Brain and Central Nervous System Cancers Clinical Audit Report

Quality Performance Indicators

01 January – 31 December 2023

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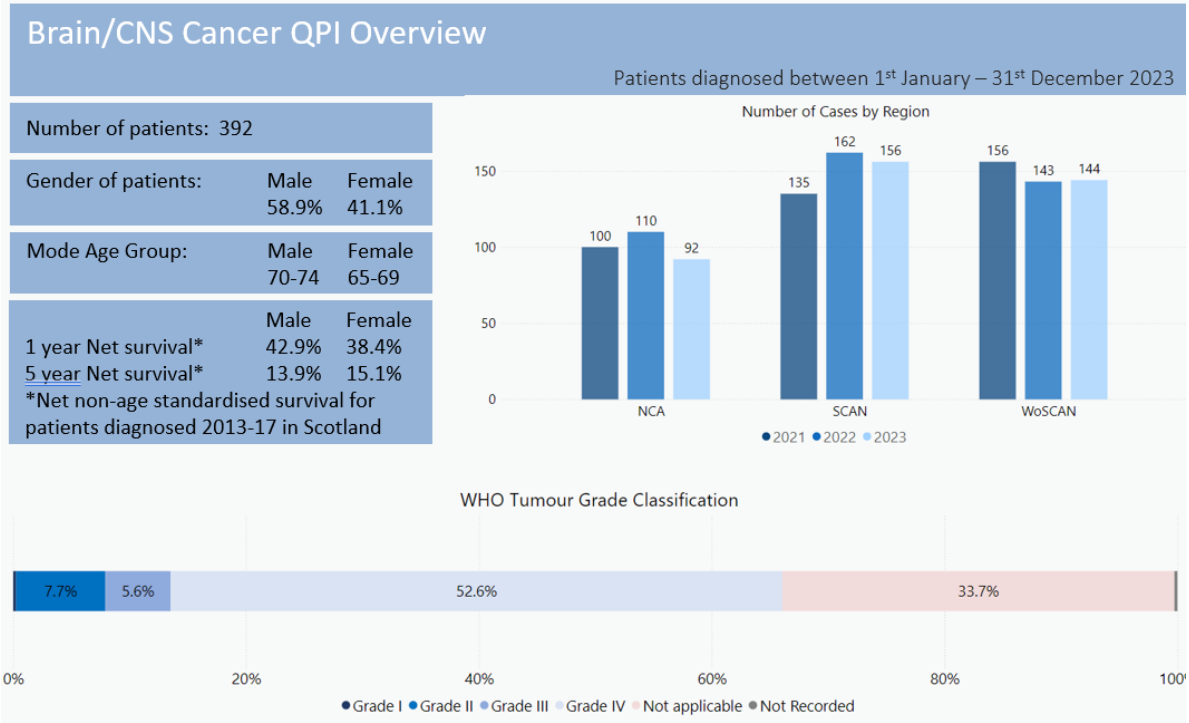
Brain/CNS Cancer QPI Overview 2023



Performance (%)

QPI 1: Documentation of Performance Status	95% 96.6% ⇧		QPI 7: Early Post-Operative Imaging	90% 96.2% ⇩
QPI 2: Documentation of MDT Meeting	90% 87.6% ⇩		QPI 9: Access to Adjuvant Treatment	90% 89.5% ⇧
QPI 3: Molecular Analysis	i 90% 60.0% ⇧	ii 90% 87.5% ⇩	QPI 11: Seizure Management	95% 38.7% ⇩
QPI 4: Neuropathological Diagnosis	95% 98.1% ⇧		QPI 12: Key Worker	95% 46.2% ⇩
QPI 6: Maximal Surgical Resection	40% 56.1% ⇧		QPI 13: 30 day mortality after Treatment- (i) Surgery (ii) Chemoradiotherapy (iii) Radiotherapy	i <5% 4.2% ⇩ ii <5% 4.4% ⇩ iii <5% 3.9% ⇩

Executive Summary

Introduction

This report presents an assessment of the performance of Adult Neuro-Oncology services using clinical audit data relating to patients diagnosed with brain and/or central nervous system (CNS) cancers across Scotland from 01 January 2023 to 31 December 2023. These results are measured against the Brain and CNS Cancer quality performance indicators (QPIs), which were introduced for patients diagnosed from 01 January 2014, for the tenth consecutive year.[1]

Methodology

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

A summary of the Brain/CNS Cancer QPIs 2023 clinical audit data is presented below, with a more detailed analysis within the main report. Commentary provided by NHS Boards, Regions or MDT/neuro-oncology centre provide insight into the circumstances around each QPI result to assist the improvement process. Specific NHS Board, Region or MDT/neuro-oncology centre actions will be identified to address any issues highlighted in the report.

Results

The overall number of newly diagnosed Brain/CNS patients in Scotland identified by clinical audit was 392, down from the 415 identified by the 2022 audit and returning to levels observed in 2021. Diagnoses declined slightly within SCAN (down 3.7%) and NCA (down 16.4%) and remained stable in WoSCAN (up 0.7%) compared to the previous year. This is likely due to natural annual fluctuations.

Summary of QPI Results

Colour Key	
	Above QPI target
	Below QPI target

QPI	QPI target	Year	Performance by NHS Board of Diagnosis			
			NCA	SCAN	WoSCAN	Scotland
QPI 1: Documentation of Performance Status Proportion of newly diagnosed patients with brain/CNS cancer who have a documented WHO performance status at the time of multidisciplinary team (MDT) discussion.	95%	2023	96.7% (87/90)	94.2% (145/154)	99.3% (143/144)	96.6% (375/388)
		2022	92.7%	92.6%	99.3%	94.9%
		2021	94.0%	94.6%	96.2%	95.1%
QPI 2: Documentation of MDT meeting Proportion of patients with Brain/CNS cancer who are discussed at MDT meeting before surgery.	90%	2023	89.1% (49/55)	94.2% (98/104)	80.0% (80/100)	87.6% (227/259)
		2022	92.2%	94.1%	79.8%	88.1%
		2021	91.5%	90.9%	66.7%	79.9%
***QPI 3(i): Molecular Analysis** Proportion of patients with biopsied or resected gliomas who undergo 1p/19q molecular analysis of tumour tissue within 21 days of surgery.	90%	2023	62.5% (5/8)	58.8% (10/17)	60.0% (9/15)	60.0% (24/40)
		2022	37.5%	69.2%	52.9%	55.3%
		2021	50.0%	66.7%	47.6%	56.3%
***QPI 3(ii): Molecular Analysis** Proportion of patients with biopsied or resected gliomas who undergo MGMT promoter hypermethylation status testing within 21 days of surgery.	90%	2023	74.4% (29/39)	92.0% (69/75)	89.7% (70/78)	87.5% (168/192)
		2022	89.1%	91.5%	89.3%	90.1%
		2021	52.1%	86.2%	22.5%	48.4%
QPI 4: Neuropathological Diagnosis Proportion of patients with brain/CNS cancer where the pathology report contains a full set of data items (as defined by the Royal College of Pathologists).	95%	2023	98.1% (52/53)	100.0% (105/105)	96.0% (96/100)	98.1% (253/258)
		2022	93.2%	100.0%	92.2%	95.5%
		2021	98.3%	100.0%	97.6%	98.5%
***QPI 6: Maximal surgical resection** Proportion of patients with malignant glioma (with enhancing component on pre-operative imaging) who undergo surgical resection where 90% or greater reduction in tumour volume is achieved provided it is considered consistent with safe outcome.	40%	2023	42.9% (9/21)	55.1% (27/49)	61.3% (38/62)	56.1% (74/132)
		2022	45.0%	50.7%	63.9%	55.9%
		2021	48.0%	59.6%	60.5%	58.3%

QPI	QPI target	Year	Performance by NHS Board of Diagnosis			
			NCA	SCAN	WoSCAN	Scotland
***QPI 7: Early Post-Operative Imaging** Proportion of patients with malignant glioma (with enhancing component on pre-operative imaging) who receive early post-operative imaging with MRI within 3 days (72 hours) of surgical resection.	90%	2023	90.5% (19/21)	100.0% (48/48)	95.1% (58/61)	96.2% (125/130)
		2022	100.0%	100.0%	95.8%	98.1%
		2021	100.0%	100.0%	98.8%	99.4%
QPI 9: Access to Adjuvant Treatment Proportion of patients with high grade glioma (WHO Grade III and IV) undergoing surgery who commence their oncological treatment (chemotherapy, radiotherapy or chemoradiotherapy) within 6 weeks of surgery.	90%	2023	74.1% (20/27)	93.1% (67/72)	92.1% (58/63)	89.5% (145/162)
		2022	72.5%	91.2%	87.3%	85.4%
		2021	61.5%	83.3%	95.2%	84.2%
QPI 11: Seizure Management Proportion of patients with brain/CNS cancer presenting with seizures at diagnosis who are seen by a neurologist or a named ESN within four weeks of MDT discussion.	95%	2023	73.1% (19/26)	46.9% (23/49)	2.8% (1/36)	38.7% (43/111)
		2022	75.0%	36.2%	17.9%	40.4%
		2021	63.2%	73.2%	23.3%	54.4%
QPI 12: Key Worker Proportion of patients with Brain/CNS cancer who have an identified key worker by the first MDT meeting.	95%	2023	37.9% (22/58)	90.7% (98/108)	0.0% (0/94)	46.2% (120/260)
		2022	42.3%	90.1%	0.0%	46.4%
		2021	40.6%	84.9%	0.0%	37.4%
***QPI 13: Mortality-Surgery** Proportion of patients with Brain/CNS cancer who die within 30 days of surgery.	< 5%	2023	5.4% (3/56)	3.8% (4/105)	4.0% (4/101)	4.2% (11/262)
		2022	4.8%	1.0%	2.8%	2.6%
		2021	5.2%	9.0%	2.3%	5.0%
QPI 13: Mortality- Radiotherapy Proportion of patients with Brain/CNS cancer who die within 30 days of radiotherapy.	< 5%	2023	5.9% (1/17)	5.6% (3/54)	0.0% (0/19)	4.4% (4/90)
		2022	11.1%	3.6%	0.0%	3.1%
		2021	7.7%	14.3%	3.7%	9.8%
QPI 13: Mortality-Chemoradiotherapy Proportion of patients with Brain/CNS cancer who die within 30 days of chemoradiotherapy.	< 5%	2023	13.0% (3/23)	0.0% (0/31)	2.0% (1/49)	3.9% (4/103)
		2022	5.9%	0.0%	2.2%	2.6%
		2021	3.8%	2.6%	5.8%	4.5%

Conclusions

The continued support and commitment of Scottish Adult Neuro-Oncology Network (SANON) members ensures the delivery of high-quality care to brain and CNS cancer patients across the country.

