Annual Report 2017-18

Northern Ireland Bowel Cancer Screening Programme

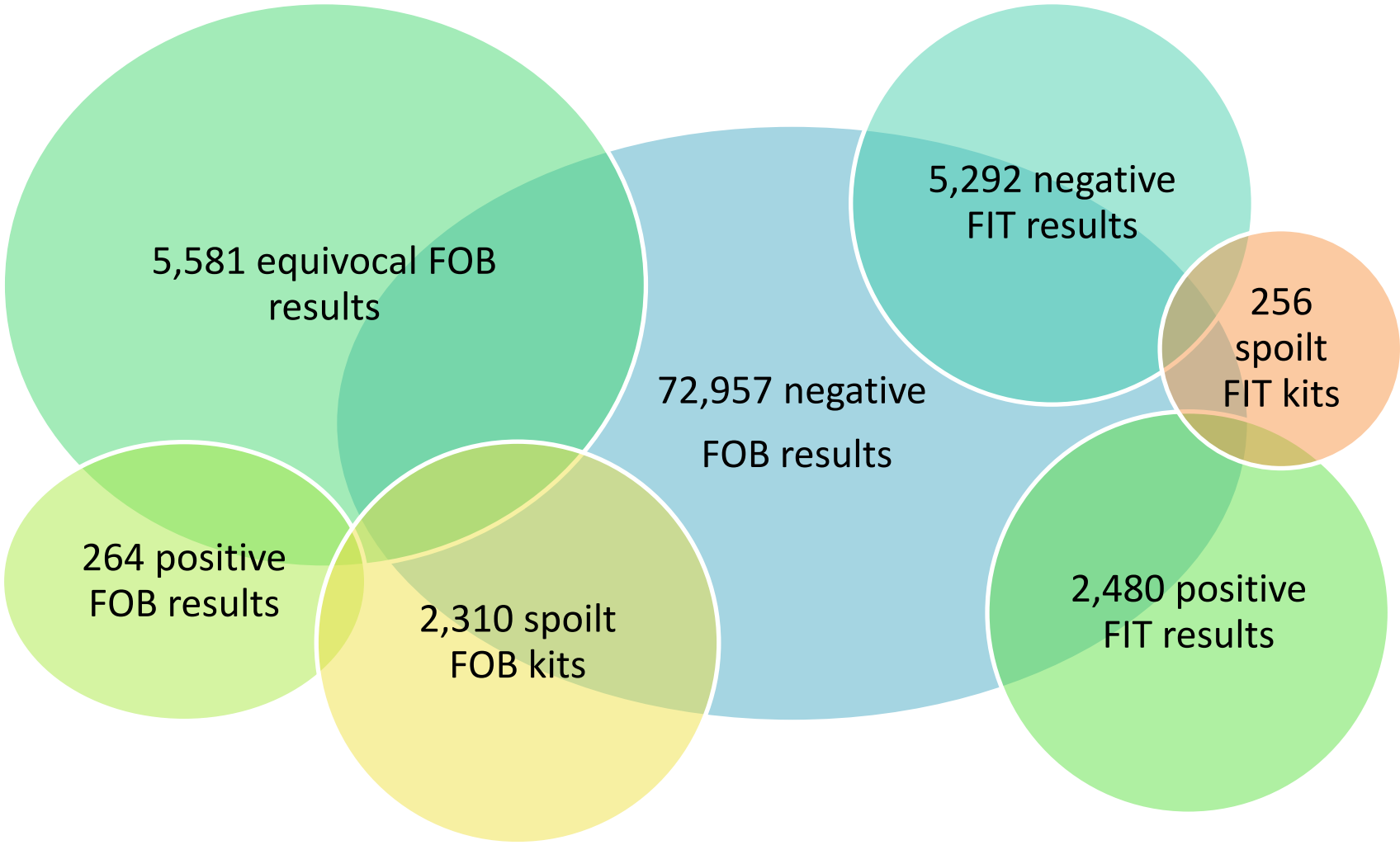
Contents

Summary and highlights for 2017-2018

This report covers activity within the Northern Ireland Bowel Cancer Screening Programme from 1 April 2017 to 31 March 2018 inclusive. The key statistical headlines are:

- 149,125 individuals were invited to participate in the screening programme;
- 81,112 FOBt and 8,028 FIT kits were received by the screening laboratory;
- 99.9% of all test kits received were validated within 2 working days of receipt in the laboratory;
- 3.4% of all kits issued with a final result were reported as positive;
- 3,154 appointments were made for colonoscopy pre-assessment;
- 37.8% of participants were offered a pre-assessment appointment within the standard of 14 days of contacting the helpline;
- The average wait for screening colonoscopy ranged from 19 to 46 days across Trusts;
- 99.5% of all screening CT colonography procedures had a report authorised within 7 calendar days;
- 3,707 histopathology specimens were processed and reported;
- 92.5% of histopathology specimens were reported within 7 calendar days of the date of the screening procedure;
- 112 screen detected colorectal cancers were diagnosed;
- 55.4% of screen detected cancers were classified as Dukes stage A* to B;
- At least one adenoma was detected in 47.2% of all index colonoscopies.

Diagram Representation of Bowel Screening Test Results



1 Introduction

1.1 Background and programme objectives

The Northern Ireland Bowel Cancer Screening Programme (BCSP) was launched in April 2010 with the aim of reducing the mortality and morbidity from colorectal cancer through early detection and treatment.

Colorectal (bowel) cancer is the second most common cause of cancer death in Northern Ireland. In 2017, 1,179 people were diagnosed with the disease and 489 died from it. However, it is well recognised that when bowel cancer is detected at a very early stage there is a 90% chance of successful treatment.

The screening programme is aimed at individuals aged 60-74 who do not have any symptoms. It uses a home collection kit, called a guaiac faecal occult blood test (FOBt), which is analysed to detect traces of blood in the stools. The presence of hidden blood in the stools is an indicator that further investigations are required as the participant may be at risk of bowel cancer. Those participants who have a positive screening test result are offered a colonoscopy procedure to visualise the bowel.

This report presents key information about the NI Bowel Cancer Screening Programme for 2017-18 and benchmarks performance against regional standards. It also describes new service and quality improvements undertaken during this period. The statistics presented here are used to monitor and continuously improve the quality of the screening programme.

