North, South East and West of Scotland Cancer Networks

HepatoPancreatoBiliary Cancers National Managed Clinical Network

Audit Report

Report of the 2012 Clinical Audit Data

Mr Colin J McKay
Consultant Surgeon
NMCN Clinical Lead

Lindsay Campbell
NMCN Manager

Sandie Ker
Information Officer
West of Scotland Cancer Network

CONTENTS

Executive Summary

Introduction

The purpose of this report is to present an assessment of performance of HepatoPancreatoBiliary (HPB) Cancer Services relating to patients diagnosed across Scotland during 2012 through clinical audit data. This disease group does not have NHS Quality Improvement Scotland (QIS) Clinical Standards to report against and the current set of analyses criteria were determined through consultation with key clinical and clinical effectiveness staff throughout the National Managed Clinical Network (NMCN).

The National Cancer Quality Steering Group (NCQSG), under the auspices of the Scottish Cancer Taskforce, is currently taking forward the development of national Quality Performance Indicators (QPIs) for all cancers which will continue to drive improvement in the quality of patient care. As part of this programme, the development of national QPIs for HPB cancers is now complete with QPIs published on the Healthcare Improvement Scotland (HIS) website[1]. The dataset to support the monitoring and reporting of QPIs was implemented on 1st January 2013 and is available on the Information Services Division (ISD) website[2]. Reporting of cancer audit data for patients diagnosed from 1st January 2013 will be against the national agreed clinical QPIs.

Background

HPB cancers are a rare group of cancers. In 2012 the audit identified 1232 patients diagnosed with a new primary cancer of the liver, pancreas, bile ducts, gallbladder or duodenum in Scotland, of which pancreatic cancer is the largest single group, accounting for 653 cases. Survival rates for pancreatic cancer remain poor and it remains the sixth most common cause of death from cancer in Scotland[3]. The incidence of liver cancer is increasing[4] and mortality has significantly increased in both sexes over the past 10 years. Although the percentage frequency of liver cancer remains relatively low at 1.5% of all cancers, it is the ninth most common cause of death from cancer in both males and females[5].

The table below details the five centres carrying out HPB cancer treatment in Scotland. These are considered the centres for specialist treatment, which includes surgery, chemotherapy and radiotherapy. Patients may receive diagnostic and palliative care in their local hospital where appropriate, however the majority of patients are referred to one of the five centres for specialist management. Additionally, the Scottish Liver Transplant Unit, located in the Royal Infirmary of Edinburgh, is responsible for management of all liver transplant cases in Scotland, a treatment which can be indicated for some patients with primary liver cancer.

Centre	Constituent Hospital(s)
Aberdeen	Aberdeen Royal Infirmary (ARI)
Dundee	Ninewells Hospital (NW)
Edinburgh	Royal Infirmary of Edinburgh (RIE - surgery) and Western General Hospital (oncology)
Glasgow	Glasgow Royal Infirmary (GRI - surgery) and Beatson West of Scotland Cancer Centre (oncology)
Inverness	Raigmore Hospital

Methodology

The clinical audit data presented in this report was collected by clinical audit staff in each NHS Board in accordance with an agreed dataset and definitions. The data was entered locally into the electronic Cancer Audit Support Environment (eCASE): a secure centralised web-based database. Data relating to patients diagnosed between 1st January 2012 and 31st December 2012 was downloaded from eCASE on 13th November 2013.

Analysis was performed centrally by the West of Scotland Cancer Network (WoSCAN) Information Team and the timescales agreed took into account the patient pathway to ensure that a complete treatment record was available for each case. Initial results of the analysis were provided to local Boards to check for inaccuracies or obvious gaps before final analysis was carried out. Final results were 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.

Once all NHS Boards had been given the opportunity to verify their data, further analyses were carried out at a regional and national level to provide an overall assessment of the quality of HPB cancer services in Scotland.

Results

Case ascertainment is a method of estimating whether the number of patient records captured through audit reflects the number expected for that cancer and location. Data were submitted by thirteen of the fourteen Scottish NHS Boards as NHS Orkney had no recorded cases. Case ascertainment for patients diagnosed in 2012 is 95.7% across Scotland indicating generally excellent data capture. Overall data quality and completeness has significantly improved over the past 5 years. As HPB services are based around specialist centres, the data are analysed based upon the location of treatment. This can present problems with respect to the data quality where patients have moved between NHS Boards for diagnosis and treatment, especially where the Board of diagnosis and the Board of treatment are not in the same regional area. Continued effort in this area will be required to maintain the level of improvement that has been observed over the preceding five years.

The data are measured against agreed Key Outcome Measures (KOMs) and results are summarised below. Values represent the overall Scotland result expressed as a percentage, and where appropriate the range at NHS Board level (unless otherwise stated) is also detailed. Percentages which are not comparable due to small numbers have not been included in range values and are detailed in footnotes.

1. Proportion of patients discussed at a multidisciplinary team meeting: 93.0% [78.9-100%]

2. Proportion of patients in Scotland with a curative care plan intent:
    a. All HPB cancers: 16.8% [3.7-30.6%]
    b. Pancreatic, duodenal or distal bile duct cancer [regional range]: 16.0% [14.6-18.6%]
    c. Liver, gallbladder or proximal bile duct cancer [regional range]: 18.5% [10.0-30.1%]

3. Proportion of patients in Scotland with pancreatic, duodenal or distal bile duct cancer treated with surgical resection: 10.3% [4.0-21.0%][a]

4. Proportion of patients who died within thirty days of surgical resection:
    a. Pancreatic resection procedures: 1.1% [0.0-3.8%]
    b. Liver resection procedures: 0.0%
5. Proportion of patients who died within ninety days of surgical resection:
    a. Pancreatic resection procedures: 3.4% [0.0-12.5%][b]
    b. Liver resection procedures: 2.6% [0.0-3.2%]

6. Proportion of pancreatic resection patients who receive adjuvant chemotherapy: 46.1% [42.3-50.0%][c]

[a] Range does not show results for Island Boards (NHS Orkney, NHS Shetland and NHS Western Isles) as there were only 4 patients in the denominator (0/4 = 0.0%).
[b] Caution should be given to upper range value as small numbers are involved in the calculation (1/8 = 12.5%).
[c] Range does not show results for patients who had pancreatic resection out with specialist centres as there were only 3 patients in the denominator (2/3 = 66.7%).

Conclusions and Action Required

Analysis of 2012 audit data demonstrates continual improvement from all Boards / Regions against the agreed KOMs. Results presented in this report demonstrate that patients with HPB cancer receive an equitable and consistent standard of care across NHSScotland. Future reporting of HPB cancer audit data will be against nationally agreed QPIs and it should be noted that many of the target levels set may be challenging for Boards.

Improvements have been observed in recent data and these improvements have facilitated availability of meaningful and useful information to the NMCN regarding service performance and quality. Four years worth of comparative data are now available which has assisted the Network in assessing areas for service improvement. While progress is welcomed, it is also recognised that there remains room for further improvement, although it gives an indication of the standard of data collection and sets the scene for accurate reporting against the QPIs in the coming year.

The NMCN will actively take forward national actions identified and NHS Boards are asked to develop local Action/Improvement Plans in response to the findings presented in the report.

Action Required:

NMCN:

- NMCN to initiate work to examine the variation across NHS Regions in apparent curative care plan intent for patients with liver, gallbladder or proximal bile duct cancers.
- NMCN to initiate work to further investigate the variation in surgical resection rates across NHS Boards/ Regions.

NHS Boards/MDTs:

- NHS Tayside should review local audit processes to ensure all patients diagnosed with HPB cancer are captured in clinical audit.
- All MDTs should continue to review their operational processes to ensure that all patients diagnosed with HPB cancer benefit from discussion of their management at an MDT meeting.
- All NHS Boards/MDTs should now include review of 90-day post-operative mortality cases to be discussed at the annual NMCN mortality and mobidity meeting.
- All surgical centres should review protocols for referral to oncology to ensure all suitable patients are considered for chemotherapy, whether in the neo-adjuvant or adjuvant setting.

A summary of actions for each NHS Board has been included within the Action Plan templates in Appendix 1.

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 NMCN 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 National Lead Cancer Clinician.

Additionally, progress will be reported to the Regional Cancer Advisory Groups (RCAGs) annually by NHS Board Territorial Lead Cancer Clinicians and NMCN Clinical Lead, as part of the regional audit governance process to enable RCAGs to review and monitor regional improvement.

1. Introduction

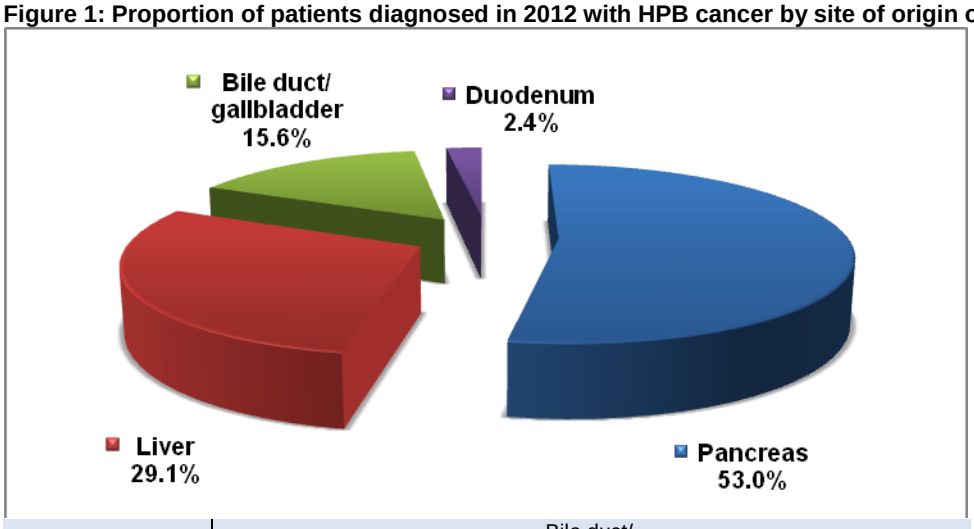
The National Managed Clinical Network (NMCN) for HepatoPancreatoBiliary (HPB) Cancers launched in 2005 with the aim of providing quality and equitable care for all patients in Scotland. The purpose of this report is to present an assessment of performance of HPB Cancer Services relating to patients diagnosed across Scotland during 2012 through clinical audit data. These audit data underpin much of the regional and national development/service improvement work of the NMCN and regular reporting of activity and performance is a fundamental requirement of an MCN to assure the quality of care delivered across the country.