Patients with brain/CNS cancer receive high quality care across Scotland and the results presented in this report demonstrate the continued commitment to improve the experience and care received across the patient pathway. Case ascertainment and data capture is of a high standard enabling robust assessment of performance against QPIs.

All QPIs presented in this report were subject to recent evaluation during the third cycle of the Brain and CNS cancers Formal Review. Changes identified will be implemented for the next cohort of patients diagnosed during 2024. QPI measures that have presented continued and specific challenges were will be amended to capture and report on newly identified best practice (Molecular Analysis, QPI 3), set more realistic and clinically appropriate timelines (Seizure Management, QPI 11) or archived due to definition and documentation challenges (Key Worker, QPI 12) or because there has been consistent achievement of the target over the preceding years (Neuropathological Diagnosis, QPI 4).[6, 7]

Each NHS Board has provided detailed comments on the results where QPI targets were not met. Board feedback indicates valid clinical reasons and patient locality or co-morbidities that influenced patient management. There are some areas where there are specific challenges that require action either within or outwith specific boards/centres which will be discussed later in the report. Additionally, these Boards have indicated where positive action has already been taken at a local level to address any issues highlighted through the QPI data analysis. It is anticipated that these positive changes will result in improved performance going forward.

Action Required

- QPI 1: Continue communications with referrers to highlight the need to provide and record this data on referral and with MDT chairs to stress the importance to record this data at MDT
- QPI 2: Glasgow to review theatre access for urgent cases and consider ways of ensuring that an oncology specialist is available for these cases
- QPI 3: will be amended
- QPI 4: will be archived

- QPI 6: Aberdeen to hold peer discussion of detail around eligible cases considered not achievable for maximal surgical resection. Glasgow to improve documentation.
- QPI 7: No action required
- QPI 9: NHS Highland to consider staffing and equipment shortfall. Pathology issues have been raised as an issue by two separate regions. The network should liaise with relevant networks (Scottish Strategic Network for Genomic Medicine SSNGM) and the Scottish Pathology Network (SPaN)) to support their work in addressing related issues.
- QPI 11: will be amended
- QPI 12: will be archived
- QPI 13: Aberdeen to consider process for surgical case selection. Aberdeen and Edinburgh to consider process for radiotherapy case selection. Improved communication between Boards within NCA to aid patient pathway audit

Introduction

National Cancer QPIs, introduced for patients diagnosed on or after 01 January 2014, are used to measure the Adult Neuro-Oncology services across Scotland for a twelve-month period. This report presents the assessment of the Adult Neuro-Oncology services performance using clinical audit data for patients diagnosed with brain and/or central nervous system (CNS) cancers within Scotland from 01 January 2023 to 31 December 2023.

The success of the National Cancer QPIs in driving quality improvement in cancer care across NHS Scotland is dependent on their clinical relevance and focus on improving the quality of patient care. To ensure this, a programme of QPI formal review was implemented to review all tumour specific QPIs following three years of comparative reporting. The third cycle of formal review of the Brain/CNS QPIs was initiated in April 2023. The analysis contained in this report uses the revised QPIs published in February 2021. Twelve months of data is presented alongside the previous two years where results have remained comparable. Future reports will continue to compare clinical audit data in successive years to further illustrate trends.

Background

Established in 2006, the Scottish Adult Neuro-Oncology Network (SANON) links specialty health professionals, allied health professionals, researchers, patient and carer representatives and voluntary sector representatives to enable collaboration to improve the delivery of care for patients in Scotland. The QPIs developed by Healthcare Improvement Scotland (HIS) [1] working with SANON and the regional cancer networks ensure NHS Boards focus on:

- improving survival
- improving patient experience
- reducing differences in practice
- providing safe, effective, person-centred care

Brain cancer is one of the less-survivable cancers identified as an area of focus for the Scottish Government's Strategic Priorities for 2023-33.[2]

The table below details the four Multi-Disciplinary Teams (MDT) which manage all cases of brain and CNS cancer in Scotland. There are five specialist centres carrying out neuro-oncology treatment in Scotland, which include surgery (excluding Inverness), chemotherapy and radiotherapy. Patients may receive diagnostic or palliative care in their local hospital where appropriate. The majority of patients are referred to one of the four MDTs for specialist management.

Table 1: Neuro-Oncology Specialist Centre MDT locations

Neuro-Oncology MDT	Constituent Hospital(s)
Aberdeen/Inverness	Aberdeen Royal Infirmary (surgery and oncology) Raigmore Hospital – Inverness (oncology)
Dundee	Ninewells Hospital (surgery and oncology)
Edinburgh	Edinburgh Royal Infirmary (surgery from July 2020) and Western General Hospital (surgery until June 2020 and oncology)
Glasgow	Queen Elizabeth University Hospital (surgery) and Beatson West of Scotland Cancer Centre (oncology)

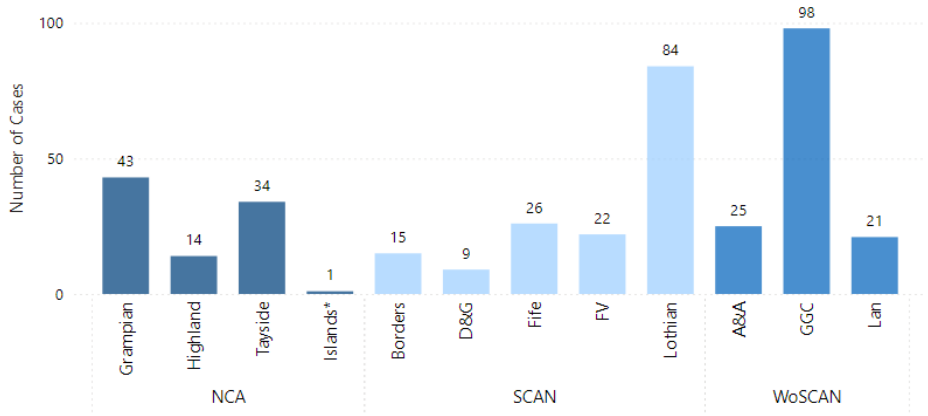
National Context

Brain and CNS cancers are relatively rare cancers with 468 diagnoses reported by Public Health Scotland in 2021.[3] The 2023 QPI clinical audit identified 392 patients diagnosed with a new primary cancer of the brain or CNS in Scotland.

The distribution of the 392 newly diagnosed cases in 2023 is presented in Figure 1 by location of diagnosis across the fourteen NHS Boards. This indicates slightly more diagnoses in SCAN relative to the adult population distribution in this region as

described by the 2022 mid-year population estimates as the majority of the Scottish adult population (44.9%) resides within the West of Scotland (WoS).

Figure 1: Number of patients diagnosed with brain or CNS cancer across Scotland by NHS Board, 2023



NCA	Grampian	Highland	Tayside	Islands*		Total
No. of cases	43	14	34	1		92 (23.5%)
SCAN	**Borders**	**D&G**	**Fife**	**FV**	**Lothian**	**Total**
No. of cases	15	9	26	22	84	156 (39.8%)
WoSCAN	**A&A**	**GGC**	**Lan**			**Total**
No. of cases	25	98	21			144 (36.7%)

**Island Boards- Orkney, Shetland and Western Isles*

The tumour morphology of cases diagnosed in the 2023 audit data is detailed in Table 2 below and is classified according to the International Classification of Diseases for Oncology (ICD-O 3). The majority of cases (61.7%) have astrocytic/oligodendroglial tumour morphology. Cases noted as "Not Applicable" did not have a sample sent for pathology testing.