1.2 Programme Delivery and Screening Pathway

1.2.1 Call recall process

The call/recall function of the BCSP is provided by the Business Services Organisation (BSO) through a team based in Franklin Street, Belfast. The screening team are co-located with the Family Practitioner Services staff and those who support the call/recall function of the Northern Ireland Cervical Screening Programme. They are responsible for the admin functions of the programme, including identification of the eligible cohort for screening, and issuing invitation and results letters. A patient information leaflet about the programme, *'Bowel Screening – The Facts'* is included with the invitation letter along with the test kit and instructions on how to complete it, *'How to take the Test'*.

Screening starts from the age of 60, with individuals invited to complete their first screening kit in the week following their 60th birthday. Screening will be offered every two years and individuals will remain eligible for inclusion in the programme up to their 75th birthday. Anyone 75 years and over who requires ongoing colonoscopy surveillance will continue to be followed up within the programme until they are returned to routine recall or a clinical decision is made for them to be ceased from further follow up.

1.2.2 Laboratory testing

The screening laboratory for bowel screening samples is based in the Causeway Hospital, Coleraine. The laboratory receives, processes and reports all the BCSP test kits for Northern Ireland.

Completed test kits are received by the screening laboratory and logged onto the Bowel Screening Information Management System (BSIMS) for testing. This is supported by the use of a personalised bar coding system to ensure the received test kit matches the details of the individual it was issued to.

The processing and reporting of the FOBt kits is a qualitative, manual process which involves laboratory technicians looking for a colour change on the test card when a test solution is applied. Testing determines one of four possible outcome reports:

Test result	Description
Negative result	0 of 6 wells contain traces of faecal occult blood
Equivocal (unclear) result	1 to 4 wells contain traces of faecal occult blood
Positive result	5 to 6 contain traces of faecal occult blood
Spoilt test kit	Samples not suitable for testing

Individuals with an equivocal or spoilt test result are sent a qualitative faecal immunochemical test (FIT) to provide a further sample. Qualitative FIT kits require two samples: one sample from two separate bowel motions, and can only result in a positive, negative or spoilt outcome.

Any test kit which is unsuitable for testing is recorded as spoilt. Some of the most common reasons for a spoilt test result are that the sample has not been applied correctly meaning it

cannot be tested. The second most common reason is that no date has been written on the sample. The laboratory and call/recall office make every reasonable effort to validate any differences to allow the test to be reported.

A small number of individuals appear to have on-going problems completing the test kits and in these cases the call/recall staff will make reasonable efforts to contact the individual directly to talk through their difficulties and offer advice.

1.2.3 Pre-assessment

Once the screening test result is validated by the laboratory staff on BSIMS a letter is generated and queued for printing and posting by the call/recall office.

Those participants who receive a positive FOBt or FIT result progress onto the next stage of the screening pathway. They receive notification of their result by letter and are advised to call the telephone helpline to make an appointment for pre-assessment.

Each Trust has nominated screening pre-assessment sites and colonoscopy centres as listed below.

HSC Trust	Pre-assessment sites	Colonoscopy centre
Belfast	Belfast City Hospital	Belfast City Hospital
Northern	Whiteabbey Hospital	Whiteabbey Hospital
South Eastern	Downe Hospital, Ulster Hospital	Downe Hospital
Southern	South Tyrone Hospital	South Tyrone Hospital
Western	Altnagelvin Area Hospital, South West Acute Hospital	Altnagelvin Area Hospital

The pre-assessment is carried out by the Specialist Screening Practitioner (SSP): a registered nurse, who will assess the individual's suitability for colonoscopy based on their medical history and current health. The SSP is also responsible for relaying the appropriate information regarding colonoscopy so that the participant can make an informed decision whether or not to continue with the screening process.

1.2.4 Colonoscopy

The colonoscopy procedure is carried out in a nominated screening colonoscopy centre by an approved screening colonoscopist. This may be either a consultant or nurse endoscopist who has completed the Northern Ireland 'Approval of Screening Colonoscopists' training course.

1.2.5 Radiology

If a participant is determined unsuitable for colonoscopy they may be offered CT Colonography (CTC) as an alternative investigation, as appropriate.

1.2.6 Histopathology

Samples submitted for histopathological assessment are reported in accordance with the Royal College of Pathologists guidelines. Each Trust has one named laboratory to which BCSP specimens are sent. The Belfast laboratory also provides a service for the South Eastern Trust. Each laboratory has nominated staff to report on screening specimens and a specific histopathology database has been developed to support the collection of standardised data on all specimens originating from the BCSP.

The pathology of the samples taken, along with their number and size, determine the participant's outcome and screening pathway and are in keeping with the guidelines of the British Society of Gastroenterology[1].

A simplified flowchart of the entire screening pathway is included as an Appendix**.**

[1] Cairns SR, Scholefield JH, Steele RJ et al. Guidelines for colorectal cancer screening and surveillance in moderate and high risk groups (update from 2002). *Gut* 2010;**59**:666-690.

2 Programme Performance

This report outlines the performance of the NI BCSP for the year 2017-18. The presented data is sourced from a combination of BSIMS, Specialist Screening Practitioner audits and the histopathology data collection tool.

Standard data reports are used to support the quality assurance of the screening programme and facilitate benchmarking of the Northern Ireland programme against regional standards and similar programmes elsewhere in the UK.

2.1 Call and recall

2.1.1 Invitations issued

149,125 invitation packs were issued for bowel cancer screening during 2017-18.

Reminder letters were issued to those individuals who had not returned a completed test kit within six weeks, and a final non-responder notification letter sent to the GP if no kit was received in the laboratory within a further six weeks. In excess of 69,000 non-responder letters were issued to GPs during that time. There were 13,093 more invitation packs sent in this year compared to 2016-17.

Table 1: Number of bowel cancer screening invitation packs and letters issued, by year. Northern Ireland, April 2015 – March 2018

	2015-16	2016-17	2017-18
Number of invitation packs issued (new and recall participants)	137,987	136,032	149,125
Number of reminder letters issued	80,179	80,031	86,350
Number of final non-responder notification letters sent to GPs	64,120	64,562	69,171

2.1.2 Freephone Helpline

The Freephone helpline is staffed from 9 am to 5 pm Monday to Friday, excluding public holidays. An out of hours message advises callers of the opening times of the helpline.