This disease group does not have NHS Quality Improvement Scotland (QIS) Clinical Standards to report against and the current set of analyses criteria were determined through consultation with key clinical and clinical effectiveness staff throughout the NMCN. The National Cancer Quality Steering Group (NCQSG), under the auspices of the Scottish Cancer Taskforce (SCT), is currently taking forward the development of Quality Performance Indicators (QPIs) for all cancers which are intended to drive continuous improvement in the quality of patient care. As part of this programme, the development of national QPIs for HPB cancers is now complete with QPIs published on the Healthcare Improvement Scotland (HIS) website[1]. The dataset to support the monitoring and reporting of QPIs was implemented on 1st January 2013 and is available on the Information Services Division (ISD) website[2]. A national governance and improvement framework is in place to support reporting and progress against the QPIs and this will be overseen by Healthcare Improvement Scotland[1]. Reporting of cancer audit data for patients diagnosed from 1st January 2013 will be against the nationally agreed clinical QPIs.

2. Background

HPB cancers are a rare group of cancers. In 2012 the audit identified 1232 patients diagnosed with a new primary cancer of the liver, pancreas, bile ducts, gallbladder or duodenum in Scotland. Pancreatic cancer accounts for more than half of all HPB cancer diagnoses (53.0%) and Figure 1 illustrates the proportions of each type of HPB cancer diagnosed in Scotland in 2012. The proportion of patients diagnosed with HPB cancer by site of origin has remained largely unchanged over the past four years. However there has been an increase in the proportion of patients diagnosed with liver cancer, from 23.0% in 2009 to 29.1% of the total HPB cancer diagnoses in 2012.

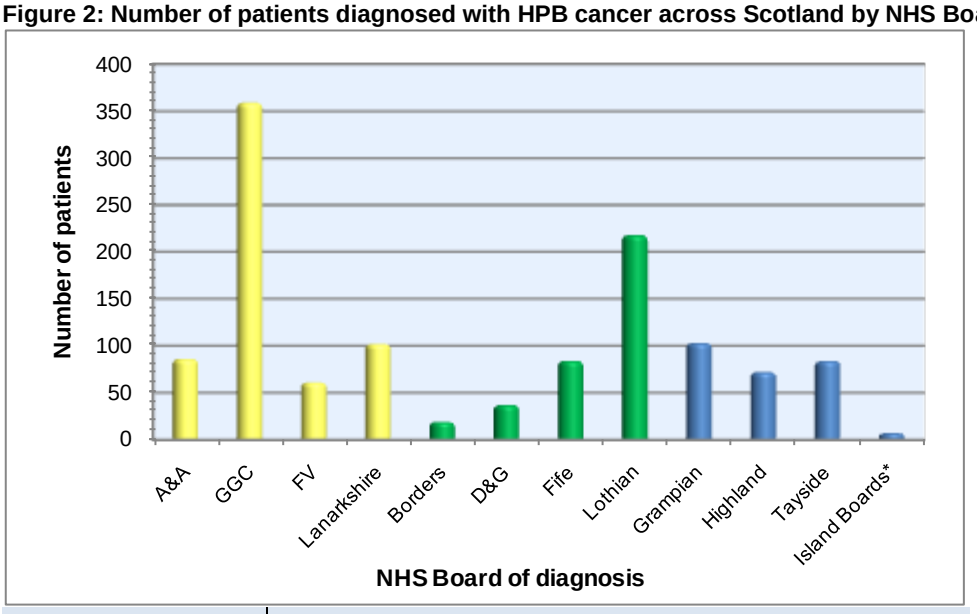
Figure 1: Proportion of patients diagnosed in 2012 with HPB cancer by site of origin of tumour



Site of tumour	Pancreas	Liver	Bile duct/ gallbladder	Duodenum	Total
Number of cases	653	358	192	29	1232

The distribution of the 1232 patients diagnosed in 2012 across the fourteen Scottish NHS Boards is presented in Figure 2. The West of Scotland Cancer Network (WoSCAN) is the most populous area in Scotland and therefore, with 608 patients diagnosed in 2012, is the largest of the three regional Cancer Networks in Scotland. This represents 49.4% of the total number of cases in Scotland. In the South East of Scotland Cancer Network (SCAN) and the North of Scotland Cancer Network (NOSCAN), 358 and 266 patients were diagnosed in 2012 respectively. NHS Greater Glasgow and Clyde diagnosed the greatest number of patients, followed by NHS Lothian. This reflects the population distribution in Scotland where these are the two most populous NHS Boards[6].

Figure 2: Number of patients diagnosed with HPB cancer across Scotland by NHS Board in 2012



WoSCAN – NHS Board	AA	GGC	FV	Lanarkshire	Total
Number of cases	86	359	61	102	608

SCAN – NHS Board	Borders	D&G	Fife	Lothian	Total
Number of cases	19	37	84	218	358

NOSCAN – NHS Board	Grampian	Highland	Tayside	Island Boards[d]	Total
Number of cases	103	72	84	7	266

Table 1 details the five HPB cancer centres in Scotland. These are considered the centres for specialist treatment, which includes surgery, chemotherapy and radiotherapy. Patients may receive diagnostic and palliative care elsewhere, usually in their local hospital, however most patients are referred to one of the five centres for specialist management. Additionally, the Scottish Liver Transplant Unit is located in the Royal Infirmary of Edinburgh where all liver transplant cases in Scotland are referred, this being one of the treatment options in the management of patients with primary liver cancer.

Table 1: Specialist centres for treatment of HPB cancer patients in Scotland

Centre	Constituent Hospital(s)
Aberdeen	Aberdeen Royal Infirmary (ARI)
Dundee	Ninewells Hospital (NW)
Edinburgh	Royal Infirmary of Edinburgh (RIE - surgery) and Western General Hospital (oncology)
Glasgow	Glasgow Royal Infirmary (GRI - surgery) and Beatson West of Scotland Cancer Centre (BWoSCC - oncology)
Inverness	Raigmore Hospital

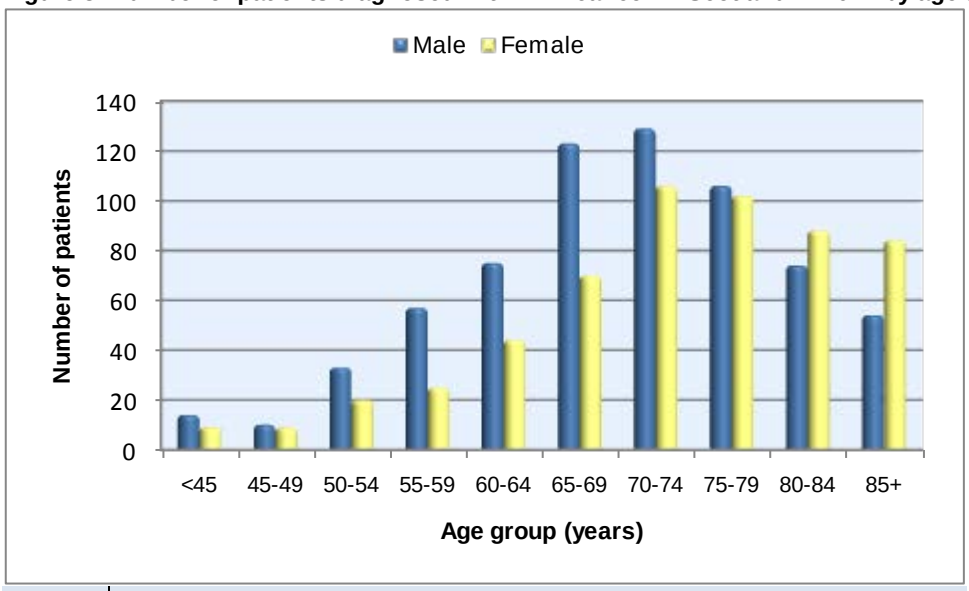
[d] Island NHS Boards include NHS Orkney, NHS Shetland and NHS Western Isles. No patients were diagnosed with HPB cancer within NHS Orkney in 2012.

In Scotland, liver cancer is the thirteenth most common cancer in males and nineteenth in females[4]. The incidence of liver cancer is rising and the last decade has seen the overall incidence of liver cancer increase by 49.0% in Scotland[4]. This rise is particularly reflected in the male population with increases in incidence of 61.5% and 21.0% in males and females respectively in the last decade[4]. The percentage frequency of liver cancer is however relatively low at 1.5% of all cancers types diagnosed[4]. There has been an overall rise in mortality rates for cancer of the liver over the past ten years of 27.8%, showing a statistically significant increase in both males and females[5]. Liver cancer is ranked as the ninth most common cause of death from cancer for both sexes in 2012, and the 10-year percentage change in mortality rates show significant increases of 27.1% and 29.5% for males and females respectively[5].