Table 2: Tumour morphology for Brain/CNS cancer patients across Scotland by Region of Diagnosis, 2023

	Region of Diagnosis							
	NCA		SCAN		WOSCAN		Scotland	
Tumour Type	n	%	n	%	n	%	n	%
Astrocytic and Oligodendroglial	51	55.4%	95	60.9%	96	66.7%	242	61.7%
Embryonal	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Ependymal	1	1.1%	4	2.6%	1	0.7%	6	1.5%
Meningioma	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Pineal Region	0	0.0%	0	0.0%	1	0.7%	1	0.3%
Other Glioma	2	2.2%	0	0.0%	1	0.7%	3	0.8%
Other Astrocytic	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Negative Pathology	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Not Applicable	36	39.1%	51	32.7%	43	29.9%	130	33.2%
Not Assessable	2	2.2%	1	0.6%	0	0.0%	3	0.8%
Not Recorded	0	0.0%	5	3.2%	2	1.4%	7	1.8%
Total No of Pts	**92**		**156**		**144**		**392**	

The World Health Organisation (WHO) tumour grade classification scale is used to determine tumour aggressiveness and to estimate prognosis. The proportion of 2023 audit cases assigned to each tumour grade is illustrated in Table 3. The majority of cases are Grade 4 (52.6%) which is associated with poorer outcomes. Cases have been assigned as “Not Applicable” where no sample has been sent to pathology for analysis.

Table 3: Tumour grade for Brain/CNS cancer diagnosed patients across Scotland by Region of Diagnosis, 2023

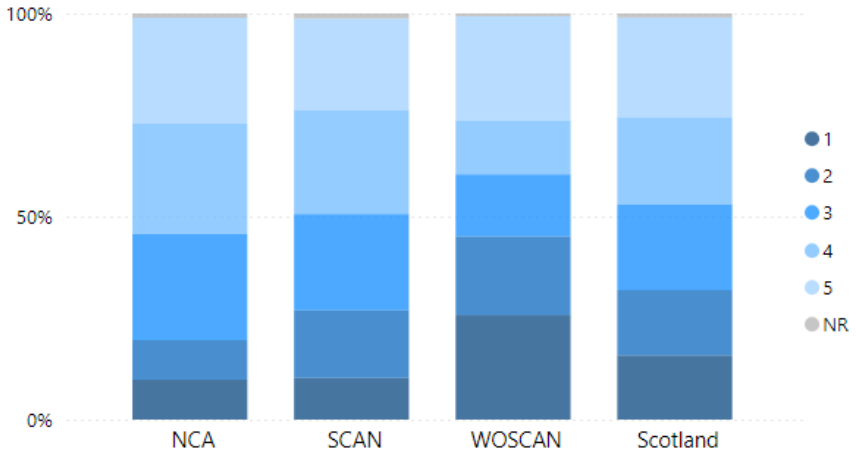
	Region of Diagnosis							
	NCA		SCAN		WOSCAN		Scotland	
WHO Grade*	n	%	n	%	n	%	n	%
1	0	0.0%	0	0.0%	1	0.7%	1	0.3%
2	6	6.5%	14	9.0%	10	6.9%	30	7.7%
3	5	5.4%	10	6.4%	7	4.9%	22	5.6%
4	43	46.7%	80	51.3%	83	57.6%	206	52.6%
Not Applicable	38	41.3%	51	32.7%	43	29.9%	132	33.7%
Not Recorded	0	0.0%	1	0.6%	0	0.0%	1	0.3%
Total No of Pts	**92**		**156**		**144**		**392**	

* WHO tumour grade classification scale:

1 Tumours with low proliferative potential, a frequently discreet nature and a possibility of cure following surgical resection alone
2 Generally infiltrating tumours low in mitotic activity, but with a potential to recur
3 Histological evidence of malignancy, generally in the form of mitotic activity, clearly expressed infiltrative capabilities and anaplasia
4 Mitotically active, necrosis prone neoplasms, generally associated with a rapid pre- and post-operative evolution of the disease

Figure 2 below shows the Scottish Index of Multiple Deprivation (SIMD) 2023 quintiles for patients diagnosed with brain and CNS cancer. Almost half of cases occur in the two least deprived areas (45.9%) and less than a third in the two most deprived postcodes (31.9%).

Figure 2: Proportion of brain and CNS cancer diagnosed patients in Scotland by Deprivation Category, 2023



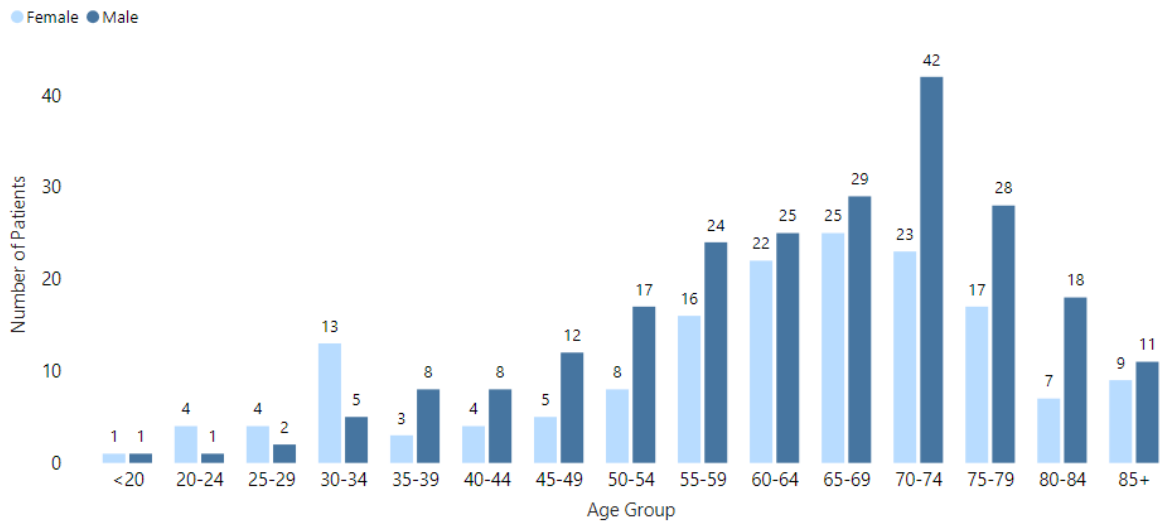
* SIMD Deprivation Category: 1 - most deprived postcodes and 5 - least deprived postcodes

Incidence and Survival

Brain and CNS tumours (malignant and non-malignant) are relatively rare cancers, with the percentage frequency in Scotland being comparatively low at 1.3% of all cancers diagnosed in 2021. It was ranked as the 18th most commonly diagnosed cancer in females and the 15th most commonly diagnosed cancer in males in Scotland in 2021.[3]

The incidence of brain and CNS cancers has increased in males, by 8% and females, by 3%, since 2019. Overall, there has been an increase in incidence of 3% and 1%, respectively for brain and CNS cancers.[3] Figure 3 below shows the number of newly diagnosed brain and CNS cancer patients by age and sex.

Figure 3: Number of patients diagnosed with Brain/CNS cancer in Scotland by age group and sex



The number of death registrations in 2021 for brain and CNS cancers was 370 a rate of 6.6%.[4] Improving survival forms an integral part of the National Cancer Quality Programme. Brain/CNS cancer survival analysis will be reported and analysed on a 3 yearly basis by Public Health Scotland (PHS).[5]

Methodology

The main report discusses the Brain/CNS Cancer QPIs 2023 clinical audit data in more detail with analysis of individual QPI results. Regional or treatment centre performance against each QPI target and overall national results are illustrated. Results are presented as graphic and tabular format. Missing data is highlighted and any possible effect on the measured outcomes identified.

When the denominator of case numbers for any indicator is between one and four, the percentage calculation is not shown on associated charts or tables. This is to

avoid unjustified variation associated with small numbers and to minimise disclosure risk. Charts or tables impacted by this restricted data are shown with a dash (-). An asterisk (*) is applied to indicate a denominator of zero and to distinguish it from a 0% performance.

Commentary provided by NHS Boards, Regions or MDT/neuro-oncology centre relating to any impacted indicators will be included as a detailed record of the circumstances affecting the outcome and to assist the improvement process. Specific NHS Board, Region or MDT/neuro-oncology centre actions have been identified to address issues highlighted through data analysis.

Results

Analysis of individual Brain and CNS Cancer QPIs are set out in the following sections. Graphs and charts have been provided where this aids interpretation and, where appropriate, numbers are also included to provide context.

Data are presented for each QPI by region of diagnosis or by location of treatment (neuro-oncology centre) as well as the overall national performance. Where possible, three years of data (Years 8-10) data is presented. As described in the methodology section, data with a denominator between one and four is restricted data (-) to minimise disclosure risk and to avoid skewed data caused by the small numbers involved and for a denominator of zero (*) to distinguish this from a 0% performance. Commentary from Boards and Regions are reported as a record of how the issues highlighted in the report will be addressed.