The helpline staff provide advice and reassurance for anxious participants and are a point of contact for general enquiries about the programme. Participants are able to speak to a member

of the call/recall team if they have any questions relating to the screening process, or to ascertain their eligibility for screening. The helpline is also used as the first point of contact for individuals who receive a positive screening test result.

The helpline received an average of 1,154 calls each month during 2017-18.

Table 2: Number of calls to NI BCSP Helpline and percentage answered, by month. Northern Ireland, 2017-18.

	Number of calls received by helpline	Percentage of calls answered
April	1,122	99%
May	1,204	100%
June	1,198	99%
July	1,163	100%
August	1,248	93%
September	1,195	99%
October	1,127	98%
November	1,173	97%
December	905	99%
January	1,424	98%
February	1,021	98%
March	1,069	98%
Total	13,849	

2.1.3 Uptake

Uptake is used as a measure of participation in the BCSP. The uptake rate is defined as the percentage of people who were invited in a specified period who have a complete screening test result available.

Analysis of uptake is run using a six month compliance period (i.e. the responder status six months after the initial invitation pack is issued). An interim uptake figure is available which examines those patients who have responded after 12 weeks.

Due to a change in methodology in the calculation of screening uptake, previous uptake data is not included as such data is no longer comparable.

Table 3: Bowel cancer screening uptake. Northern Ireland, 2017-18

	Screening Uptake (%)
Interim Screening Uptake (12 weeks)	51.8
Screening Uptake (6 months)	53.8

The majority of those who respond to an invite to participate in the screening programme, do so within 12 weeks. In 2017-18 there was a 2% difference between uptake calculated using a twelve week compliance period and that using a six month compliance period. Kits returned after six months of issue, although processed and reported, are excluded from the uptake calculation.

2.1.4 Uptake by gender

Bowel cancer screening is the only cancer screening programme offered to both men and women. When uptake is analysed by gender, a differential of 5.2% was noted in 2017-18, with women more likely to participate in the programme than men.

Table 4: Bowel cancer screening uptake rate at 6 months by gender. Northern Ireland, 2017-18

	Screening Uptake (%)
Female	56.3
Male	51.1
Total (NI)	53.8

2.1.5 Uptake by age

There is variation in uptake rates by age group, with older eligible individuals more likely to participate in bowel screening. The age of participants at the time their invitation was generated has been used when calculating uptake.

Table 5: Bowel cancer screening uptake rate at 6 months by age range. Northern Ireland, 2017-18

	Screening Uptake (%)
60-64	49.9
65-69	56.2
70-74	57.3
Total (NI)	53.8

2.1.6 Uptake by HSC Trust

There is variation in uptake rates between HSC Trusts in Northern Ireland. Belfast has the lowest uptake rate with 48.3% of individuals responding to a screening invite in 2017-18. This compares to 57.7% in the South Eastern Trust area.

Table 6: Bowel cancer screening uptake at 6 months by HSC Trust. Northern Ireland, 2017-18

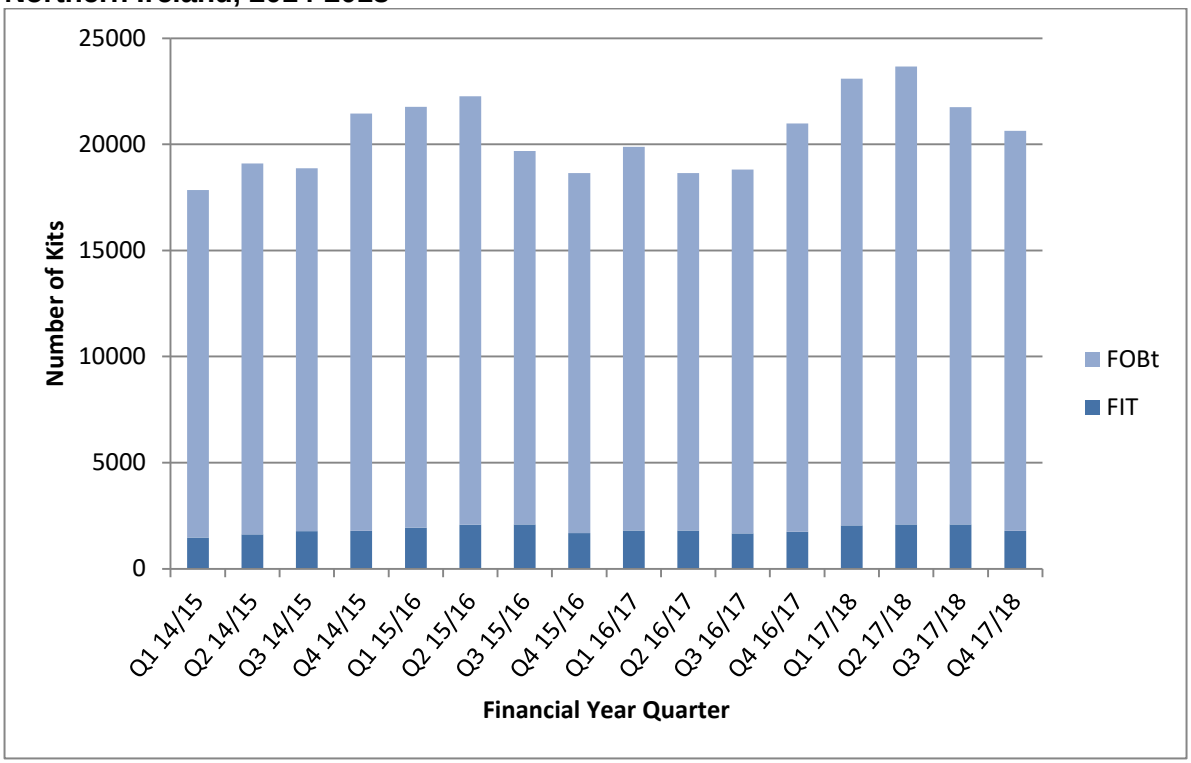
	Screening Uptake (%)
Belfast HSCT	48.3
Northern HSCT	55.3
South Eastern HSCT	57.7
Southern HSCT	52.8
Western HSCT	54.0
Total (NI)	53.8