Pancreatic cancer is the twelfth and eighth most common cancer in males and females respectively[3]. The increase in incidence from 2001 to 2011 is significant in both males and females[5] at 17.5% and 12.6% respectively[3]. Whilst pancreatic cancer is relatively rare (accounting for 2.6% of all cancers[3]), it remains the sixth most common cause of death from cancer in Scotland[3]. Pancreatic cancers tend to present at an advanced stage and are less amenable to treatment and, resultantly, survival is poor. There has been a slight improvement in the 1-year relative (age-standardised) survival in the last twenty years however survival rates remain low at 15.9% in males and 18.8% in females[7]. There has been no recorded improvement in 5-year survival for pancreatic cancer over the past two decades and 5-year relative survival is 4.3% in males and 3.6% in females[7].

HPB cancers occur most frequently later in life. Figure 3 illustrates the number of new cases in 2012 by age and gender. The incidence of HPB cancers is higher in males in all but two age groups. As women live longer than men, the total number of cases diagnosed in women aged 80 years or more is greater than for males. Although the majority of cases do occur in older individuals for both sexes, it is noted that 16.9% of HPB cancers in males were diagnosed in individuals under the age of 60 years. This proportion is largely unchanged since 2011, increasing by less than 1%.

Figure 3: Number of patients diagnosed with HPB cancer in Scotland in 2012 by age and gender



	<45	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Male	14	10	33	57	75	123	129	106	74	54
Female	9	9	20	25	44	70	106	102	88	84

3. Methodology

The clinical audit data presented in this report was collected by clinical audit staff in each NHS Board in accordance with an agreed dataset and definitions. The data was recorded manually and entered locally into the electronic Cancer Audit Support Environment (eCASE): a secure centralised web-based database. Data relating to patients diagnosed between 1st January 2012 and 31st December 2012 was downloaded from eCASE at 2200 hrs on 13th November 2013. Cancer audit is a dynamic process with patient data continually being revised and updated as more information becomes available. This means that apparently comparable reports for the same time period and cancer site may produce slightly different figures if extracted at different times.

Analysis was performed centrally by the WoSCAN Information Team on behalf of the National MCN and the timescales agreed took into account the patient pathway to ensure that a complete treatment record was available for each case. Initial results of the analysis were provided to local 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 verification in line with the regional audit governance process to ensure that the data was an accurate representation of service in each area.

Once all NHS Boards had been given the opportunity to verify their data, further analyses were carried out at a regional and national level to provide an overall assessment of the quality of HPB cancer services in Scotland. These treatment centre-based results were provided to key regional clinicians/ clinical leads for comment ahead of publication.

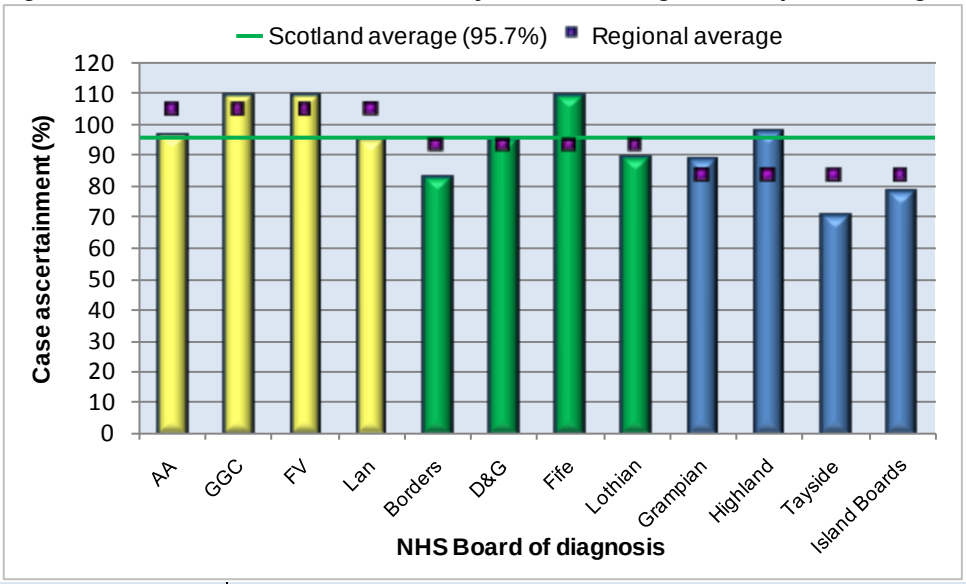
4. Results and Action Required

4.1 Data Quality

Case ascertainment is a method of estimating whether the number of patient records captured through audit reflects the number expected for that cancer and location. It is required to aid the interpretation of analysis based on cancer audit data, as more complete data will return more reliable results. When the NMCN first analysed HPB audit data in 2007, case ascertainment was low in several areas and results were therefore unreliable.

There has been a significant improvement in data collection since 2007; case ascertainment for patients diagnosed in 2012 is 95.7% across Scotland which demonstrates an excellent level of data capture overall. Figure 4 illustrates case ascertainment of over 80% for all but two NHS Boards and it is recognised that small Boards are likely to see yearly fluctuations in numbers, therefore calculated case ascertainment may be an over, or under, estimation and is not necessarily a cause for concern. NHS Tayside has a case ascertainment of 70.0% in 2012 however, and this is low compared to other NHS Boards of a similar size. NHS Tayside have commented on fluctuating levels of audit support and this may have contributed to a lower than expected case ascertainment in 2012.

Figure 4: Estimated case ascertainment by location of diagnosis for patients diagnosed in 2012



	AA	GGC	FV	Lan	Borders	D&G	Fife	Lothian	Grampian	Highland	Tayside	Island Boards
Cases from audit	86	359	61	102	19	37	84	218	103	72	84	7
Cancer Reg. Cases (2007-2011)*	90	329	56	108	23	39	77	246	117	74	120	9
Case ascertainment (%)	95.6	109.1	108.9	94.4	82.6	94.9	109.1	88.6	88.0	97.3	70.0	77.8

As HPB services are based around specialist centres, the data are analysed based upon the location of treatment. This has presented problems in the past with regards to the data quality where patients have moved between NHS Boards for diagnosis and treatment. However, the quality and completeness of treatment information has improved over the past 5 years where there is cross-boundary movement, and continued effort in this area is essential to ensure this level of data quality is maintained going forward.

Action required:

- NHS Tayside should review local audit processes to ensure all patients diagnosed with HPB cancer are captured in clinical audit.

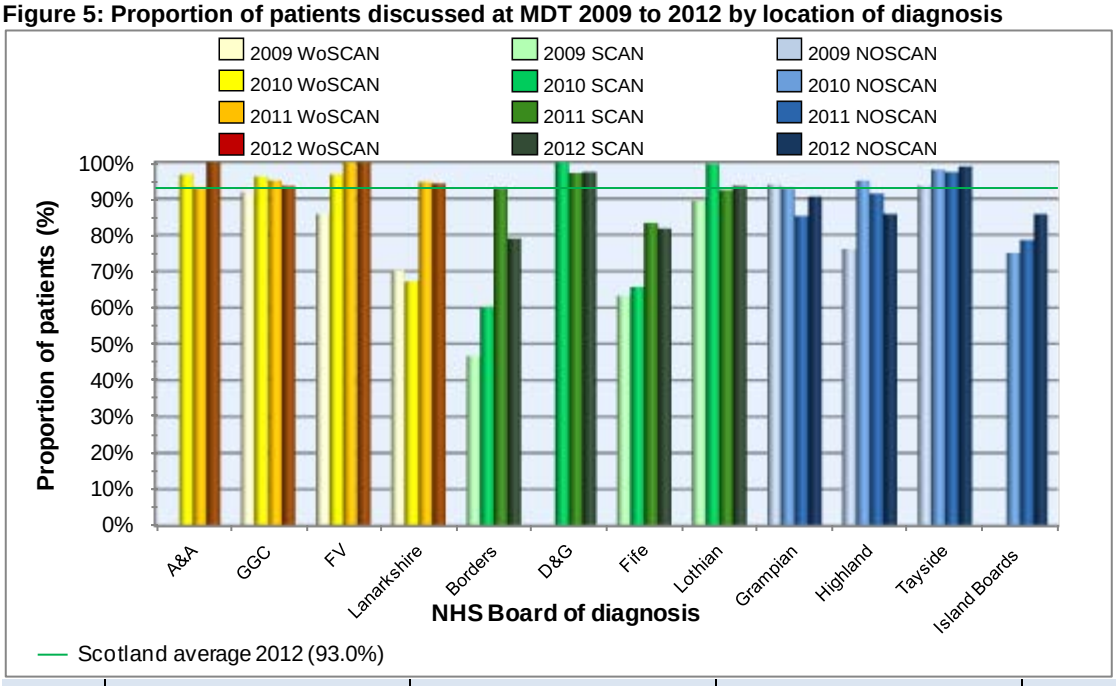
4.2 Performance Against Agreed Quality Measures

4.2.1. Discussed at a Multi-Disciplinary Team Meeting

Multi-disciplinary team (MDT) meetings have frequently been endorsed as a vital method of including all relevant disciplines and professional groups in decisions relating to the clinical management of cancer patients. Effective MDT working is considered integral to provision of high-quality cancer care, ensuring treatment and care provision is tailored to patient needs[8].

The proportion of patients diagnosed in Scotland in 2012 discussed at MDT is 93.0%. Although the overall proportion of patients discussed at MDT is unchanged from 2011, five of the NHS Boards have seen a decrease from 2011 to 2012 figures. It is however encouraging to note that four NHS Boards have achieved over 95.0% which is the proposed QPI target for HPB cancer, published in February 2014. Regionally, only WoSCAN has achieved this target in 2012 with 95.2% discussed at MDT. SCAN and NOSCAN have slight improvements to make to achieve this objective, with 90.3% and 91.8% discussed at MDT respectively.