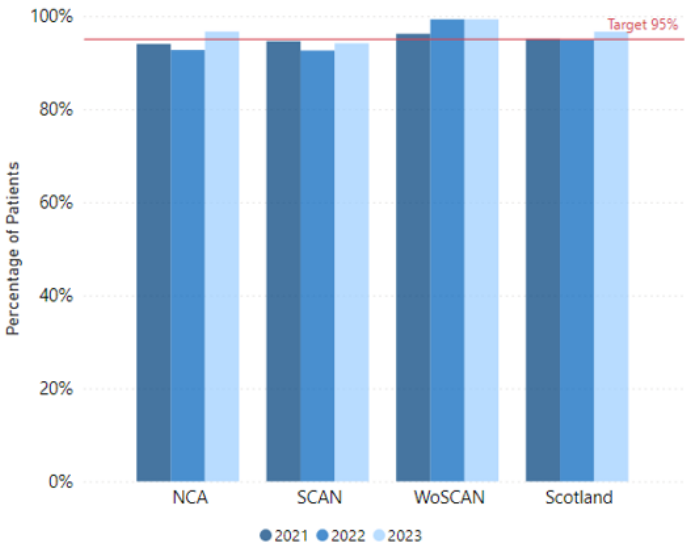
QPI 1: Documentation of Performance Status

Performance status is an important prognostic indicator in brain/CNS cancer patients. It is vital in guiding complex management decisions, including recruitment into clinical trials.[1] An estimated performance status, based on the information available, should be provided when referring patients to the neuro-oncology MDT.[1]

The 95% target of this QPI includes a tolerance level to account for situations where there is insufficient information from the referring site to enable estimation of the WHO performance status.[1]

QPI 1:	Patients with newly diagnosed brain/ CNS cancer should have a WHO performance status documented at time of MDT discussion
Description:	Proportion of newly diagnosed brain/CNS cancer patients who have a documented WHO performance status at the time of MDT discussion
Numerator:	Number of newly diagnosed brain/CNS cancer patients discussed at MDT meeting with a documented WHO performance status at the time of MDT discussion
Denominator:	All newly diagnosed brain/CNS cancer patients discussed at MDT meeting
Exclusions:	None
Target:	95%

Figure 4: Proportion of newly diagnosed brain/CNS cancer patients who have a documented WHO performance status at the time of MDT discussion 2021 – 2023



Region	Year	2021	2022	2023
NCA	N	94	101	87
	D	100	109	90
	%	94.0%	92.7%	96.7%
SCAN	N	123	150	145
	D	130	162	154
	%	94.6%	92.6%	94.2%
WoSCAN	N	150	142	143
	D	156	143	144
	%	96.2%	99.3%	99.3%
Scotland	N	367	393	375
	D	386	414	388
	%	95.1%	94.9%	96.6%

Overall national performance was 96.6% meeting the 95% target. Both NCA (96.7%) and WoSCAN (99.3%) met the 95% performance target. SCAN narrowly missed the target with 94.2%, improving slightly on last year (92.6%). At a board level, NHS Highland missed the target because of one patient and very small numbers skewing the data. NHS Lothian had seven cases with no performance status recorded at MDT and report to continue with previous action plan to address this issue.

MDTs reviewed cases not meeting the QPI and provided feedback:

- Inverness: Review demonstrated appropriate care, but information not shared on referral to MDT led to documentation issue.
- Edinburgh: All cases have been reviewed and did not have KPS recorded at the time of 1st Multi-disciplinary Meeting (MDM) discussion. Action: SCAN will continue to retain a rota for a nominated person to chair the MDT each week and work to improve consistency in documenting KPS at the time of MDM.

Action Required: Continue communications with referrers and MDT chairs to ensure awareness of the requirement to provide and record this data on referral and at MDT, respectively

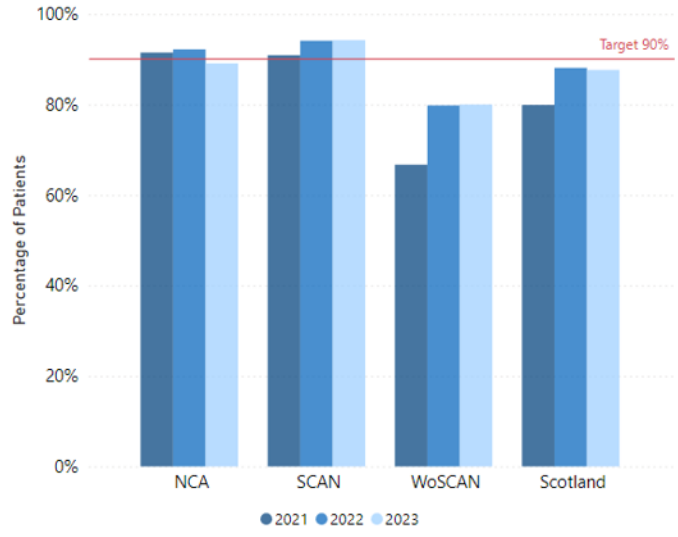
QPI 2: Multi-disciplinary Team Meeting (MDT)

Evidence suggests that patients with cancer managed by an MDT have a better outcome and an increased overall satisfaction with care.[1]

Discussion prior to definitive management decisions provides reassurance that patients are being managed appropriately. In the majority of cases, brain/CNS cancer patients will undergo surgery (biopsy or resection) as their initial intervention prior to any treatment. The measurement of this QPI therefore focuses on discussion of patients at this initial point within the clinical pathway.[1]

QPI 2:	Patients with Brain/CNS cancer should be discussed by a multidisciplinary (MDT) team prior to any surgical procedure
Description:	Proportion of patients with Brain/CNS cancer who are discussed at MDT meeting before surgery
Numerator:	Number of patients with Brain/CNS cancer discussed at MDT before surgery
Denominator:	All patients with Brain/CNS cancer undergoing surgery
Exclusions:	Patients who died before first treatment
Target:	90%

Figure 5: Proportion of Brain/CNS cancer patients who are discussed at MDT meeting before surgery, 2021 – 2023



Region	Year	2021	2022	2023
NCA	N	54	59	49
	D	59	64	55
	%	91.5%	92.2%	89.1%
SCAN	N	80	96	98
	D	88	102	104
	%	90.9%	94.1%	94.2%
WoSCAN	N	84	83	80
	D	126	104	100
	%	66.7%	79.8%	80.0%
Scotland	N	218	238	227
	D	273	270	259
	%	79.9%	88.1%	87.6%

During a previous QPI formal review, the target was reduced (for 2020 cohort onwards) from 95% to 90% to account for patients requiring urgent treatment.

National performance for this target was 87.6%, similar to last year. SCAN was the only region to meet the target with 94.2% performance. WoSCAN has continued to fail the target (80%) and NCA performance has deteriorated slightly to drop below target (89.1%).

Dundee and Edinburgh MDTs targets were met and no comment was required. Aberdeen and Glasgow MDTs commented that all patients were urgent or emergencies. The review conducted for their patients failing the QPI was undertaken and comments follow:

- Aberdeen: Five patients not discussed at MDT prior to surgery all came via the on-call service with significant mass effect, this includes patient(s) transferred from other board(s). It was clinically appropriate to avoid delay to surgery.
- Glasgow: Clinical review was undertaken of all 20 patient's failing QPI. Fourteen (70%) – Urgent cases due to either deterioration or significant mass effect. The other six were on urgent list with no clear indication why operation could not be performed after MDT, most likely no access to operating lists for individual surgeons for the period following the MDT's.[a]

  Overall, only six of the reviewed cases were classified as non-urgent, the others all required Urgent/Emergency Management therefore straight to theatre. The structure of the Department enables access to an emergency theatre one day post-on call, but oncology cases compete with other emergency cases and this is not always congruent with discussing a patient's case at an MDT before operative intervention. The structure of the INS theatres is under review, particularly for urgent/non-emergent cases.

Action Required: It is important that specialist centres of treatment have dedicated specialists performing the surgery on brain/CNS cancer patients. The structure for theatre access by urgent/non-emergent cases is under review in Glasgow. We recognise that there will be emergency cases that need immediate intervention prior to MDT. There should be process in place to ensure that these patients are discussed at MDT as soon as possible following surgery.

[a] Of note: Five of these operations were performed by non-oncology surgeons (twelve oncology surgeons & eight non-dedicated oncology surgeons)

QPI 3: Molecular Analysis

Combined loss of 1p/19q in gliomas is associated with a more favourable response to therapy (chemotherapy or radiotherapy) and is associated with considerably better prognosis when compared to tumours with intact 1p/19q. As such, where indicated, 1p/19q analysis should be carried out to help determine treatment and provide information on predicted tumour response to therapy and prognosis.[1]

Determination of MGMT promoter methylation status predicts response to therapy (chemotherapy or concomitant chemoradiotherapy) in glioblastomas and assists in determination of prognosis. As such, where indicated, MGMT promoter methylation analysis should be carried out to help determine treatment and provide information on predicted tumour response to therapy and prognosis.[1]

A 21-day timeframe is associated with this QPI to ensure that the molecular analysis is undertaken and reported before treatment takes place.

QPI 3:	Patients with biopsied or resected gliomas should have molecular analysis performed on the tumour tissue within 21 days of surgery to inform treatment decision making
Description:	Proportion of patients with biopsied or resected gliomas who undergo relevant molecular analysis of tumour tissue within 21 days of surgery. **Please note this QPI measures two distinct elements**: (i) Patients with Grade II or III gliomas who have the tumour tested for combined loss of 1p/19q (ii) Patients with glioblastomas who have the tumour tested for MGMT promoter methylation status
Numerator:	Number of patients with: (i) a Grade II or III glioma undergoing surgery where tissue sample is tested for 1p/19q within 21 days of surgery (ii) glioblastomas undergoing surgery where tissue sample is assessed for MGMT promoter hypermethylation status within 21 days of surgery
Denominator:	All patients with: (i) a Grade II or III glioma undergoing surgery (ii) Glioblastomas undergoing surgery
Exclusions:	None
Target:	90%

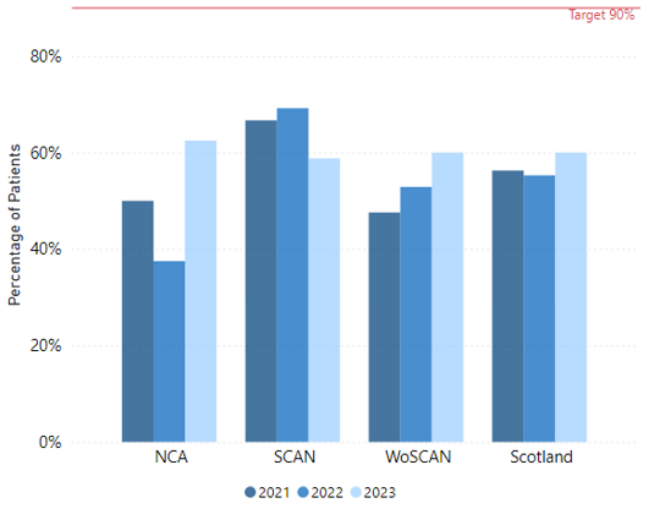
The fifth edition of the WHO classification of Tumours of the Central Nervous System was updated to incorporate technological advances.[6] As reported in the 2021 clinical audit, the molecular analysis QPI was discussed and amended at the third cycle of the Brain/CNS Cancer QPI Formal review.[7] Therefore, this will be the last year of reporting on this QPI.