2.2 Screening laboratory

2.2.1 Received kits

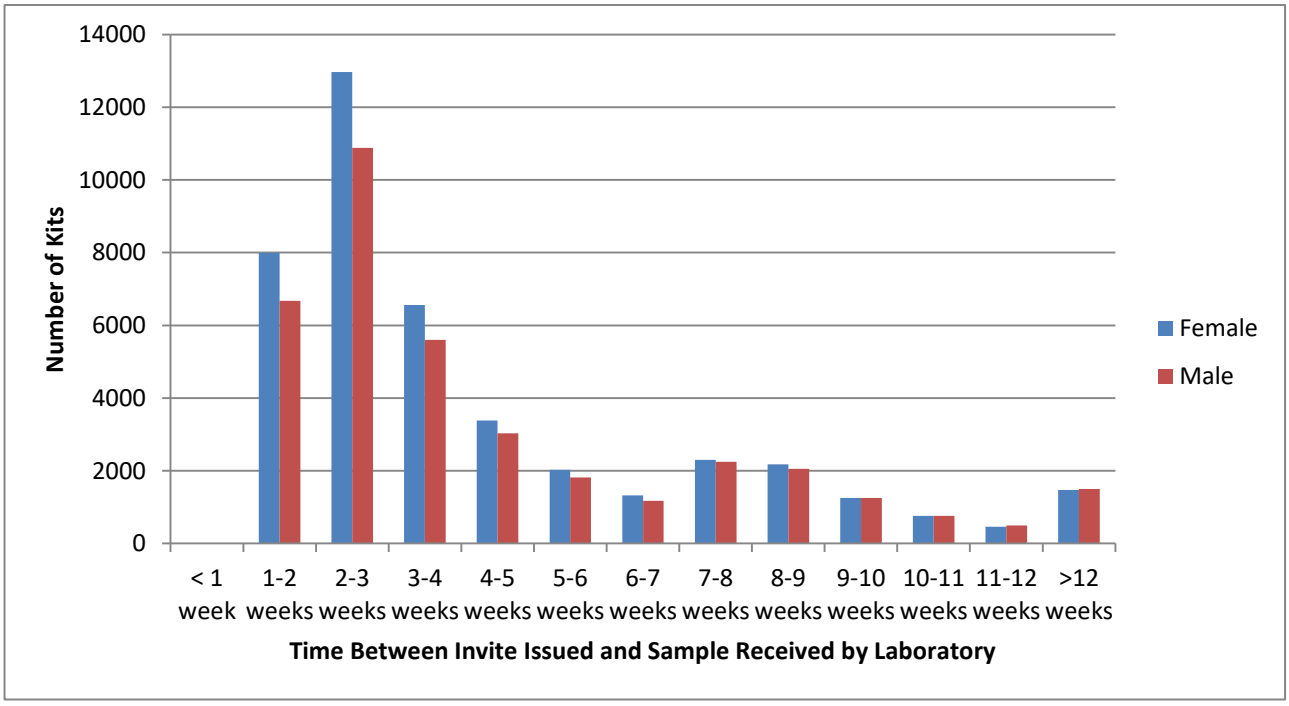
During 2017-18, a total of 81,112 FOBt and 8,028 FIT kits were received by the screening laboratory at Causeway Hospital.

Figure 1: Number of test kits received by the screening laboratory by kit type and quarter. Northern Ireland, 2014-2018



The majority of respondents returned their test kit within a few weeks of receiving it: 48% within three weeks and 76% within six weeks. The number of individuals returning kits each week decreased steadily from week three until weeks seven to eight which coincides with the reminder letter issued at week six. This can be seen in Figure 2, which demonstrates that the reminder letter prompts the return of additional completed test kits.

Figure 2: Number of FOBt kits received by the screening laboratory each week from date of invite, by gender. Northern Ireland, 2017-18



2.2.2 Test results

The majority of FOBt kits for analysis were reported as negative (89.9%), and these participants were returned to routine recall to be invited for FOBt screening again in two years' time. A small proportion (0.3%) were reported as positive, while 9.7% were either equivocal or spoilt and required further definitive testing.

Table 7: Number and percentage of test kits reported by the screening laboratory, by result. Northern Ireland, 2017-18

	FOBt	*% FOBt*	FIT	*% FIT*	Total	*% Total*
Negative	72,957	*89.9%*	5,292	*65.9%*	78,249	*87.8%*
Equivocal	5,581	*6.9%*	-	-	5,581	*6.3%*
Spoilt	2,310	*2.8%*	256	*3.2%*	2,566	*2.9%*
Positive	264	*0.3%*	2,480	*30.9%*	2,744	*3.1%*
Total Validated	81,112	*100.0%*	8,028	*100.0%*	89,140	*100.0%*

2.2.3 Spoilt kits

For the period April 2017 to end March 2018 the overall spoilt rate was 2.9% of all kits (FOBt and FIT) received for testing. The vast majority of people who complete a test kit are, therefore, able to do so by following the instructions provided. Participants whose FOBt kit is spoilt are subsequently asked to complete a FIT kit which requires fewer samples to be collected.

Those whose FIT kit is spoilt will be sent further FIT kits until they submit a testable kit. The reasons recorded for spoilt test kits are described in *Table 8*.

Table 8: Reason for spoilt test result. Northern Ireland 2017-18

	Number of test kits	%
Sample not applied correctly	627	24.4
No dates on samples (received outside 20 days)	414	16.1
Spoilt test kit result (1st)	358	14.0
No dates on samples (received within 20 days and no positive wells)	353	13.8
Samples not tested within 20 days of first sample date	275	10.7
No name on kit	234	9.1
Test kit expired	128	5.0
Name on kit different to bar code	84	3.3
Other identifier incorrect (DOB, initials or incomplete name)	50	1.9
Technical fail, kit damaged in lab. Not tested or testing not completed.	19	0.7
Returned unused test kit, participant closing episode	11	0.4
Unused kit (no sample), no reason given for not completing in BSIMS or a letter	10	0.4
Quality Control fail	2	0.1
Spoilt test kit result (1st) (Technical fail)	1	<0.1
Total	2566	100

2.2.4 Screening test positivity rate

The screening test positivity rate is defined as the number of participants with a positive result as a proportion of all participants with a complete screening test result (i.e. either a positive or negative result).

For screening kits received in 2017-18, the overall screening test positivity rate was 3.4% (31.9% for FIT kits and 0.4% for FOBt kits).