Figure 5: Proportion of patients discussed at MDT 2009 to 2012 by location of diagnosis



	AA				GGC				FV				Lan			
	2009	2010	2011	2012	2009	2010	2011	2012	2009	2010	2011	2012	2009	2010	2011	2012
N	-	57	79	82	246	240	283	317	48	57	47	59	52	49	49	80
D	-	59	85	82	268	250	298	339	56	59	47	59	74	73	73	85

	Borders				D&G				Fife				Lothian			
	2009	2010	2011	2012	2009	2010	2011	2012	2009	2010	2011	2012	2009	2010	2011	2012
N	7	6	13	15	-	33	32	36	36	42	65	67	133	186	182	200
D	15	10	14	19	-	33	33	37	57	64	78	82	149	187	197	214

	Grampian				Highlands				Tayside				Island Boards			
	2009	2010	2011	2012	2009	2010	2011	2012	2009	2010	2011	2012	2009	2010	2011	2012
N	92	78	81	87	54	57	64	60	72	96	109	81	-	9	11	6
D	98	84	95	96	71	60	70	70	77	98	112	82	-	12	14	7

Numerator (N) = Number of patients discussed at MDT; Denominator (D) = Total number of patients

Action required:

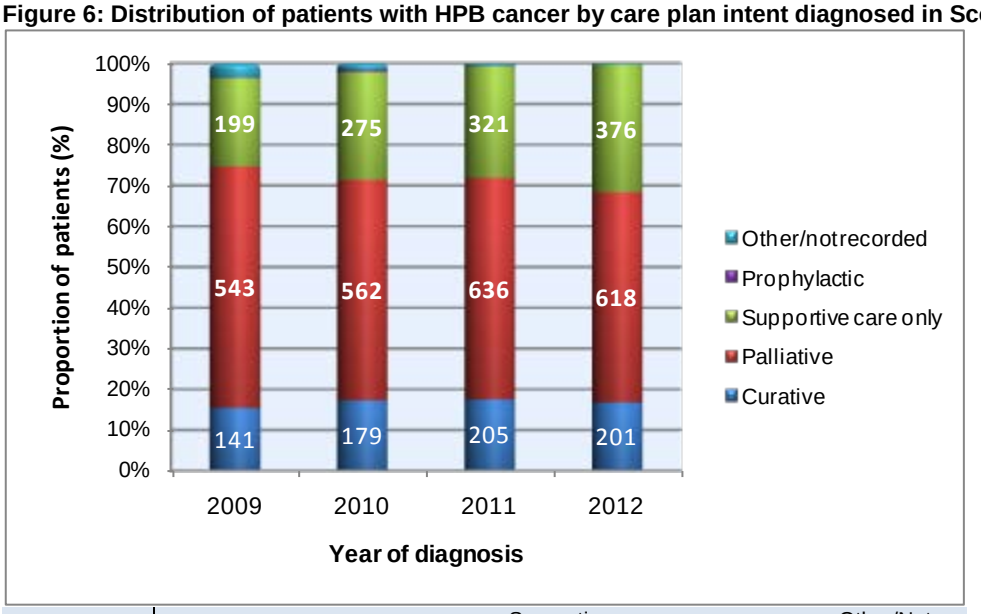
- All MDTs should continue to review their operational processes to ensure that all patients diagnosed with HPB cancer benefit from discussion of their management at an MDT meeting.

4.2.2. Care Plan Intent

At initial discussion by the MDT, a care plan is decided based upon information available at that time. In 2012 over half of all patients diagnosed with HPB cancer across Scotland were considered for a palliative care plan at first discussion (51.5%). A further 31.4% had supportive care only, and only 16.8% of patients were initially considered for potentially curative treatment. Figure 6 indicates that over the last four years from 2009 to 2012, the distribution of care plan intent for all HPB patients across Scotland has not varied greatly from year to year.

Of the patients who are initially considered for curative treatment, a proportion will not actually receive curative treatment following further investigation, often due to the patient having more advanced disease than initially suspected.

Figure 6: Distribution of patients with HPB cancer by care plan intent diagnosed in Scotland between 2009 and 2012



	Curative	Palliative	Supportive Care Only	Prophylactic	Other/Not Recorded
2009	141	543	199	2	32
2010	179	562	275	5	18
2011	205	636	321	1	7
2012	201	618	376	0	4

The proportion of patients going forward for potentially curative treatment is low however this is expected for this tumour group where patients generally present late, at a point where curative treatment is not an option. Earlier diagnosis is desirable but difficult to achieve. By promotion in NHS Boards involving GPs awareness training in the management of unexplained weight loss and persistent vague symptoms, it is anticipated that an impact could be made in expediting the time for patients to reach a diagnosis of an HPB cancer. The Royal College of General Practitioners (RCGP) launched an online training module in 2012 entitled “Pancreatic Cancer: Early Diagnosis in General Practice” which is being promoted by the Scottish Primary Care Cancer Group (SPCCG). Work is also underway to improve referral pathways between primary and secondary care with a view to minimising the time to radiological diagnosis for patients with suspected HPB cancer. Research by the Network has indicated GP access to Computer Tomography (CT) scans would facilitate early detection and this is being piloted through the Scottish Managed Diagnostic Clinical Imaging Network[9].

Although Figure 6 shows a relatively stable picture in the distribution of patients by care plan intent across Scotland since 2009, there does appear to be variation across NHS Boards and Regions, especially when broken down by site of origin of tumour. Figures 7 and 8 show care plan intent by

Region and by site of origin of tumour for patients diagnosed in 2012. Patients diagnosed with malignant neoplasm of the biliary tract unspecified (ICD-10 C24.9), cannot be correctly assigned to either group and have not been included in Figures 7 or 8 (9 patients).

Figure 7: Distribution of care plan intent by region for patients diagnosed with pancreatic, duodenal or distal bile duct cancer in 2012

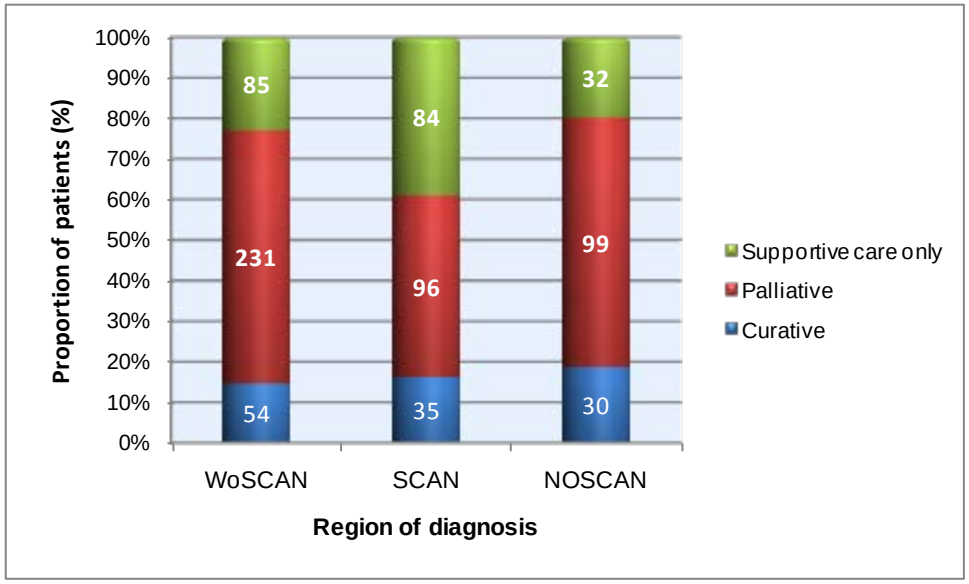


Figure 8: Distribution of care plan intent by region for patients diagnosed with liver, gallbladder or proximal bile duct cancer in 2012

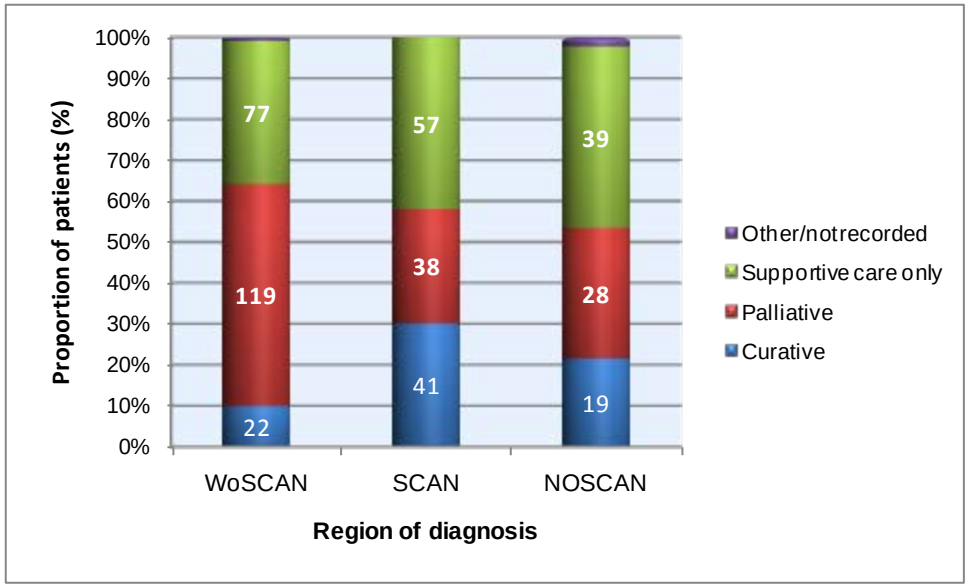


Figure 8 highlights quite a notable difference between the three regions in the proportion of patients with a curative care plan diagnosed with liver, gallbladder or proximal bile duct cancer (10.0% to 30.1%). Reasons for these differences could be related to the age distribution or deprivation categories of each patient cohort. Sixty-five percent (64.9%) of patients diagnosed with liver, gallbladder or proximal bile duct cancer in WoSCAN in 2012 are from Scottish Index of Multiple Deprivation (SIMD) categories 1 and 2 which are the most deprived categories. This compares to only 44.2% of patients in SCAN and could help to explain the variation, as co-morbidities play a significant part in deciding whether or not a patient is suitable for a curative care plan.