(i) Molecular Analysis of biopsied or resected gliomas

Dundee was the only cancer centre to achieve the 90% target. Performance in the other centres ranged from 40% in Aberdeen to 60% in Glasgow and 60% nationally.

Boards reviewed cases not meeting the target and combined feedback for QPI 3(i) and QPI3(ii) is listed at the end of this section.

Figure 6: Proportion of patients by Surgical Centre with biopsied or resected gliomas who undergo 1p/19q molecular analysis of tumour tissue within 21 days of surgery, 2021 -2023



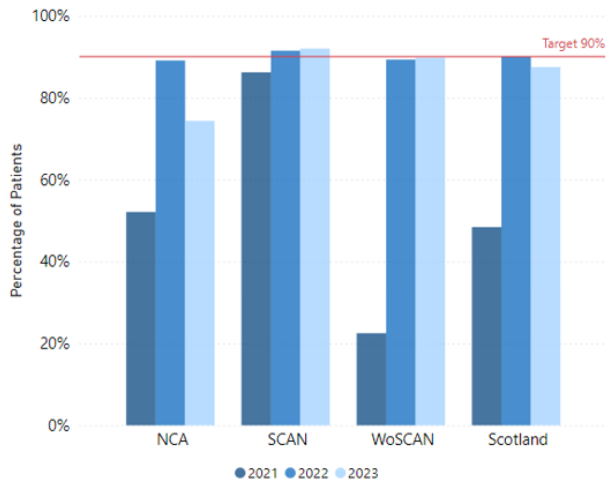
Region	Year	2021	2022	2023
Aberdeen	N	-	2	
	D	-	6	
	%	50.0%	33.3%	40.0%
Dundee	N	-	-	-
	D	-	-	-
	%	50.0%	50.0%	100%
Edinburgh	N	14	9	10
	D	21	13	17
	%	66.7%	69.2%	58.8%
Glasgow	N	10	9	9
	D	21	17	15
	%	47.6%	52.9%	60.0%
Scotland	N	27	21	24
	D	48	38	40
	%	56.3%	55.3%	60.0%

(-) Data is not shown; denominator less than 5
(*) denotes a zero

(ii) Molecular Analysis of glioblastomas for MGMT hypermethylation status

The overall national performance (87.5%) dropped short of meeting the 90%. Dundee and Edinburgh cancer centres exceeded the target with 100% and 92%, respectively. The Glasgow narrowly missed the target with 89.7%) and Aberdeen failed with 64.3%.

Figure 7: Proportion of patients with biopsied or resected gliomas who undergo MGMT promoter hypermethylation status testing within 21 days of surgery 2021 -2023



Region	Year	2021	2022	2023
Aberdeen	N	18	19	18
	D	33	24	28
	%	54.5%	79.2%	64.3%
Dundee	N	7	22	11
	D	15	22	11
	%	46.7%	100%	100%
Edinburgh	N	56	75	69
	D	65	82	75
	%	86.2%	91.5%	92.0%
Glasgow	N	23	67	70
	D	102	75	78
	%	22.5%	89.3%	89.7%
Scotland	N	104	183	168
	D	215	203	192
	%	48.4	90.1	87.5%

Boards reviewed the cases not meeting the target and combined comments for both molecular analysis sections of QPI 3 are shown below:

- Aberdeen: This is an improvement on previous years, but still impacts on treatment planning for oncology management. There is little we can improve on as we are dependent on neuropathology in Lothian for analysis.
- Edinburgh: All cases have been reviewed. Four patients did not have 1p/19q analysis done. Three patients did not have 1p/19q analysis done within 21 days of surgery (23-28 days). Four patients did not have MGMT analysis done within 21 days of surgery. Two patients did not have MGMT analysis performed due to insufficient sample. Following Formal review this QPI has been amended to reflect changes and advances in molecular testing and tumour diagnostics.[4] The changes will be implemented for the 2024 cohort.
- Glasgow: Full review of all patients failing QPI - causative aspects have been exhaustively discussed over the past years. The pathology QPIs have been addressed in the recent update and changed as they are not fit for purpose after update of the WHO classification system in 2022.[4] Pathology QPIs completely revised.

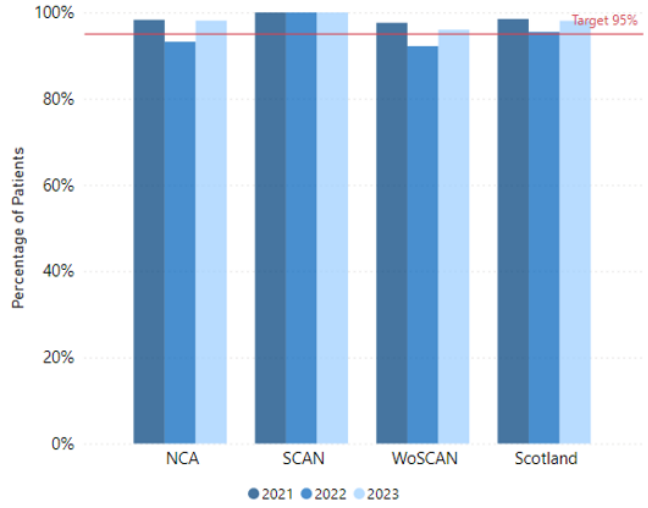
Action Required: The QPI will be replaced as decided during the third cycle of the Brain and Cancer QPI Formal Review which will be outlined in the forthcoming HIS publication.[7]

QPI 4: Neuropathological Diagnosis

Accurate and robust standardisation of tumour diagnosis is required for appropriate patient management. Neuropathologists should report to the standards defined by the Royal College of Pathologists in 'Standards and Datasets for Reporting Cancers: Dataset for Tumours of the Central Nervous System, including Pituitary Gland'.[8]

QPI 4:	All pathology reports for brain/CNS cancer should contain full pathology information (including tumour type as described in WHO Classification of CNS tumours (2016) and WHO grade where appropriate) to inform patient management
Description:	Proportion of patients with brain/CNS cancer where the pathology report contains a full set of data items (as defined by the Royal College of Pathologists)
Numerator:	Number of patients with a histological diagnosis of brain/CNS cancer where histological pathology report contains all data items
Denominator:	All patients with a histological diagnosis of brain/CNS cancer
Exclusions:	None
Target:	95%

Figure 8: Proportion of patients with brain/CNS cancer where the pathology report contains a full set of data items (as defined by the Royal College of Pathologists), 2021 – 2023



Region	Year	2021	2022	2023
NCA	N	58	55	52
	D	59	59	53
	%	98.3%	93.2%	98.1%
SCAN	N	90	102	105
	D	90	102	105
	%	100%	100%	100%
WoSCAN	N	122	95	96
	D	125	103	100
	%	97.6%	92.2%	96.0%
Scotland	N	270	252	253
	D	274	264	258
	%	98.5%	95.5%	98.1%

The performance for the neuropathological diagnosis QPI improved from last year with the target achieved by all three Regions and a national performance of 98.1%. SCAN achieved 100%, NCA 98.1% and WoSCAN 96%. The target has been consistently met nationally over the last few years. Consensus was reached to archive this QPI following the third cycle formal review of brain and CNS cancer QPIs.

All NHS Boards within SCAN reached the target. There was one NHS Board within each of the other two regions that very narrowly missed the target. This was mainly

due to small numbers skewing the data in NHS Highland as one patient didn't have a histological diagnosis. NHS Greater Glasgow and Clyde, four patients missing the target, resulted in a performance of 94.4%. NHS Board comments are shown below:

- Highland: There is no tumour estimate in three dimensions because this was extracted as fragments (from biopsy); agreed that no tumour weight stated.
- Glasgow: The pathology QPIs have been addressed in the recent update and changed as they are not fit for purpose after update of the WHO classification system in 2022.[6] Pathology QPIs completely revised.