Table 9: Percentage of positive screening test results by HSC Trust and year. Northern Ireland, 2013-18

	Belfast	Northern	South Eastern	Southern	Western	Northern Ireland
2013-14	2.89	2.27	2.17	2.56	2.28	2.40
2014-15	3.68	2.89	2.72	2.90	2.98	3.03
2015-16	3.79	3.42	2.92	3.35	3.57	3.38
2016-17	3.94	3.10	2.77	3.30	3.53	3.30
2017-18	3.88	3.24	2.87	3.38	3.79	3.39

The screening test positivity rate varies slightly by Trust, with Belfast having the highest rate of 3.88%. South Eastern Trust had the lowest positivity rate of 2.87%. This may reflect differing prevalence of risk factors for colorectal disease in these populations, such as the association with deprivation.

2.2.5 Laboratory Standards

It is important that the laboratory tests and validates kits in a timely manner, so that participants receive their screening results as soon as possible.

99.93% of all test kits received in 2017-18 were validated within 2 working days of receipt in the laboratory.

This is in line with the NIBCSP standard which states that 100% of all kits should be tested and validated within two working days of receipt in the laboratory.

Table 10: Time between test received by laboratory and date result validated on BSIMS. Northern Ireland, 2017-18

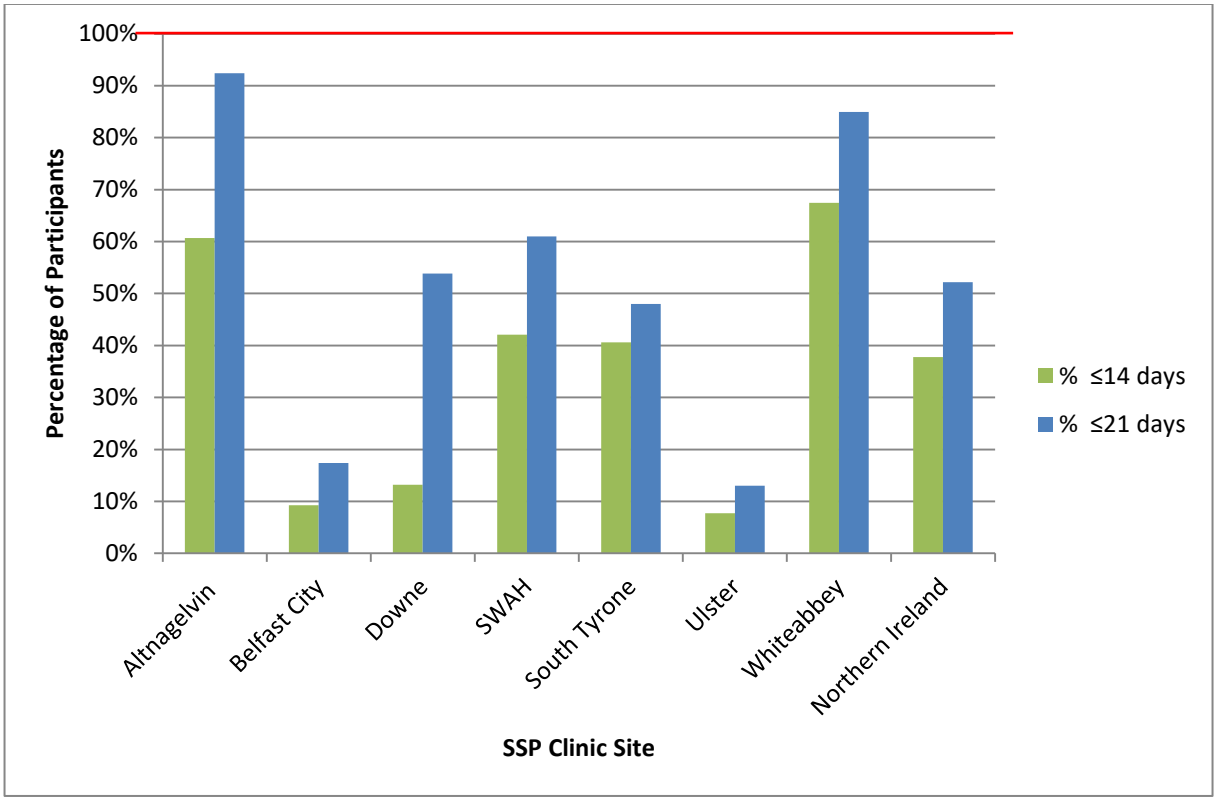
Working days from receipt of kit in lab	Number of FOBt kits	*FOBt kits validated Cumulative %*	Number of FIT kits	*FIT kits validated Cumulative %*
0	72,609	*89.5*	7,870	*98.0*
1	8,335	*99.8*	137	*99.7*
2	113	*99.9*	17	*99.9*
3	49	*99.9*	2	*99.9*
4	3	*99.9*	0	*99.9*
5	2	*99.9*	1	*99.9*
6	0	*99.9*	1	*100*
7	1	*100*	-	-
Total	81,112	*100*	8,028	*100*

2.3 Colonoscopy pre-assessment

2.3.1 Waiting times

The programme aims to offer all participants a date for SSP pre-assessment within 14 calendar days from contacting the helpline.

Figure 3: Percentage of participants offered an SSP appointment with 14 days or 21 days of contacting the helpline, by SSP clinic site. Northern Ireland, 2017-18



Across all clinics, 37.8% of participants were offered an SSP appointment within the standard of 14 days of contacting the helpline.

All types of SSP appointments are included, i.e. initial, surveillance and repeat pre-assessments. Also included are pre-assessments carried out to reassess participant fitness if declared temporary unfit at previous assessment.

2.3.2 SSP Clinic Activity

In Northern Ireland, 3,154 appointments were made for colonoscopy pre-assessment in 2017-18.

Variation was noted in attendance rates across screening sites and HSC Trusts.

