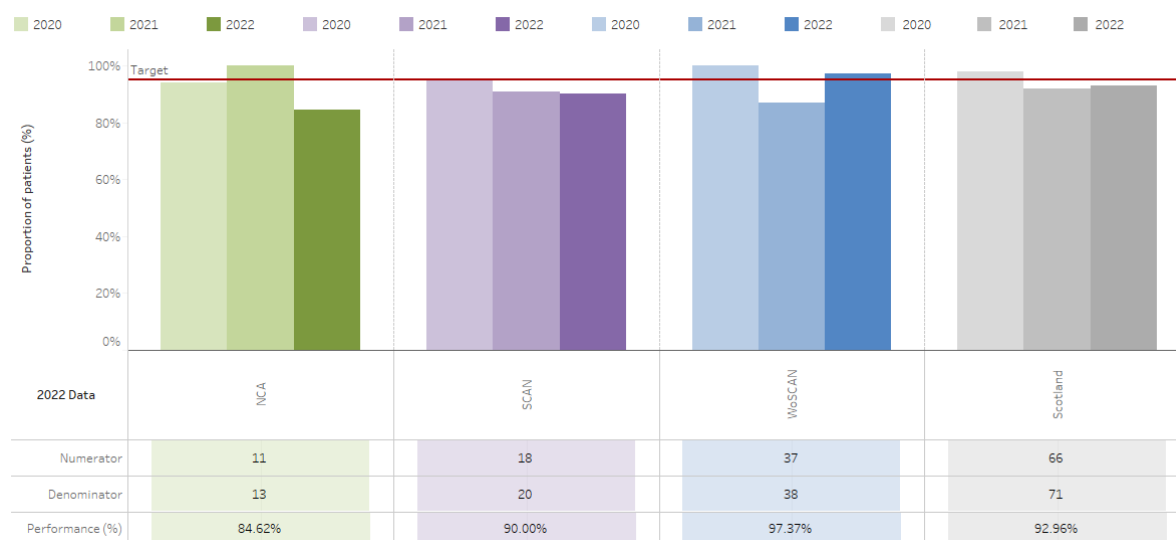


Of the 118 patients who had a histopathological diagnosis of mesothelioma, all had a subtype identified resulting in a national performance of 98.3% against the 95% QPI target. This is down on last year's performance of 100% against QPI target.

SCAN achieved 92.86% and upon clinical review noted one patient's histopathology could not be sub-typed due to insufficient tissue available and 1 patient, with initial histopathology of non-specific type, had declined invasive investigation for further pathology (i.e. VATS procedure).

Description:	(iii) Proportion of patients with a histopathological diagnosis of epithelioid mesothelioma who have IHC marker profiling undertaken.
Numerator:	Number of patients with a histopathological diagnosis of epithelioid mesothelioma who have an appropriate immuno-histochemical panel undertaken on the biopsy.
Denominator:	All patients with a histopathological diagnosis of epithelioid mesothelioma.
Exclusions:	No exclusions.
Target:	95%

Figure 8: The Proportion of patients with a histopathological diagnosis of epithelioid mesothelioma who have IHC marker profiling undertaken.



Of the 71 patients with a histopathological diagnosis of mesothelioma who had a subtype identified, 66 patients with a diagnosis of epithelioid mesothelioma had an appropriate immuno-histochemical panel undertaken on biopsy. This resulted in an overall national performance of 92.96% against the 95% target.

WoSCAN met the target with 97.37%.

All cases not meeting the QPI were reviewed and reasons provided included cases where IHC marker profiling was carried out but the report did not state which IHC markers were examined and cases which had markers undertaken but not the required number.

Discussion at the data review meeting suggested that evidence has progressed since initial IHC marker panel was defined and new markers, e.g. Claudin-4 are now appropriate for use in the diagnosis of MPM.