Action Required: The 95% target has been consistently met nationally over the last few years. This QPI will be archived in the forthcoming HIS publication.[7]

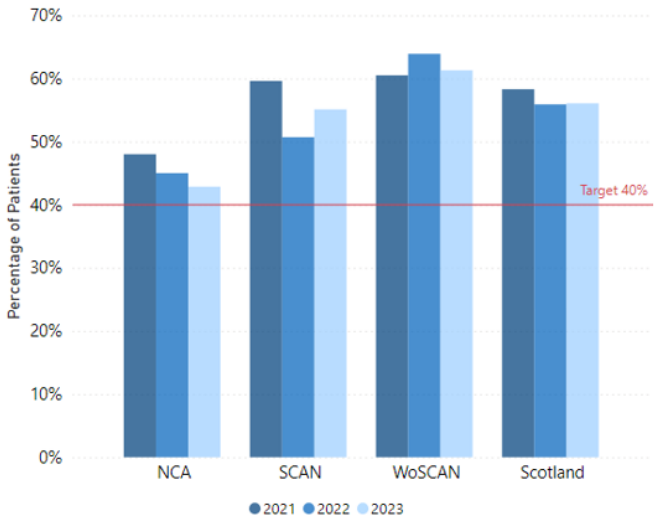
QPI 6: Maximal Surgical Resection

The extent of surgical resection is an independent prognostic factor in Grade III and Grade IV malignant gliomas. Maximal safe surgical resection (≥90%) prolongs time to tumour recurrence and is associated with prolonged survival. Maximum safe surgical resection is recommended by several published guidelines.

Measurement of this QPI will focus on those patients with the intention for maximal safe surgical resection. This will be identified pre-operatively and documented at the MDT.

QPI 6:	Wherever possible patients should undergo maximal surgical resection of malignant gliomas
Description:	Proportion of patients with malignant glioma (with enhancing component on pre-operative imaging) who undergo surgical resection where ≥90% reduction in tumour volume is achieved provided it is considered consistent with safe outcome
Numerator:	Number of patients with resectable malignant glioma (with enhancing component on pre-operative imaging) undergoing surgical resection where ≥90% reduction in tumour volume is achieved
Denominator:	All patients with malignant glioma (with enhancing component on pre-operative imaging) undergoing surgical resection
Exclusions:	Patients undergoing biopsy only
Target:	40%

Figure 9: Proportion of patients with malignant glioma undergoing surgical resection where ≥90% reduction in tumour volume is achieved, 2021 – 2023



Region	Year	2021	2022	2023
Aberdeen	N	5	5	4
	D	15	12	16
	%	33.3%	41.7%	25.0%
Dundee	N	7	4	5
	D	10	8	5
	%	70.0%	50.0%	100%
Edinburgh	N	31	35	27
	D	52	69	49
	%	59.6%	50.7%	55.1%
Glasgow	N	52	46	38
	D	86	72	62
	%	60.5%	63.9%	61.3%
Scotland	N	95	90	74
	D	163	161	132
	%	58.3%	55.9%	56.1%

At the second cycle of the QPI formal review the exclusion ‘patients in whom surgeons’ intent is partial resection / debulking surgery’ was removed. This allows

for benchmarking against the 40% international standard and is easier to define and measure comparably between the 3 regions.

National performance for maximal surgical resection was 56.1% meeting the 40% target comfortably and consistent with previous years. Three of the four MDTs met the target, with performance ranging from 55.1% in Edinburgh, 61.3% in Glasgow and 100% achieved in Dundee. Aberdeen failed the target with only 25% of eligible patients undergoing maximal surgical resection. NHS Board comments provided are shown below:

- Aberdeen: All cases were reviewed and it was felt that 90% resection was not achievable in these cases retrospectively. We will continue to offer maximal resection where safe, perhaps the target of 40% is too ambitious, particularly if we are not measuring morbidity of that intervention.
- Glasgow: Nil action required as QPI passed. Nevertheless, the QPI was looked at and re-worded / updated in recent QPI review to hopefully better and more accurately capture this data.[5] In addition, we have reviewed the records of all the "fails". A number should not have been recorded within the QPI (maximal resection was never the aim), some had >90% resected, but it was very poorly (or not at all) documented, some listed as "not recorded" were clear fails, with <90% resection, but again badly documented. In addition to the review update, we will contact the chairs of MDT to reinforce that we need to get better at recording intent and degree of resection.

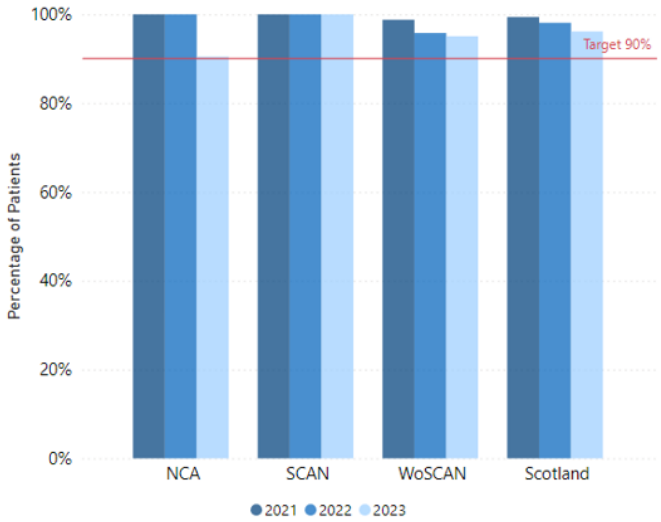
Action Required: In order to aid understanding of any differences between the population served, or the management decisions taken, by the Aberdeen MDT compared with the other MDTs across Scotland, Aberdeen to provide more detail in relation to eligible cases being considered not achievable for maximal surgical resection. Glasgow Centre to improve documentation for this QPI.

QPI 7: Early Post-Operative Imaging

Post-operative imaging is important for a number of reasons; it provides a measurement of surgical performance and helps to determine whether and what type of further treatment is required. It also helps to assess prognosis.[1] Imaging should be carried out within 72 hours to enable reliable assessment of the extent of the resection. MRI is the preferred imaging modality for patients with glioma. After this time, changes in the tumour resection bed confound estimation.[1]

QPI 7:	Patients with malignant glioma (with enhancing component on pre-operative imaging) undergoing surgical resection should be subject to early post-operative imaging
Description:	Proportion of patients with malignant glioma (with enhancing component on pre-operative imaging) who receive early post-operative imaging with MRI within 3 days (72 hours) of surgical resection
Numerator:	Number of patients with malignant glioma (with enhancing component on pre-operative imaging) undergoing surgical resection receiving MRI within 3 days (72 hours) of surgical resection
Denominator:	All patients with malignant glioma (with enhancing component on pre-operative imaging) undergoing surgical resection
Exclusions:	• Patients who are unable to undergo an MRI scan • Patients who refuse an MRI scan • Patients undergoing biopsy only
Target:	90%

Figure 10: Proportion of patients with malignant glioma (with enhancing component on pre-operative imaging) who receive early post-operative imaging with MRI within 3 days (72 hours) of surgical resection, 2021- 2023



Region	Year	2021	2022	2023
Aberdeen	N	15	12	14
	D	15	12	16
	%	100%	100%	87.5%
Dundee	N	9	8	5
	D	9	8	5
	%	100%	100%	100%
Edinburgh	N	52	69	48
	D	52	69	48
	%	100%	100%	100%
Glasgow	N	85	69	58
	D	86	72	61
	%	98.8%	95.8%	95.1%
Scotland	N	161	158	125
	D	162	161	130
	%	99.4%	98.1%	96.2%

National performance for early post-operative imaging was 96.2%, with all regions meeting the 90% target. The Aberdeen centre narrowly missed the target with 87.5% Dundee and Edinburgh achieved 100% and Glasgow had 95.1% performance.

- Aberdeen: Patients missed this target for MRI either due to post-operative complications impacting fitness or suspected metastasis resulting in post-op CT prior to subsequent histology identifying glial tumour and referral for MRI. The latter did not impact treatment planning. We will continue to try to obtain MRI imaging for all suspected glial tumours.
- Glasgow: Passed, no specific action needed. We reviewed the need for this QPI in recent review and felt it important to maintain as there are increasing pressures on MR capacity and there is a need to ensure we maintain compliance with this indicator.

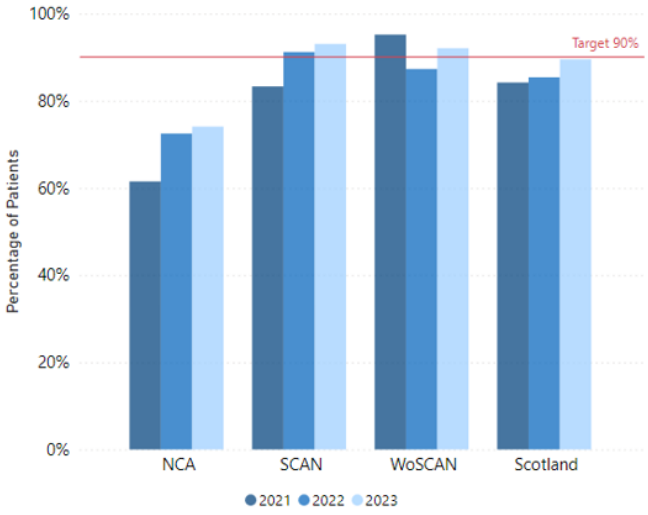
Action Required: None, as the cases which did not meet the target in Aberdeen were due to specific clinical circumstances and appropriate care was provided

QPI 9: Access to Adjuvant Treatment

Evidence demonstrates a negative impact on patient outcome if adjuvant treatment is delayed.[9] In addition, evidence shows that patients commencing radiotherapy within 6 weeks of the date of surgery had improved overall survival. Hence a maximum interval of 6 weeks between surgery and first day of radiotherapy is recommended.[10]

QPI 9:	The maximum time between surgical resection and oncological treatment for patients with high grade glioma (WHO Grades III and IV) should be 6 weeks
Description:	Proportion of patients with high grade glioma (WHO Grade III and IV) undergoing surgical resection who commence their oncological treatment (chemotherapy, radiotherapy or chemoradiotherapy) within 6 weeks of surgical resection
Numerator:	Number of patients with high grade glioma (WHO Grades III and IV) who undergo oncological treatment (chemotherapy, radiotherapy or chemoradiotherapy) who commence oncological treatment within 6 weeks of surgery
Denominator:	All patients with high grade glioma (WHO Grades III and IV) who undergo oncological treatment (chemotherapy, radiotherapy or chemoradiotherapy)
Exclusions:	None
Target:	90%

Figure 11: Proportion of patients with high grade glioma (WHO Grade III and IV) undergoing surgical resection who commence their oncological treatment within 6 weeks of surgery, 2021 – 2023



Region	Year	2021	2022	2023
NCA	N	24	29	20
	D	39	40	27
	%	61.5%	72.5%	74.1%
SCAN	N	50	62	67
	D	60	68	72
	%	83.3%	91.2%	93.1%
WoSCAN	N	80	55	58
	D	84	63	63
	%	95.2%	87.3%	92.1%
Scotland	N	154	146	145
	D	183	171	162
	%	84.2%	85.4%	89.5%

The target for access to adjuvant treatment was reduced to 90%, from the 2020 cohort of patients, to account for patients who are clinically unfit post-operatively for oncological treatment.