Table 11: SSP clinic attendances by Trust. Northern Ireland, 2017-18

		Number of appointments attended	Number of appointments DNA'd	*DNA rate (%)*
BHSCT	Belfast City Hospital Endoscopy Unit	623	22	*3.4*
NHSCT	Whiteabbey Hospital Endoscopy Unit	809	7	*0.9*
SEHSCT	Both sites	521	10	*1.9*
	Ulster Hospital	405	10	*2.4*
	Downe Bowel Screening Assessment Clinic	116	0	*0*
SHSCT	South Tyrone Hospital	527	8	*1.5*
WHSCT	Both sites	608	19	*3.0*
	Altnagelvin Hospital Endoscopy Unit	449	11	*2.4*
	S.W.A.H	159	8	*4.8*
Northern Ireland		3,088	66	*2.1*

2.4 Diagnostic Screening procedures

2.4.1 Activity

Participants who are assessed as fit for further investigation, are offered a colonoscopy as the first line diagnostic investigation. In a small proportion of cases, a CT colonography may be offered as an alternative. Flexible sigmoidoscopy may be undertaken as an additional follow up procedure to check the site where a polyp has been removed. For a small number of participants, an inaccessible or complex polyp may require surgery to remove it. The volume of procedures carried out by each Trust in 2017-18 is tabled below.

Table 12: Number of screening procedures, by Trust and type of procedure. Northern Ireland, 2017-18

	Belfast	Northern	South Eastern	Southern	Western	NI
Colonoscopy	528	665	465	455	543	2,656
CT Colon	100	89	68	39	78	374
Flexible sigmoidoscopy	32	38	29	38	27	164
Surgery – complex polyp*	8	11	8	11	3	41
Total	668	803	570	543	651	3,235

** Surgery refers to surgical procedures which took place because endoscopic polypectomy was not possible or diagnostic procedures following "suspicious of malignancy" endoscopy.*

The diagnostic procedures can be further broken down as to the reason why they were undertaken. The majority of procedures are performed as the first investigation for a participant following a positive screening test result (70.9% of screening colonoscopies). However, 22% of screening colonoscopies were undertaken on participants as part of the adenoma surveillance pathway.

Table 13: Reason for diagnostic screening procedure, by type of procedure. Northern Ireland, 2017-18

	Colonoscopy (%)	CTC (%)
Index procedure (first procedure in episode)	70.9	68.2
Adenoma Surveillance	22.0	8.3
Endoscopy following abnormal CTC	1.4	-
Repeat procedure[2]	5.7	23.5
Total	100%	100%

[2] Repeat procedure refers to any procedure which took place following index or adenoma surveillance procedure, excluding endoscopy following abnormal CTC; which is monitored separately. A repeat procedure can be requested if the preceding procedure(s) is incomplete or bowel preparation poor, or, to check clearance of the bowel or completeness of excision.

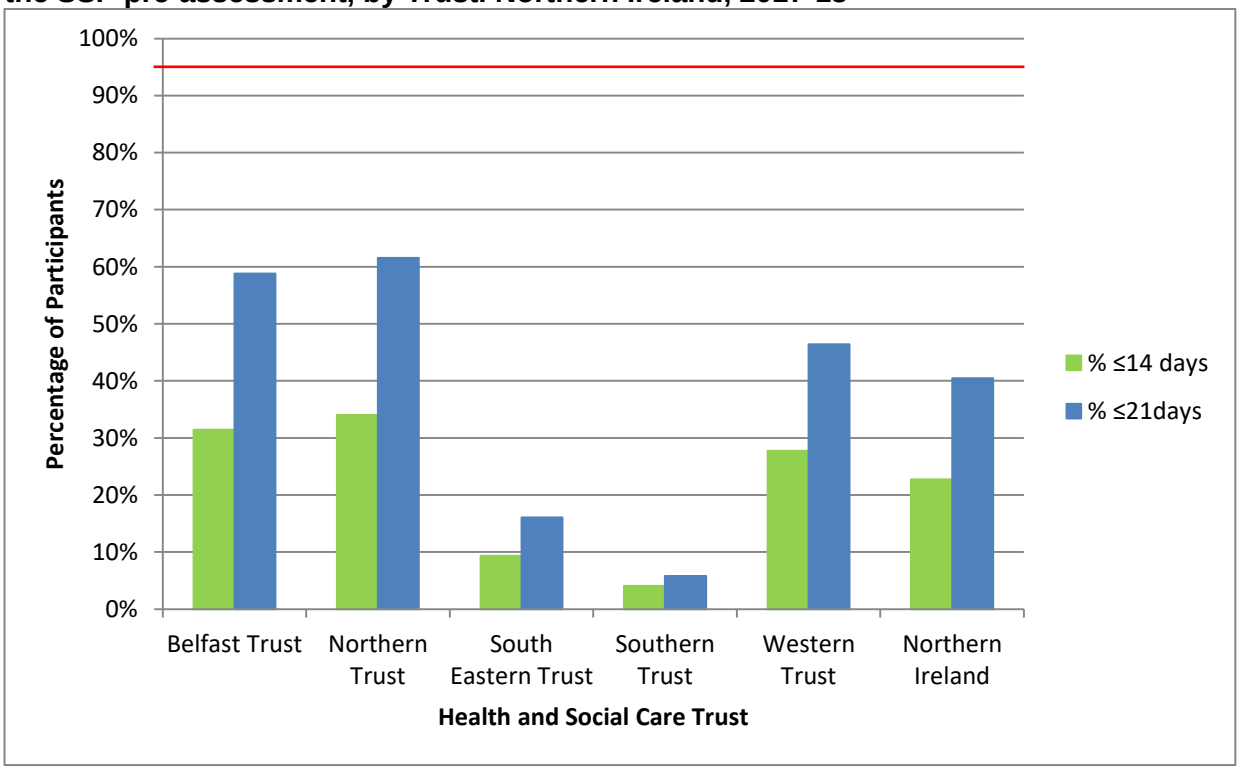
2.4.2 Screening colonoscopy waiting times

It is important that participants are offered an appointment for an appropriate diagnostic procedure in a timely manner to minimise anxiety and promote early diagnosis. The programme standard is that 95% of participants should be offered a date for index colonoscopy within 14 calendar days of their SSP pre-assessment.

No Trust in Northern Ireland met this standard in 2017-18. Across Northern Ireland, 22.7% of participants were offered a date for colonoscopy within the standard of 14 days of SSP assessment, and 40.5% of participants were offered a date for colonoscopy within 21 days.

The average wait for a colonoscopy ranged from 19 to 46 days across Trusts.