Other factors such as disease stage at presentation could also influence treatment plan intent, and further investigation is required to clarify reasons for disparities between regions with any certainty. Future investigation comparing resection rates, rather than care plan intent, may be of more benefit as the care plan intent is often interpreted by audit staff, and may therefore be unreliable. Furthermore, this can change throughout the patient pathway as staging investigations progress.

Action required:

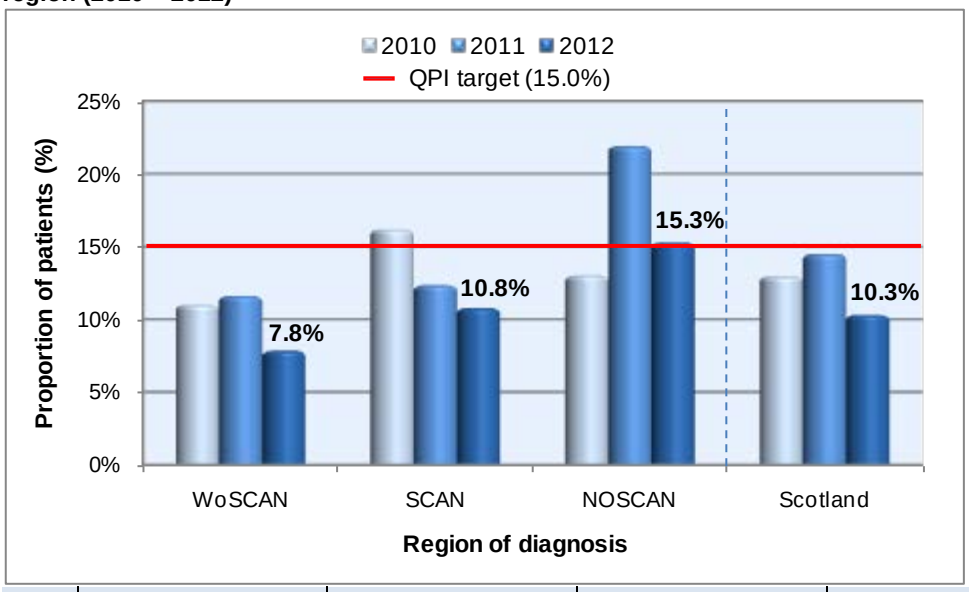
- NMCN to initiate work to examine the variation across NHS Regions in apparent curative care plan intent for patients with liver, gallbladder or proximal bile duct cancers.

4.2.3. Surgical resection – pancreatic, duodenal and distal bile duct cancers

Patients with pancreatic, duodenal or distal bile duct cancers may undergo surgical resection to remove part of the pancreas, duodenum or distal bile duct as anti-cancer treatment. The resection rate is calculated as the proportion of patients who undergo resection from all patients diagnosed with pancreatic, duodenal or distal bile duct cancer.

The surgical resection rate for cancers of the pancreas, duodenum or distal bile duct in Scotland was 10.3% in 2012, with 74 out of 718 patients undergoing a resection procedure for their cancer. This figure is relatively low and, as illustrated in Figure 9, the resection rate has decreased in all three regions since 2011 and variability is evident between the regions. Resection rates across Scotland had previously shown an increasing trend from 2009 to 2011 with rates of 11.7%, 13.0% and 14.5% respectively. The NMCN has already identified as a priority the need to facilitate earlier diagnosis as this may increase access to curative treatment.

Figure 9: Proportion of patients undergoing surgical resection for pancreatic, duodenal or distal bile duct cancer by region (2010 – 2012)



	WoSCAN			SCAN			NOSCAN			Scotland Total		
	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012
N	32	41	28	28	21	22	19	41	24	79	103	74
D	291	353	357	173	170	204	146	187	157	610	710	718

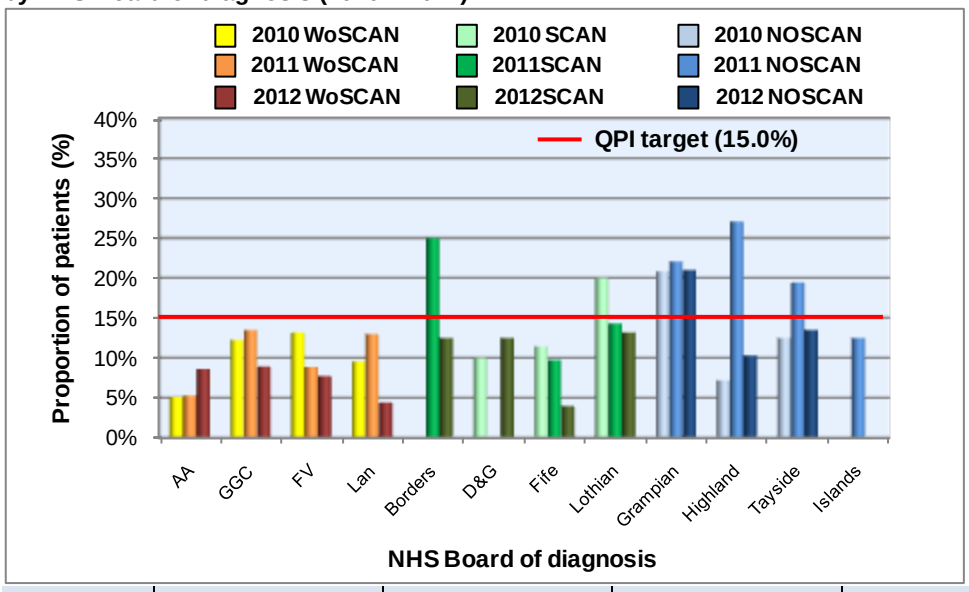
Numerator (N) = Number of patients undergoing surgical resection;
Denominator (D) = Number of patients diagnosed with pancreatic, duodenal or distal bile duct cancer

QPIs which come into effect for patients diagnosed with HPB cancer on or after 1st January 2013 state that 15.0% of patients with pancreatic, duodenal or distal bile duct cancer should undergo surgical resection. The target level takes into account patient choice and patients who may develop

complications during the preoperative phase. It also recognises that the majority of patients will have advanced disease at presentation[1].

Figure 10 shows the breakdown of resection rates by NHS Board from 2010 to 2012 and illustrates the position of individual NHS Boards in relation to this forthcoming target in 2013. Variation is evident across Boards and, as previously mentioned, further investigation into cohort age, deprivation category and disease stage at presentation would be beneficial to ensure equity of patient care across Scotland. Patient pathways for pancreatic cancer are currently being standardised for the West of Scotland NHS Boards.

Figure 10: Proportion of patients undergoing surgical resection for pancreatic, duodenal or distal bile duct cancer by NHS Board of diagnosis (2010 – 2012)



WoSCAN	AA			GGC			FV			Lan		
	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012
N	2	3	5	21	28	17	5	3	3	4	7	3
D	39	57	58	172	208	192	38	34	39	42	54	68

SCAN	Borders			D&G			Fife			Lothian		
	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012
N	0	3	2	2	0	3	4	4	2	22	14	15
D	8	12	16	20	19	24	35	41	50	110	98	114

NOSCAN	Grampian			Highlands			Tayside			Island Boards		
	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012
N	10	13	13	3	13	4	6	14	7	0	1	0
D	48	59	62	42	48	39	48	72	52	8	8	4

Numerator (N) = Number of patients undergoing surgical resection;
Denominator (D) = Number of patients diagnosed with pancreatic, duodenal or distal bile duct cancer

Action required:

- NMCN to initiate work to further investigate the variation in surgical resection rates across NHS Boards/ Regions.

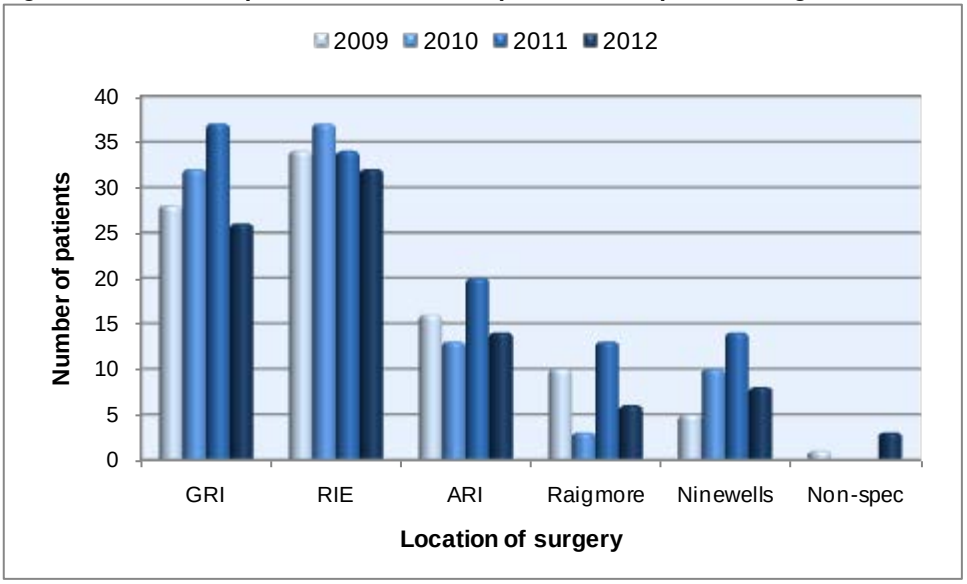
4.2.4. Surgical volumes and thirty-day mortality following resection

There were 39 liver cancer resections for primary cancer carried out on patients diagnosed in 2012 and no deaths occurred within thirty days of surgery. Almost 80% of these liver resections were carried out in the Royal Infirmary of Edinburgh. There were 2 liver resections carried out in Glasgow Royal Infirmary, and the remaining 6 resections were carried out between the three surgical centres in the North of Scotland. Thirty-day mortality following liver resection was also 0% in patients diagnosed in 2009, 2010 and 2011 representing four successive years of excellent outcomes for liver resectional surgery in Scotland. The emphasis here would be to endeavour to improve the proportion of patients diagnosed with liver cancer going forward for treatment with curative intent.