National performance was 89.5%, an improvement on last year and narrowly missing the 90% target. SCAN (93.1%) and WoSCAN (92.1%) regions both met the target. NCA, with 74.1%, failed the target. NHS Grampian achieved the target, but small numbers skewing the data and staffing capacity have been factors for NHS Highland

and NHS Tayside. Additionally, NHS Highland have noted patient locality and comorbidities in addition to equipment availability have impacted service, whilst NHS Tayside highlighted pathology issues impacting the timeline. All Boards within SCAN achieved the target. It is noted that NHS Ayrshire & Arran, the only Board in WoSCAN to fail the target was due to data skew caused by small numbers and the case not meeting the target was due to patient factors and pathology issues and there were no delays within the oncology service. Comments from the regions/boards is included below:

- Highland: Patient review indicated post-operative complications creating clinically appropriate delay to surgery, logistical delays due to patient co-morbidities and geographical locations and additionally workforce and equipment capacity issues impacting the timeline.
- Tayside: We have a single-handed practitioner who has no cross cover and so leave will impact service delivery, but mostly delays are due to waiting for events downstream in the pathway, especially pathology results.
- Ayrshire & Arran: One region failing is a statistical irrelevance, we run a regional service. The apparent fail here is a victim of small numbers. No action necessary, QPI passed overall. All fails however were looked at separately and none were related to oncology service issues / capacity, but to patient factors or pathology issues.

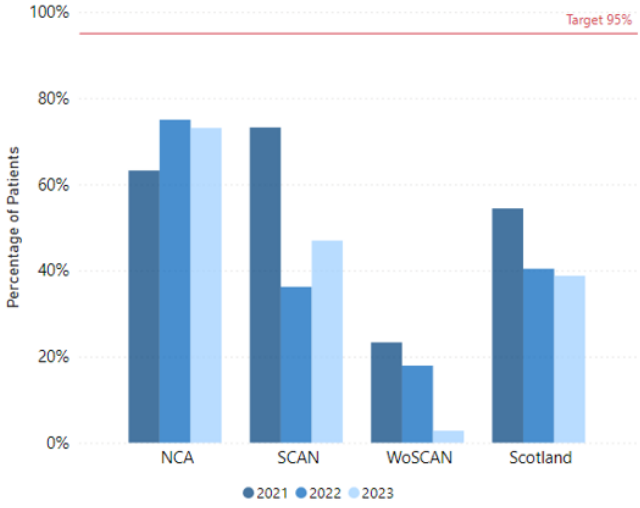
Action Required: We acknowledge the issues the north has experienced around staffing and have noted that NHS Grampian have made strong improvements with data skewed for the region by small numbers in other centres. Pathology issues have been raised as an issue by two separate regions. The network should liaise with relevant networks (Scottish Strategic Network for Genomic Medicine SSNGM) and the Scottish Pathology Network (SPaN)) to support them in addressing the related issues.

QPI 11: Seizure Management

The diagnosis of epilepsy is more accurate when made by a medical practitioner who specialises in epilepsy, resulting in better patient outcomes. Access to a nurse with expertise in epilepsy management enhances quality of life for patients and gives a more patient-centred approach to care.[11]

QPI 11:	Patients with brain/central nervous system (CNS) cancer presenting with seizures at diagnosis should be seen by a neurologist and/or a named epilepsy specialist nurse (ESN)
Description:	Proportion of patients with brain/CNS cancer presenting with seizures at diagnosis who are seen by a neurologist or a named ESN within four weeks of diagnosis
Numerator:	Number of patients presenting with seizures at diagnosis seen by a neurologist or a named ESN within four weeks of diagnosis
Denominator:	All brain/CNS cancer patients presenting with seizures at diagnosis
Exclusions:	None
Target:	95%

Figure 12: Proportion of patients with brain/CNS cancer presenting with seizures at diagnosis who are seen by a neurologist or a nurse with expertise in epilepsy management, 2021 – 2023



Region	Year	2021	2022	2023
NCA	N	12	18	19
	D	19	24	26
	%	63.2%	75.0%	73.1%
SCAN	N	30	17	23
	D	41	47	49
	%	73.2%	36.2%	46.9%
WoSCAN	N	7	5	1
	D	30	28	36
	%	23.3%	17.9%	2.8%
Scotland	N	49	40	43
	D	90	99	111
	%	54.4%	40.4%	38.7%

All Regions failed the 95% target. Performance ranged from 73.1% in NCA, 46.9% in SCAN to 2.8% in WoSCAN. The overall national performance declined further from last year to 38.7%. NHS Highland and Tayside achieved 100% performance. NHS Grampian, with 46.2%, was the only board in NCA to fail the target. All Boards within SCAN and WoSCAN failed (for 26 and 35 patients, respectively). This QPI's time criteria was appraised at the formal review. The four-week target has been persistently challenging for all areas and is not evidence-based. Consensus to amend to a four-month target will be implemented for the 2024 patient cohort.[7]

- Grampian: Seven patients missed this target for various reasons. Two were emergency admissions and died due to medical complications prior to being seen. One patient was seen by neurology, but just after the four-week target. The other four patients were not seen by neurology or Epilepsy Specialist Nurse (ESN), but had no further seizures after appropriate anticonvulsants were started by the neurosurgical team. We have subsequently revised the time scale for this QPI in the recent review.[7] The four-week target remains challenging in a resource stretched environment. We will continue to try to identify these patients at MDT and use the ESN service which we have built links with.
- SCAN: Twenty-six cases were outliers. Eleven patients were seen outwith 28 days of MDM. Fifteen patients were not seen by a neurologist or a named ESN SCAN is having a difficulty maintaining this QPI performance due to limited resources. We recognise the difficulty for patients to get access to the service with prioritising patients with the bigger needs. Following formal review this QPI has been updated and Timeframe within QPI changed from four weeks to four months.[7] It was agreed that four weeks is not a realistic timeframe and more importantly is not appropriate for the patient given the multiple appointments, treatments and wealth of information all being provided during the initial stages of diagnosis.
- WoSCAN: Full review of this QPI done at recent update meeting.[7] Timeframe extended in QPI update as four weeks was not evidence-based, clearly not achievable with current resource, and not felt clinically appropriate.

Action Required: Subject to the third cycle of Formal Review for Brain and CNS cancer QPIs the timeline target for QPI 11 will be amended from four weeks to four months.[7]

QPI 12: Key Worker

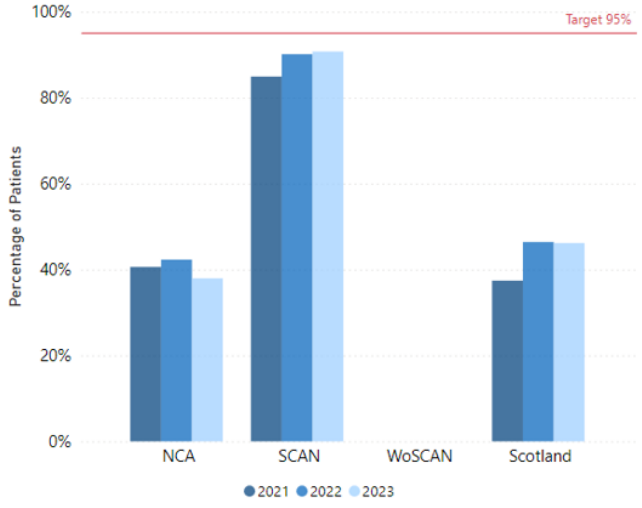
It is recommended that all patients with CNS tumours should have an identified key worker. Having a clearly identified key worker is important to ensure that care is adequately coordinated for patients with CNS tumours. While the patient is being managed under the care of the neuroscience or oncology/radiotherapy centre the key worker is likely to be the Clinical Nurse Specialist (CNS).[1]

Recent quality standard indicates that adults with brain tumours have a named healthcare professional who coordinates their health and social care support.[12] The named healthcare professional could be a key worker and will have expertise in the care of adults with brain tumour. The named healthcare professional is likely to be the clinical nurse specialist or allied healthcare professional most closely involved with a person's care.[12]

Supportive care patients have been excluded from this QPI as they are managed separately through a palliative care route.