Figure 4: Percentage of patients offered an index colonoscopy within 14 and 21 days of the SSP pre-assessment, by Trust. Northern Ireland, 2017-18



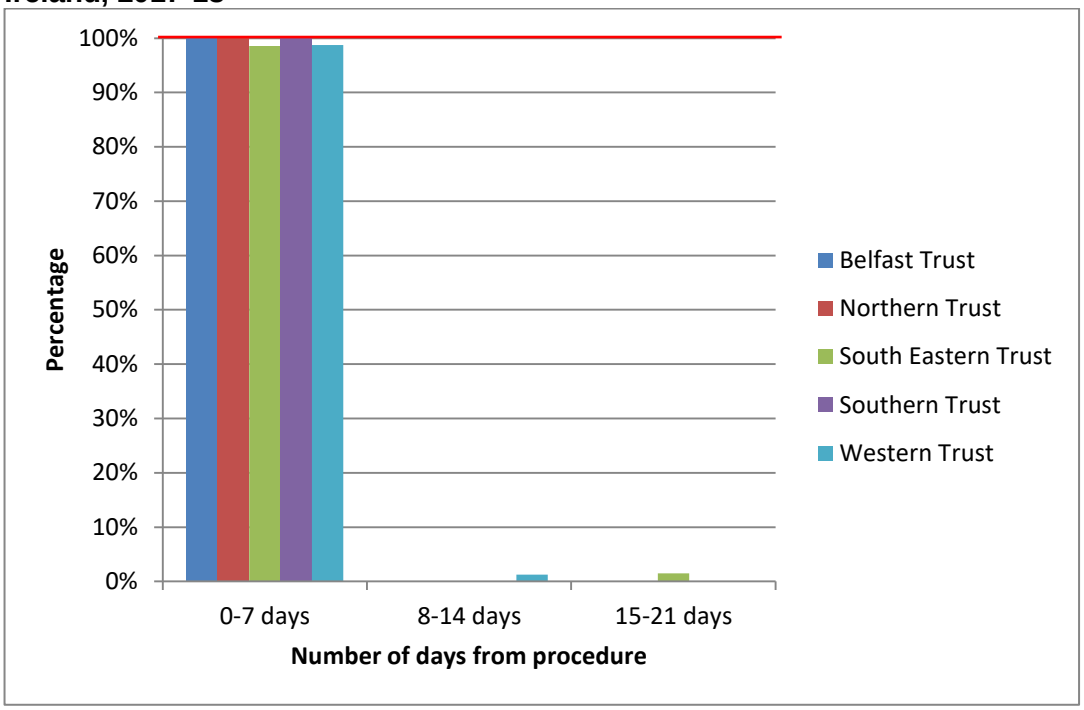
2.4.3 Timeliness of radiology reports

The programme aims to ensure that participants who have a diagnostic procedure have their results reported in a timely manner. The standard relating to CT colonography is that 100% of reports should be authorised within 7 calendar days of the date of the procedure.

For Northern Ireland, 99.5% of all screening CT colonography procedures, carried out in 2017-18, had their reports authorised within 7 calendar days.

Three of the five HSC Trusts achieved 100% of reports authorised within the standard of 7 days. Overall, 88.8% of procedures were reported and authorised within 1 day.

Figure 5: Time between CT colonography and authorisation of report, by Trust. Northern Ireland, 2017-18



2.5 Histopathology

2.5.1 Activity

When a polyp is seen at colonoscopy, it is removed and sent to the pathology laboratory for analysis. Biopsies may also be taken from any suspicious looking areas of the bowel wall.

Over 3,700 histopathology specimens were processed and reported for the Northern Ireland bowel cancer screening programme in 2017-18.

An individual participant can generate one histopathology request, but that request may include one or more specimens.

Table 14 shows the number of histopathological requests and the number of specimens reported by each Trust for screening procedures carried out in 2017-18. The activity is captured from two different data sources; BSIMS (bowel screening information management system) and the polyp database (database of all BCSP labelled specimens maintained by the laboratories). The volume of specimens is taken from the polyp database. As we can assume cases are missed from the

polyp database, due to samples not being correctly labelled as BSCP, we can also assume that the true number of specimens for analysis should be slightly higher than that reflected in the table.

Table 34: Number of histopathology requests and specimens reported, by Trust. Northern Ireland, 2017-18

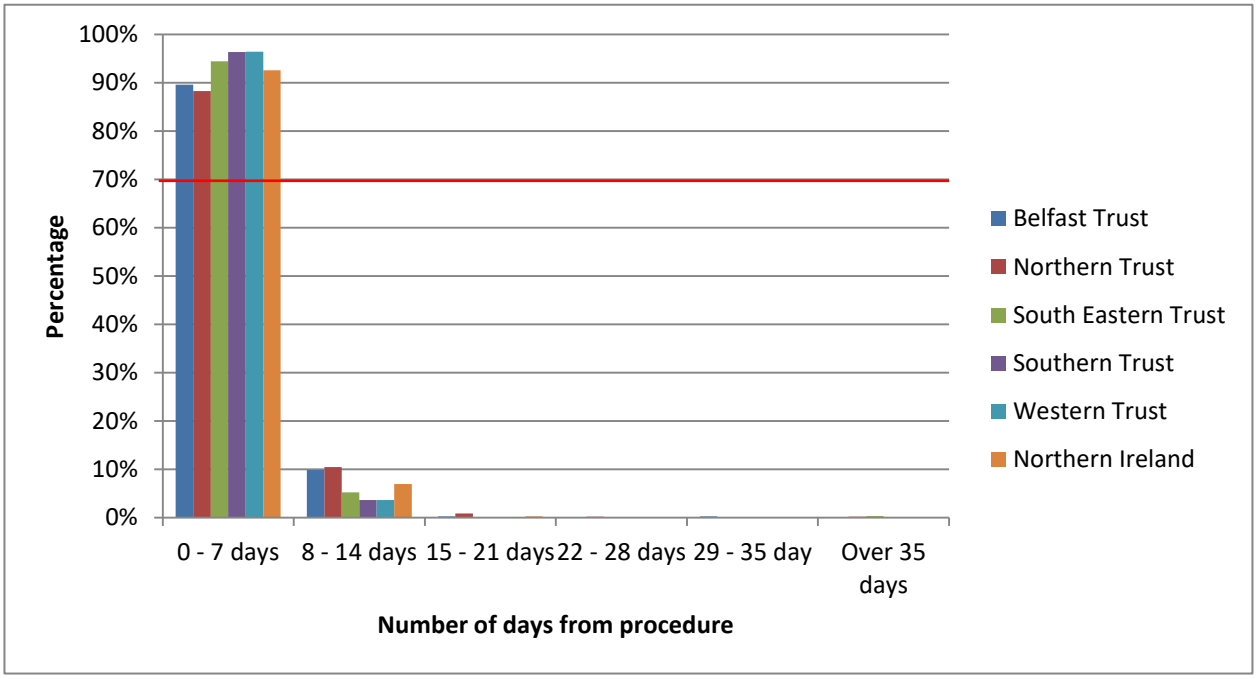
	Belfast	Northern	South Eastern	Southern	Western	N.I.
Histo Requests (BSIMS)	355	460	286	303	360	1,764
Histo Requests (specimen DB)	343	379	235	289	332	1,578
Specimens (specimen DB)	771	887	511	639	899	3,707

2.5.2 Timeliness of histopathology reports

The programme aims to authorise 80% of histopathology reports within 7 calendar days of the date of a procedure. This standard was achieved by all Trusts in 2017-18.