The volume of pancreatic resections per centre for patients diagnosed with HPB cancer is illustrated in Figure 11. There were 89 pancreatic resections carried out in Scotland in 2012 and there is marked variation across the five specialist treatment centres in Scotland. This is to be expected however as there are three specialist centres in NOSCAN providing surgical treatment to approximately one fifth of the total number of patients diagnosed with HPB cancer in 2012.

The QPI relating to surgical volumes, which will come into effect for patients diagnosed on or after 1st January 2013, states that a minimum of 11 resections should be performed per year in each specialist centre[1]. It should be noted that the QPI is not directly comparable to the figures shown in Figure 11 as the QPI will measure resection rates for patients diagnosed with pancreatic cancer only, therefore surgical volume figures will in fact be lower than those reported below, thus highlighting the challenging nature of this target.

Figure 11: Volume of pancreatic resections per centre for patients diagnosed with HPB cancer in 2012



Mortality following resection for HPB cancer has fallen over the past 30 years and in specialist units should be less than 5%[10]. Across Scotland, thirty-day mortality following pancreatic cancer resection was 5.3% in 2009, 0.0% in 2010, 3.4% in 2011 and 1.1% in 2012. Results have therefore been in keeping with the evidence for the last three consecutive years. Figure 12 presents the percentage of patients who died within thirty days of pancreatic resection for patients diagnosed between 2009 and 2012 by location of surgery. Mortality figures are influenced by small numbers and yearly fluctuations, as illustrated in Table 2, and where the proportion of patients who died within thirty days of resectional surgery exceeds 5% for a particular unit in a single year, this is not immediately a cause for concern. Units are expected to review their mortality cases and assess the reasons for post-operative mortality to establish whether any issues need to be addressed locally. All cases should be discussed at the annual NMCN mortality and mobidity meeting.

Figure 12: Proportion of patients who died within 30 days of pancreatic resection by location of surgery

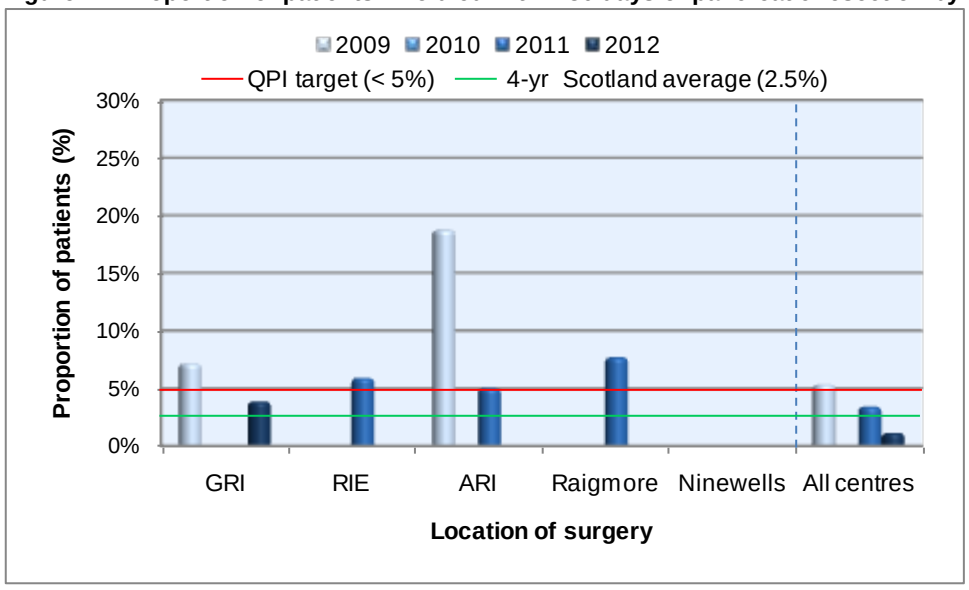
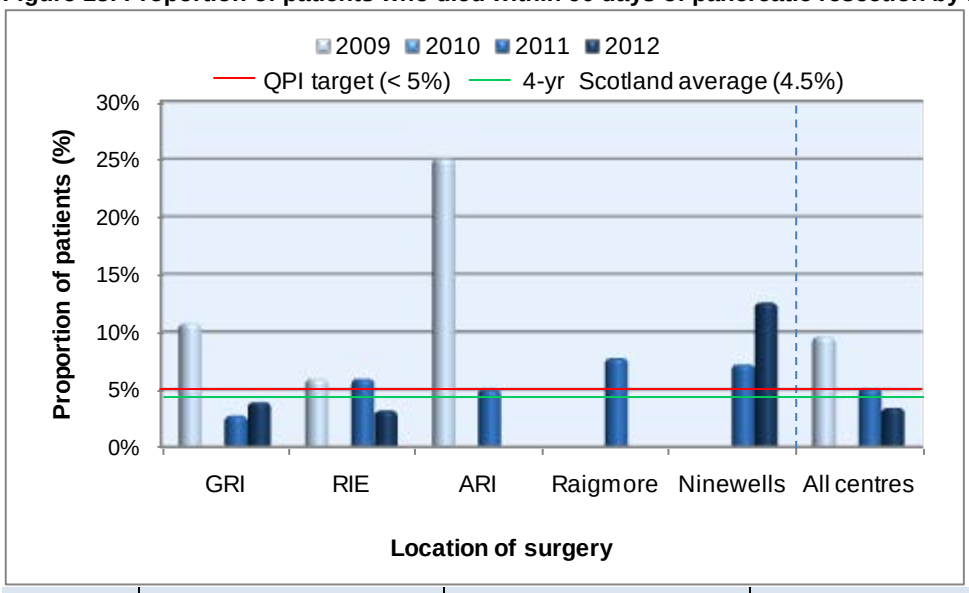


Figure 13: Proportion of patients who died within 90 days of pancreatic resection by location of surgery



	GRI				RIE[e]				ARI[f]				Raigmore			
	2009	2010	2011	2012	2009	2010	2011	2012	2009	2010	2011	2012	2009	2010	2011	2012
N (30-day)	2	0	0	1	0	0	2	0	3	0	1	0	0	0	1	0
N (90-day)	3	0	1	1	2	0	2	1	4	0	1	0	0	0	1	0
D	28	32	37	26	34	37	34	32	16	13	20	14	10	3	13	6

	Ninewells				Non-specialist				Total			
	2009	2010	2011	2012	2009	2010	2011	2012	2009	2010	2011	2012
N (30-day)	0	0	0	0	0	0	0	0	5	1	4	1
N (90-day)	0	0	1	1	0	0	0	0	9	0	6	3
D	5	10	14	8	1	0	0	3	94	96	118	89

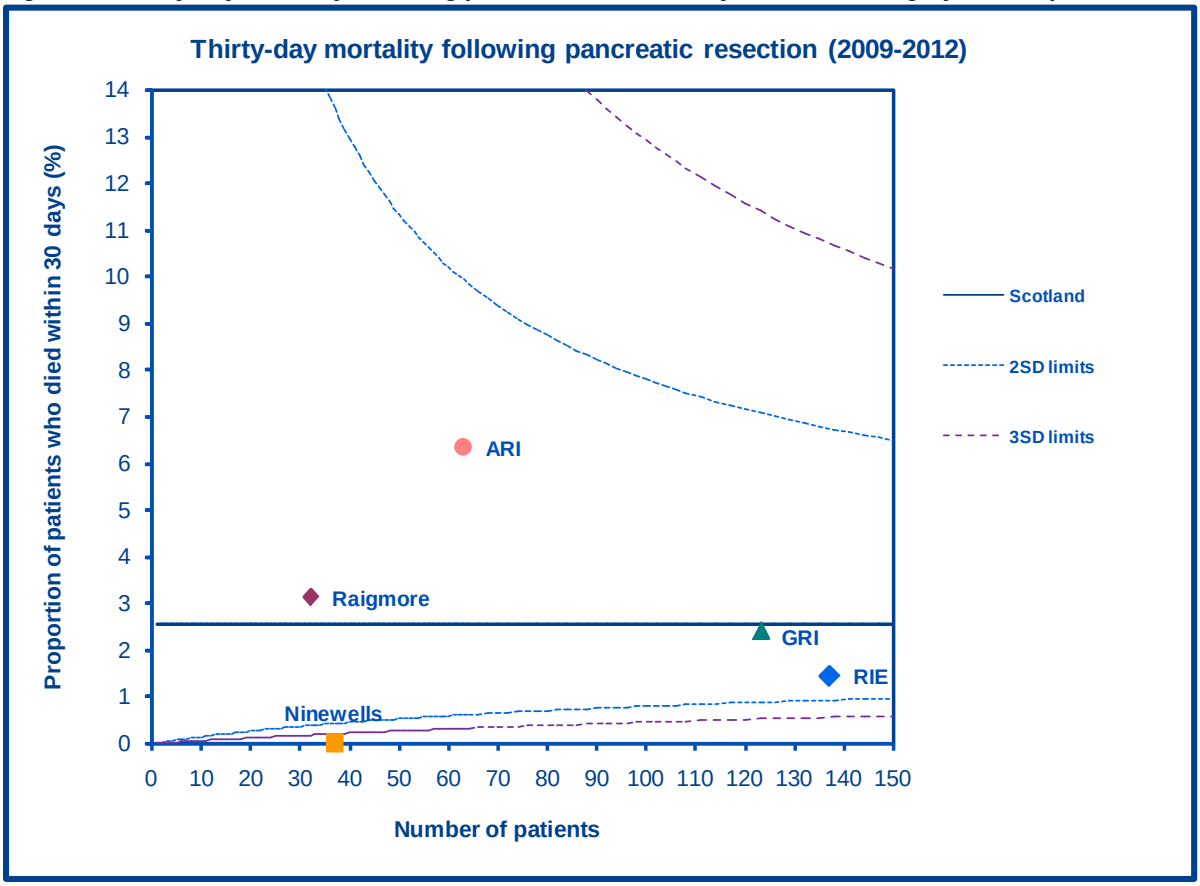
Numerator (N) = Number of deaths within 30/90 days of surgery; Denominator (D) = Number of patients undergoing pancreatic resection