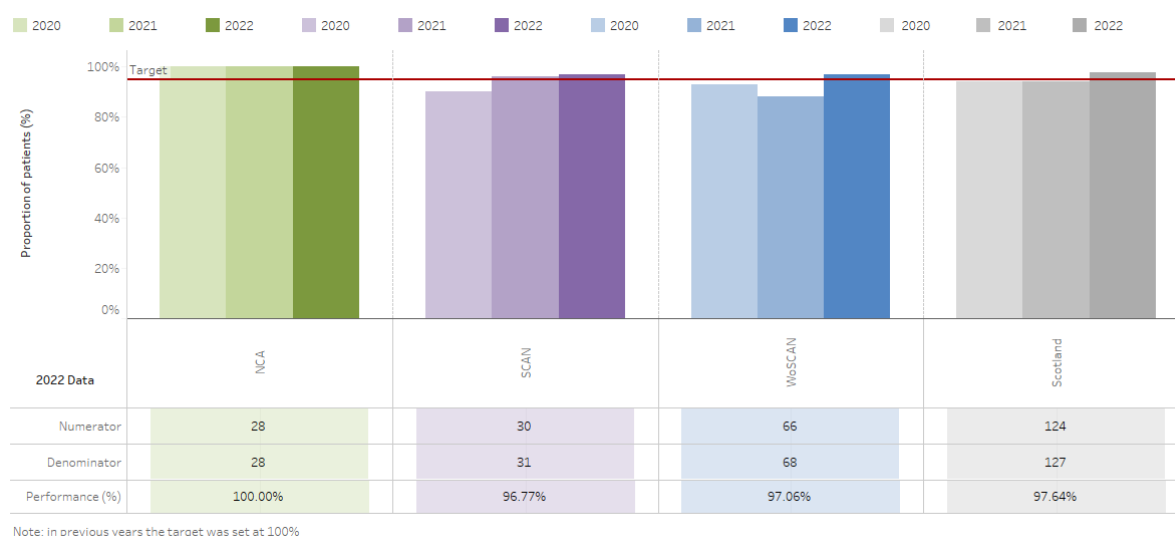
Action Required:-

- NMCN to liaise with Pathology to compile an updated list of ICC markers and additional markers to be added to QPI.

QPI 3: Multidisciplinary Team

Description:	Proportion of patients with mesothelioma who are discussed at the national mesothelioma MDT meeting.
Numerator:	Number of patients with mesothelioma discussed at the national mesothelioma MDT.
Denominator:	All patients diagnosed with mesothelioma.
Exclusions:	No exclusions.
Target:	95%

Figure 9: The proportion of patients with mesothelioma who are discussed at the national mesothelioma MDT meeting.



There was national discussion at the data review meeting in 2022 with regards to the 100% target being too ambitious and as a result the target was reduced to 95% which would be in line with other tumour sites. This has been implemented for the Jan -Dec 2022 cohort.

Overall, in Scotland 97.6% of patients were discussed at the national mesothelioma meeting. This is an increase 93.5%. All three regions achieved over the new target of 95% and NCA again achieved 100%

WoS achieved 97.1% against the QPI target. This was an increase on 88% in 2021. The majority of cases not meeting the target were from NHSAA where performance was noted as 80%. NHSSAA commented that one patient was not referred to the regional MDT in 2022 and since mid-2022 they had been regularly attending the national MDT. As a result, NHSAA referrals have increased from 20% in 2021 to 80% in 2022.

SCAN also met the 95% target with 96.8% compared to 96% in 2021.

QPI 8: Post-Mortem Examination

Patients with a diagnosis of mesothelioma should only undergo post-mortem examination in the absence of pathological evidence of diagnosis¹.

Description:	Proportion of patients who have died with a pathological diagnosis of mesothelioma who undergo post-mortem examination.
Numerator:	Number of patients who have died with a pathological diagnosis of mesothelioma who undergo post- mortem examination.
Denominator:	All patients who have died with a pathological diagnosis of mesothelioma.
Exclusions:	None.
Target:	<10%

Of the 64 patients who died with a pathological diagnosis of mesothelioma 4 underwent post-mortem examination, resulting in a performance of 6.3%, and achieving the <10% target.

Acknowledgements

This report has been prepared using clinical audit data provided by each of the fourteen NHS Boards in Scotland. We would like to thank colleagues in the clinical effectiveness departments throughout Scotland for gathering, submitting and verifying these data. We would also like to thank the clinicians, nurses and others involved in the management of patients with mesothelioma for their contribution to the clinical audit process.

Abbreviations

CT	Computed tomography
eCASE	Electronic Cancer Audit Support Environment
IHC	Immuno-histochemical
IPC	Indwelling Pleural Catheter
LATS	Local Anaesthetic Thoracoscopy
MCN	Managed Clinical Network
MDT(s)	Multidisciplinary Team(s)
NCA	North Cancer Alliance
NMCN	National Managed Clinical Network
PS	Performance Status
QPI(s)	Quality Performance Indicator(s)
RCAG	Regional Cancer Advisory Group
SACT	Systemic Anti-Cancer Therapy
SCAN	South East Scotland Cancer Network
SCRN	Scottish Cancer Research Network
TNM	Tumour, Nodes, Metastases (staging system)
WGH	Western General Hospital
WoS	West of Scotland
WoSCAN	West of Scotland Cancer Network

References

1. Healthcare Improvement Scotland. Mesothelioma Quality Performance Indicators, June 2019. [Accessed on: 7th December 2021]. Available at: http://www.healthcareimprovementscotland.org/our_work/cancer_care_improvement/cancer_qpis/quality_performance_indicators.aspx
2. Information Services Division. Data Definitions for the National Minimum Core Data Set to support the introduction of Mesothelioma Quality Performance Indicators [Accessed on: 7th December 2021]. Available at: <https://www.isdscotland.org/Health-Topics/Cancer/Cancer-Audit/>

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Appendix 1: Meta Data

Report Title	Cancer Audit Report: Mesothelioma Quality Performance Indicators
Time Period	Patients diagnosed between 01 January 2022 to 31 December 2022
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 17 th August 2023
Methodology	<p>Analysis was performed centrally for the region by the NSS Information Management 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.</p>