QPI 12:	Patients with brain/CNS cancer should have an identified key worker to co-ordinate care across the patient pathway
Description:	Proportion of patients with brain/CNS cancer who have an identified key worker by the first MDT meeting
Numerator:	Number of patients with brain/CNS cancer who have an identified key worker by the first MDT meeting
Denominator:	All patients with brain/CNS cancer
Exclusions:	Patients undergoing supportive care
Target:	95%

Figure 13: Proportion of patients with brain/CNS cancer who have an identified key worker by the first MDT meeting, 2021 – 2023



Region	Year	2021	2022	2023
NCA	N	26	30	22
	D	64	71	58
	%	40.6%	42.3%	37.9%
SCAN	N	79	100	98
	D	93	111	108
	%	84.9%	90.1%	90.7%
WoSCAN	N	0	0	0
	D	124	98	94
	%	0%	0%	0%
Scotland	N	105	130	120
	D	281	280	260
	%	37.4%	46.4%	46.2%

The key worker target continued to be failed nationally (46.2%) and at a regional level to varying degrees. WoSCAN (0%) had no patients with a key worker assigned, NCA had 37.9% performance (NHS Orkney, with one patient, was the only Board in the north to achieve the target) and SCAN was closest to reaching the target (90.7%) with NHS Borders and NHS Dumfries and Galloway both with 100% performance, NHS Fife and NHS Forth Valley reaching over 90% and NHS Lothian at 88.2%.

Regions/Boards reviewed the cases and provided comments, listed below, similar to comments provided for the 2022 cohort audit, highlighting documentation and timing of documentation challenges. The decision to archive this QPI was taken during the third cycle of Brain/CNS cancer QPI Formal Review as it was not acting as a driver for improvement in care.

- Grampian: Six cases missed this target. Reasons included urgent admission(s) and death due to complications following surgery, delayed CNS Nurse involvement (upon pathology diagnosis) and CNS nurse involvement not stated at the first MDT. The majority were delayed access due to presentation imaging being potentially not neuro-oncological. We will continue to try to state key worker at first MDT, sometimes though this is difficult to do if the imaging has multiple differentials.
- Highland: All patients - we have requested that this is entered as Neuro-Onc Therapeutic Radiographer for all Highland patients as the Highland patients are covered as a team and not by an individual keyworker. The MDT admin staff has changed multiple times over the past year, so this has been forgotten.
- Tayside: Need resources to fund a Neurosurgical specialist nurse to fulfil this role
- SCAN: All cases have been reviewed. Omissions with regard to recording Key worker status were recognised, but patients were seen in timely/appropriate manner. Following formal review this QPI has been archived.[5] It was agreed at the formal review meeting that the key worker can change over time and measuring the quality of co-ordinated care throughout the pathway is better assessed using a qualitative approach.
- WoSCAN: Full review of this QPI done at recent update meeting. QPI 12 dropped due to an inability to identify what is meant as a key worker for a tertiary referral service like this.[7]

Action Required: Subject to the third cycle of Formal Review for Brain and CNS cancer QPIs QPI 12 Key Worker will be archived

QPI 13: 30 Day Mortality after Treatment for Brain/CNS Cancer

Treatment related mortality is a marker of the quality and safety of the whole service provided by the MDT.[1] Outcomes of treatment, including treatment related morbidity and mortality should be regularly assessed.

Treatment should only be undertaken in individuals that may benefit from that treatment. This QPI is intended to ensure that treatment is given appropriately, and the outcome reported on and reviewed.

Please note that 30 Day Mortality following Systemic Anti-Cancer Therapy (SACT) is measured and reported separately by PHS.

QPI 13:	30 day mortality following treatment for brain/CNS cancer
Description:	Proportion of patients with brain/CNS cancer who die within 30 days of treatment (surgery, radiotherapy and chemotherapy) for brain/CNS cancer. **Please note this QPI measures two distinct elements**
Numerator:	Number of patients with brain/CNS cancer who undergo treatment that die within 30 days of treatment
Denominator:	All patients with brain/CNS cancer who undergo treatment. (i) Surgery (ii) Radiotherapy (iii) Chemoradiotherapy
Exclusions:	None
Target:	<5%

(i) 30 Day Mortality after Surgery for Brain/CNS Cancer

Table 4: Proportion of patients with brain/CNS cancer who die within 30 days of surgery, 2021 – 2023

Region	Aberdeen			Dundee			Edinburgh			Glasgow			Scotland		
Year	N	D	%	N	D	%	N	D	%	N	D	%	N	D	%
2023	2	34	5.9%	1	22	4.5%	4	105	3.8%	4	101	4.0%	11	262	4.2%
2022	3	62	4.8%	0	26	0%	1	102	1.0%	3	107	2.8%	7	271	2.6%
2021	2	41	4.9%	1	17	5.9%	8	89	9.0%	3	131	2.3%	14	278	5.0%

Nationally, the surgical 30 day mortality target was met (4.2%). There was a decline on the previous year's performance (2.6%), but this is likely due to natural fluctuations in data. Of the four surgical units only Aberdeen failed to reach the target (5.9%). Centre feedback following review of cases is shown below:

- Aberdeen: Cases reviewed; both borderline cases for surgery, but previously well with reasonable Performance Status (PS). Following surgery no significant neurological complications, but post-op complications/co-morbidities arose resulting in not being fit for further oncology management.
- Edinburgh: Four patients died within 30 days after surgery. All patients have been reviewed. Two patients died from disease progression with no surgical complications. In both cases it was reasonable to offer biopsy. Two patients died from perioperative haemorrhage as a surgical complication. The literature states that the risk of death from surgery is between 1-2%. The patients have been reviewed and this can inform our decision making in the future.
- Glasgow: Passed, no specific action required. All four cases reviewed however - majority died of rapidly progressing disease, minority of comorbidities. All four agreed for best supportive care after biopsy ruled out treatable pathology. So, no indicator of any surgical issues.

No Action Required: All centres should continue to review their case selection

(ii) 30 Day Mortality after Radiotherapy for Brain/CNS Cancer

Table 5: Proportion of patients with brain/CNS cancer who die within 30 days of radiotherapy, 2021 – 2023

Region	NCA			SCAN			WoSCAN			Scotland		
Year	N	D	%	N	D	%	N	D	%	N	D	%
2023	1	17	5.9%	3	54	5.6%	0	19	0%	4	90	4.4%
2022	1	9	11.1%	2	56	3.6%	0	33	0%	3	98	3.1%
2021	1	13	7.7%	6	42	14.3%	1	27	3.7%	8	82	9.8%

Nationally, the radiotherapy 30 day mortality target was achieved (4.4%). Regionally, WoSCAN achieved the target with zero patient deaths (0%), whereas NCA (5.9%) and SCAN (5.6%) failed the target, with one and three patient deaths, respectively.

- NCA: Single mortality reviewed. Completed treatment without complications, but rapidly declined neurologically and from chest perspective.
- SCAN: Three patients died within 30 days of radiotherapy and died of disease progression or co-morbidity. All patients have been reviewed and there are no concerns with the offered treatment.

No Action Required: All centres should continue to review their case selection

(iii) 30 Day Mortality after Chemoradiotherapy for Brain/CNS Cancer

Table 6: Proportion of patients with brain/CNS cancer who die within 30 days of chemoradiotherapy, 2021 – 2023

Region	NCA			SCAN			WoSCAN			Scotland		
Year	N	D	%	N	D	%	N	D	%	N	D	%
2023	3	23	13.0%	0	31	0%	1	49	2.0%	4	103	3.9%
2022	2	34	5.9%	0	37	0%	1	45	2.2%	3	116	2.6%
2021	1	26	3.8%	1	39	2.6%	4	69	5.8%	6	134	4.5%

Nationally, the chemoradiotherapy target was met (3.9%). SCAN and WoSCAN met the target with zero (0%) and one (2%) mortality, respectively. NCA failed the target (13%) with three patient deaths across the three centres. Feedback from the review of patient deaths is shown below:

- NCA: Case review identified tumour-related deaths with possible disease progression, with no clear signs of treatment complications. Mortality discussed by Neuro-Oncology MDT.
- WoSCAN: QPI passed, but commented that the solitary death was an unavoidable disease-related death.

No Action Required: We note that in the north the data is highly skewed due to small numbers skewing the data

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Appendix 1: Meta Data

Report Title	Cancer Audit Report: Brain and Central Nervous System Cancers Quality Performance Indicators
Time Period	Patients diagnosed between 01 January 2023 to 31 December 2023
Data Source	Cancer Audit Support Environment (eCASE). A secure centralised web-based database which holds cancer audit information in Scotland.
Data Extraction Date	The data contained within this report was extracted from eCASE on 15/05/2024.
Methodology	Analysis was performed centrally by NSS Information Management Service. The timescales agreed considered the patient pathway to ensure that a complete treatment record was available for the majority of patients. Initial results were provided to Health Boards to check for inaccuracies, inconsistencies or obvious gaps and a subsequent download taken upon which final analysis was carried out. The final data analysis was disseminated for NHS Board & Region verification in line with the regional audit governance process to ensure that the data was an accurate representation of service in each area.
Data Quality	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 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 regions.

	NCA	SCAN	WoSCAN	Scotland
Cases from audit	92	156	144	392
Cases from PHS (2016-2020)*	119	139	164	422
Case ascertainment	77.3%	112.2%	87.8%	92.9%

* Extracted from ACaDMe on 17/02/2022 for NCA & WoSCAN and on 11/04/22 for SCAN using ICD-10 morphology report (Age 15+ at diagnosis)