[e] One patient diagnosed in 2011 in NHS Forth Valley who had a pancreatic resection at RIE was incorrectly recorded as having died after surgery. NHS Lothian has confirmed that the patient was alive thirty days post surgery and therefore figures have been corrected from those published in 2011 Audit Report (2/34 = 5.9%).

[f] One operation in ARI in 2010 was incorrectly recorded as a Pylorus Preserving Pancreaticoduodenectomy and should have been recorded as a duodenectomy. This death should not be counted as a death following pancreatic resection and therefore the figures have been corrected based on this new information. Thus the 2010 30-day mortality for ARI is 0.0% and not 7.1% as previously reported.

Aberdeen Royal Infirmary (ARI) has a mortality of 5% or greater for two of the four years from 2009 to 2012; however as small numbers and random variance can have a significant effect on these proportions, data for the four years 2009 to 2012 have been collated to present a broader picture. Figure 14 presents a funnel plot where the number of resections performed between 2009 and 2012 are plotted against the percentage mortality for each surgical centre. The funnel plot is based upon the average result for Scotland and the solid blue horizontal line represents the Scottish average mortality rate (2.5%). The broken lines represent the 95% (2 Standard Deviations) and 99.8% (3 Standard Deviations) control limits. Units that lie below the lower control limits have significantly better thirty-day post-operative mortality rates than the Scottish average.

Figure 14: Thirty-day mortality following pancreatic resection by location of surgery: funnel plot of 2009-2012 data



The data presented in Figure 14 illustrates that Glasgow Royal Infirmary, Royal Infirmary of Edinburgh and Ninewells Hospital fall below the national average mortality rate. Raigmore Hospital sits just above the national average but is still below 5% mortality over the four years therefore this still represents good performance. Across the four year period, Aberdeen Royal Infirmary has a 30-day mortality rate of 6.3% which is above the national average and the 5% guideline level. As the 2009-2012 year mortality falls within the upper control limits in the plot, it is not significantly different from the other centres over the four year period.

The mortality for ARI is notably higher than the other four centres, however overall figures are affected by the high mortality rate in 2009 and improvements are evident over the past three years. It is also noted that ARI mortality rates in 2010, 2011 and 2012 do not increase when comparing 30-day to 90-day mortality rates, as illustrated in Figure 13. Conversely, 90-day mortality rates for Ninewells Hospital are higher in 2011 and 2012 and increase from 0.0% to 7.1%, and 0.0% to 12.5% respectively (as demonsrated in Figure 13). In both cases this represents one death per year within 90 days of surgery and further demonstrates the risk that treatment centres operating on smaller numbers are more susceptible to fluctuations in mortality rates as a result of a small number of

deaths. Surgical mortality is an area covered by the HPB QPIs and therefore 30-day and 90-day mortality will be continually monitored through the QPI National Governance Framework[1].

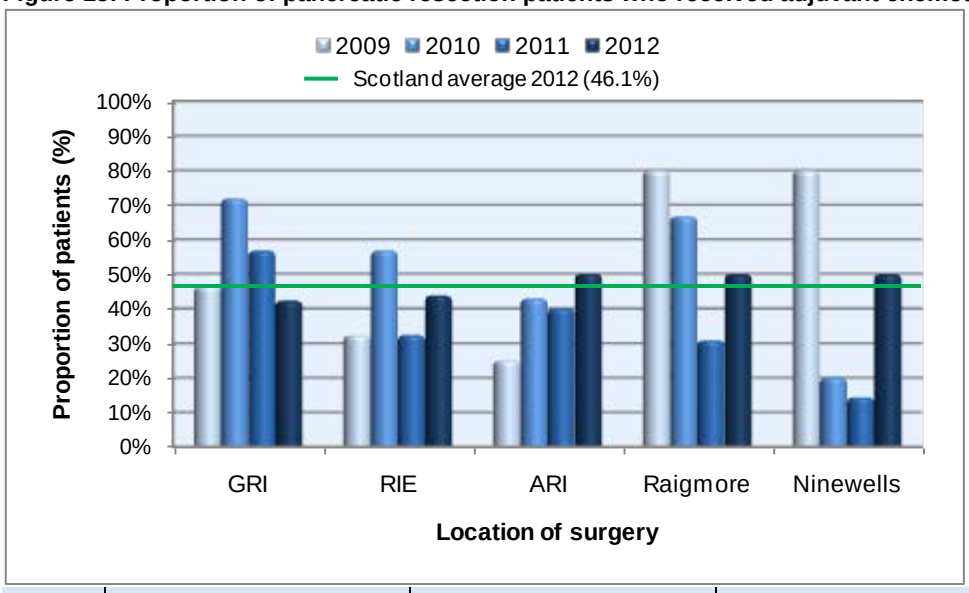
Action required:

- All NHS Boards should now include review of 90-day post-operative mortality cases to be discussed at the annual NMCN mortality and morbidity meeting.

4.2.5. Adjuvant chemotherapy following pancreatic resection

Patients undergoing pancreatic cancer resection should be considered for adjuvant chemotherapy as there is proven survival advantage[11]. This is a topic that has been considered of importance by the HPB QPI development group and is resultantly addressed by a QPI for HPB cancer[1]. Figure 15 illustrates the proportion of pancreatic cancer resection patients who went on to receive adjuvant chemotherapy.

Figure 15: Proportion of pancreatic resection patients who received adjuvant chemotherapy by location of surgery



	GRI				RIE[g]				ARI				Raigmore			
	2009	2010	2011	2012	2009	2010	2011	2012	2009	2010	2011	2012	2009	2010	2011	2012
N	13	23	21	11	10	21	11	14	4	6	8	3	8	2	4	7
D	28	32	37	26	31	37	34	32	16	14	20	6	10	3	13	14

	Ninewells				Non-specialist				All Locations			
	2009	2010	2011	2012	2009	2010	2011	2012	2009	2010	2011	2012
N	4	2	2	4	2	0	0	2	41	54	45	41
D	5	10	14	8	4	0	0	3	94	96	118	89

Numerator (N) = Number having adjuvant chemotherapy; Denominator (D) = Number of patients undergoing pancreatic resection

Proportions receiving adjuvant chemotherapy have fluctuated between 2009 and 2012 in RIE and ARI. Following yearly decreases in Raigmore and Ninewells from 2009 to 2011, both of these centres have seen an increase from 2011 to 2012, with 50.0% of patients diagnosed in 2012 receiving adjuvant chemotherapy in both centres.

GRI has seen yearly decreases from 2010 to 2012 in the proportion of patients receiving adjuvant chemotherapy however a further 19.2% of patients undergoing pancreatic resection in GRI received

[g] One patient diagnosed in NHS Forth Valley in 2011 having a pancreatic resection at RIE did not have data recorded on whether adjuvant chemotherapy was received. NHS Lothian has confirmed that this patient did have adjuvant chemotherapy and therefore RIE figures have been corrected from 29.4% to 32.4% (11/34).

neo-adjuvant chemotherapy as part of multimodality therapy in 2012. There have been numerous studies into different treatment modalities for patients with locally advanced pancreatic cancer (LAPC) and although mostly small and non-randomised, neo-adjuvant therapy is consistently reported to induce resectability in up to 30-40% of LAPC patients[12]. As demonstrated in Figure 9 however, pancreatic resection rates in NHSGGC have decreased since 2011, though this is true for all but two of the NHS Boards and further investigation into the variation in pancreatic resection rates is required to elucidate the role of neo-adjuvant chemotherapy in these patients.

It should be noted that measurability of the QPI on this topic will not be directly comparable to the results in Figure 15, as the QPI will only include patients diagnosed with pancreatic cancer; however this gives a broad indication of where service provision may need to be addressed to achieve the target of 50.0%. The QPI target accounts for patients that may have post-operative complications that preclude consideration of adjuvant therapy and the target will be kept under review and revised as necessary once baseline data or further evidence becomes available[1].

Action required:

- All surgical centres should review protocols for referral to oncology to ensure all suitable patients are considered for chemotherapy, whether in the neo-adjuvant or adjuvant setting.

5. Conclusions

Analysis of 2012 audit data demonstrates continual improvement from all Boards / Regions against the agreed KOMs. Results presented in this report illustrate that patients with HPB cancer receive an equitable and consistent standard of care across NHSScotland. Future reporting of HPB cancer audit data will be against nationally agreed QPIs and it should be noted that many of the target levels set may be challenging for some Boards.

Cancer audit data underpins much of the development and service improvement work of the NMCN and regular reporting of activity and performance is a fundamental requirement of an MCN to assure the quality of care delivered. It has been an aim of the Scottish HepatoPancreatoBiliary Cancer NMCN to improve quality and completeness of clinical audit data to ensure that robust performance assessment can take place. Significant improvements have been observed since data collection commenced in 2007 and these improvements have facilitated availability of meaningful and useful information to the NMCN regarding service performance and quality. Four years worth of comparative data are now available which has assisted the network in assessing areas for service improvement.

While progress is welcomed, it is also recognised that there remains room for further improvement, although it gives an indication of the standard of data collection and sets the scene for accurate reporting against the QPIs in the coming year. It is anticipated that these shortcomings will be addressed by the implementation and reporting of QPIs, which aim to enable continuous improvement and drive service change, where appropriate, by focussing on areas of key clinical importance which make a difference to patient outcome and experience. The QPIs are evidence based, outcome focussed and measurable and were developed by a multidisciplinary group. The dataset aligned to measurement and reporting of the QPIs was implemented on 1st January 2013 for all patients diagnosed on or after this date.

There are a number of actions required as a consequence of this assessment of performance against the agreed criteria. Some of these relate to a continued commitment to data quality improvement. Additional actions relating to service provision were identified particularly in relation to variance in surgical outcomes and access to adjuvant therapy.

The NMCN will actively take forward national 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 1.

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 NMCN 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 National Lead Cancer Clinician.

Additionally, progress will be reported to the Regional Cancer Advisory Groups (RCAGs) annually by NHS Board Territorial Lead Cancer Clinicians and NMCN Clinical Lead, as part of the WoSCAN audit governance process to enable RCAGs to review and monitor regional improvement.

Acknowledgement

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 HPB cancer for their contribution to the clinical audit process.

Abbreviations

AA	NHS Ayrshire & Arran
ARI	Aberdeen Royal Infirmary
BWoSCC	Beatson West of Scotland Cancer Centre
D&G	NHS Dumfries & Galloway
eCASE	Electronic Cancer Audit Support Environment
FV	NHS Forth Valley
GGC	NHS Greater Glasgow and Clyde
GRI	Glasgow Royal Infirmary
ISD	Information Services Division
HIS	Healthcare Improvement Scotland
HPB	HepatoPancreatoBiliary
MCN	Managed Clinical Network
MDT	Multidisciplinary Team
NCQSG	National Cancer Quality Steering Group
NMCN	National Managed Clinical Network
NOSCAN	North of Scotland Cancer Network
NW	Ninewells Hospital
QIS	Quality Improvement Scotland
QPI	Quality Performance Indicator
RCAG	Regional Cancer Advisory Group
RCGP	Royal College of General Practitioners
RIE	Royal Infirmary of Edinburgh
SCAN	South East Scotland Cancer Network
SCT	Scottish Cancer Taskforce
SIMD	Scottish Index of Multiple Deprivation
SLWG	Short life working group
SPCCG	Scottish Primary Care Cancer Group
WoSCAN	West of Scotland Cancer Network

References

1. Healthcare Improvement Scotland. Hepatopancreatobiliary Cancer Quality Performance Indicators. [Accessed on: 11th January 2014]. Available at: http://www.healthcareimprovementscotland.org/programmes/cancer_care_improvement/cancer_resources/cancer_qpis.aspx

2. Information Services Division. Data Definitions for the National Minimum Core Data Set to support the introduction of HPB Quality Performance Indicators v1.1 [Accessed on: 10th January 2014]. Available at: http://www.isdscotland.org/Health-Topics/Cancer/Cancer-Audit/docs/HPB_Cancer_QPI_Dataset_v1_1.pdf?1

3. Information Services Division. Cancer statistics for pancreatic cancer [Accessed on: 10th January 2014]. Available at: http://www.isdscotland.org/Health-Topics/Cancer/Cancer-Statistics/Pancreatic/#summary

4. Information Services Division. Cancer statistics for liver cancer [Accessed on: 10th January 2014]. Available at: http://www.isdscotland.org/Health-Topics/Cancer/Cancer-Statistics/Liver/

5. Information Services Division. Cancer in Scotland, June 2004 (updated November 2013) [Accessed on: 13th January 2014]. Available at: http://www.isdscotland.org/Health-Topics/Cancer/Cancer-Statistics/

6. Scottish Public Health Observatory. Population: estimates by NHS Board. [Accessed on: 13th January 2014]. Available at: http://www.scotpho.org.uk/population-dynamics/population-estimates-and-projections/data/nhs-board-population-estimates

7. ISD, NHS National Services Scotland. Trends in Cancer Survival in Scotland, 1983-2007. August 2010. [Accessed on: 17th January 2014.]. Available at: http://www.isdscotland.org/Health-Topics/Cancer/Cancer-Statistics/Survival_summary_8307.pdf?1

8. NHS Quality Improvement Scotland (2008). Management of Core Cancer Services Standards [online]. [Accessed on: 19th February 2014] Available at: http://www.healthcareimprovementscotland.org/our_work/cancer_care_improvement/cancer_resources/standards_for_cancer_services.aspx

9. SHPBN, HepatoPancreatoBiliary Cancer NMCN 2012-2013 Activity Report. [Accessed on: 3rd February 2014]. Available at: http://www.shpbn.scot.nhs.uk/index.php/about-shpbn

10. De Wilde, RF, Besselink, MG, van der Tweel, I. et al (2012) Impact of Nationwide Centralisation of Pancreaticoduodenectomy on Hospital Mortality Br J Surg. 2012 Mar;99(3):404-410

11. Heinemann V, Haas M, Boeck, S. Neoadjuvant treatment of borderline resectable and non-resectable pancreatic cancer. [Accessed on: 31st January 2014]. Available at: http://annonc.oxfordjournals.org/content/early/2013/07/11/annonc.mdt239.full.pdf+html

12. Jonker D, Boutell E, Kamra J, Spithoff K. Chemotherapy or radiotherapy for resectable pancreatic adenocarcinoma: clinical practice guidelines. November 2007. [Accessed on: 30th January 2014]. Available at: http://www.cancercare.on.ca/common/pages/UserFile.aspx?serverId=6&path=/File%20Database/CCO%20Files/PEBC/pebc2-23s.pdf

Appendix: NHS Board Action Plans

A summary of actions for each NHS Board has been included within the following Action Plan templates. Completed Action Plans should be returned to WoSCAN within two months of publication of this report.

Action / Improvement Plan

Area:	HPB National MCN Lead
Action Plan Lead:	Mr Colin McKay
Date:	21/02/2014

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

No.	Action Required	Health Board Action Taken	Timescales		Lead	Progress/Action Status	Status (see Key)
			Start	End			
	Ensure actions mirror those detailed in Audit Report.	*Detail specific actions that will be taken by the NHS Board.*	*Insert date*	*Insert date*	*Insert name of responsible lead for each specific action.*	*Provide detail of action in progress, change in practices, problems encountered or reasons why no action taken.*	*Insert No. from key above.*
1.	NMCN to initiate work to examine the variation across NHS Regions in apparent curative care plan intent for patients with liver, gallbladder or proximal bile duct cancers.						
2.	NMCN to initiate work to further investigate the variation in surgical resection rates across NHS Boards/ Regions.						

Action / Improvement Plan

Area:	NHS Tayside
Action Plan Lead:	Mr Ian Tait
Date:	21/02/2014

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

No.	**Action Required**	**Health Board Action Taken**	**Timescales**		**Lead**	**Progress/Action Status**	**Status (see Key)**
			Start	**End**			
	Ensure actions mirror those detailed in Audit Report.	*Detail specific actions that will be taken by the NHS Board.*	*Insert date*	*Insert date*	*Insert name of responsible lead for each specific action.*	*Provide detail of action in progress, change in practices, problems encountered or reasons why no action taken.*	*Insert No. from key above*.
1.	NHS Tayside should review local audit processes to ensure all patients diagnosed with HPB cancer are captured in clinical audit.						
2.	All MDTs should continue to review their operational processes to ensure that all patients diagnosed with HPB cancer benefit from discussion of their management at an MDT meeting.						
3.	All NHS Boards/MDTs should now include review of 90-day post-operative mortality cases to be discussed at the annual NMCN mortality and mobidity meeting.						

No.	Action Required	Health Board Action Taken	Timescales		Lead	Progress/Action Status	Status (see Key)
			Start	End			
4.	All surgical centres should review protocols for referral to oncology to ensure all suitable patients are considered for chemotherapy, whether in the neo-adjuvant or adjuvant setting.						

Action / Improvement Plan

Area:	All NHS Boards
Action Plan Lead:	
Date:	21/02/2014

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

No.	Action Required	Health Board Action Taken	Timescales		Lead	Progress/Action Status	Status (see Key)
			Start	End			
	Ensure actions mirror those detailed in Audit Report.	*Detail specific actions that will be taken by the NHS Board.*	*Insert date*	*Insert date*	*Insert name of responsible lead for each specific action.*	*Provide detail of action in progress, change in practices, problems encountered or reasons why no action taken.*	*Insert No. from key above*.
1.	All MDTs should continue to review their operational processes to ensure that all patients diagnosed with HPB cancer benefit from discussion of their management at an MDT meeting.						
2.	All NHS Boards/MDTs should now include review of 90-day post-operative mortality cases to be discussed at the annual NMCN mortality and mobidity meeting.						
3.	All surgical centres should review protocols for referral to oncology to ensure all suitable patients are considered for chemotherapy, whether in the neo-adjuvant or adjuvant setting.						