Overall in Northern Ireland, 92.5% of histopathology specimens were reported within 7 days of the date of a screening procedure in 2017-18.

Figure 6: Time between screening procedure and authorisation of histopathology report, by Trust. Northern Ireland, 2017-18



3 Detection of adenomas

Colonoscopy can detect small polyps (growths) in the lining of the bowel. While most of these are benign, one type, called adenomas, show features which are of greater concern. Up to 10% of adenomas can become cancerous over a 10 year period if left undetected or not removed.

The adenoma detection rate (ADR) monitors the effectiveness of the screening programme in identifying adenomas. The ADR is calculated as the number of index colonoscopies with at least one adenoma detected as a proportion of all index colonoscopies carried out.

In 2017-18 at least one adenoma was detected in 47.2% of all index screening colonoscopies.

The ADR varied across Trusts, ranging from 41.5% in the South Eastern Trust to 50.9% in the Northern Trust. Factors affecting this variation include differences between staff performing the procedures and population differences.

Table 47: Adenoma detection rates by Trust. Northern Ireland, 2017-18

	Number of index colonoscopies	Number of adenomatous index colonoscopies	Adenoma detection rate (ADR)
Belfast Trust	389	188	48.3%
Northern Trust	454	231	50.9%
South Eastern Trust	342	142	41.5%
Southern Trust	335	148	44.2%
Western Trust	364	180	49.5%
Northern Ireland	1,884	889	47.2%

4 Screen detected cancers

4.1 Screen detected cancers by Trust

In 2017-18, there were 112 participants diagnosed with a screen detected bowel cancer in Northern Ireland.

The highest number of screen detected cancers was diagnosed in the Northern Trust (32), with 15-28 cases being diagnosed in each of the other four Trusts in the year.

Table 15: Number of screen detected cancers, by Trust. Northern Ireland, 2017-18.

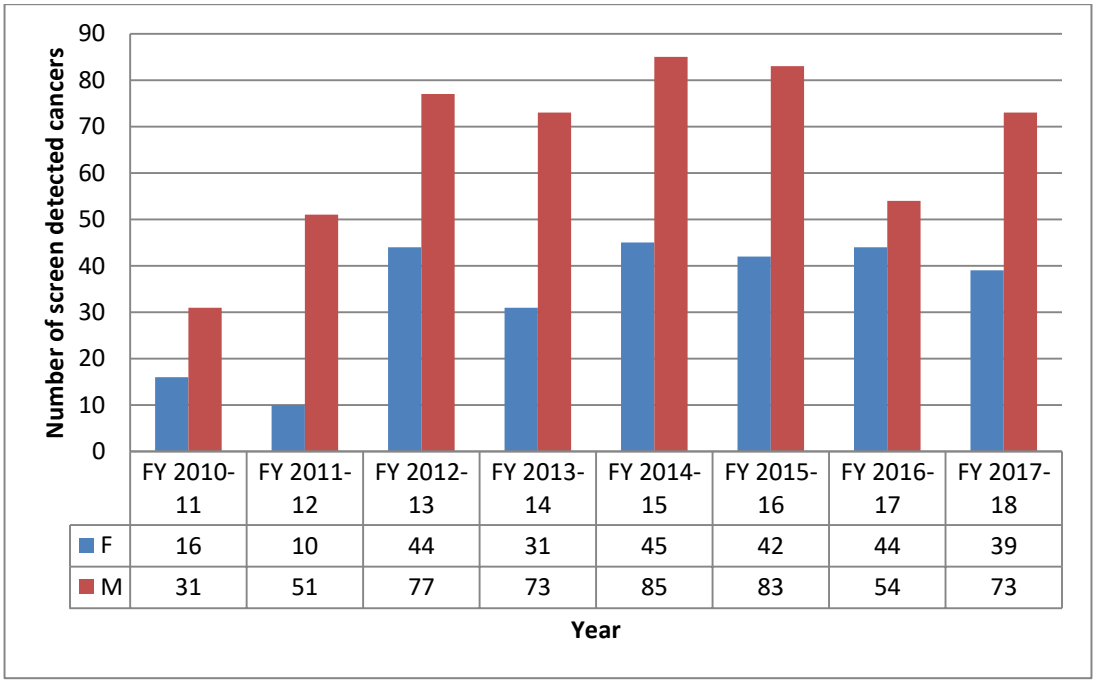
	Female	Male	Total
Belfast Trust	7	21	28
Northern Trust	14	18	32
South Eastern Trust	8	7	15
Southern Trust	6	15	21
Western Trust	4	12	16
Northern Ireland	39	73	112

4.2 Screen detected cancers by gender

There have been 798 screen detected cancers diagnosed from the introduction of the Bowel Cancer Screening Programme in April 2010 to the end of March 2018. This number excludes incidental cancers, defined within the programme as cancers not subject to endoscopy follow up (e.g. squamous cell carcinoma, lymphoma).

Overall, 34% of screen detected cancers have been diagnosed in female participants and 66% of screen detected cancers have been diagnosed in male participants. In 2017-18 the gender breakdown closely mirrored this trend, with 34.8% of screen detected cancers diagnosed in female participants, and 65.2% of screen detected cancers diagnosed in male participants.

Figure 7: Screen detected bowel cancers by gender. Northern Ireland, April 2010-March 2018



	FY 2010-11	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18
F	16	10	44	31	45	42	44	39
M	31	51	77	73	85	83	54	73

Source: NI histopathology bowel cancer screening database.

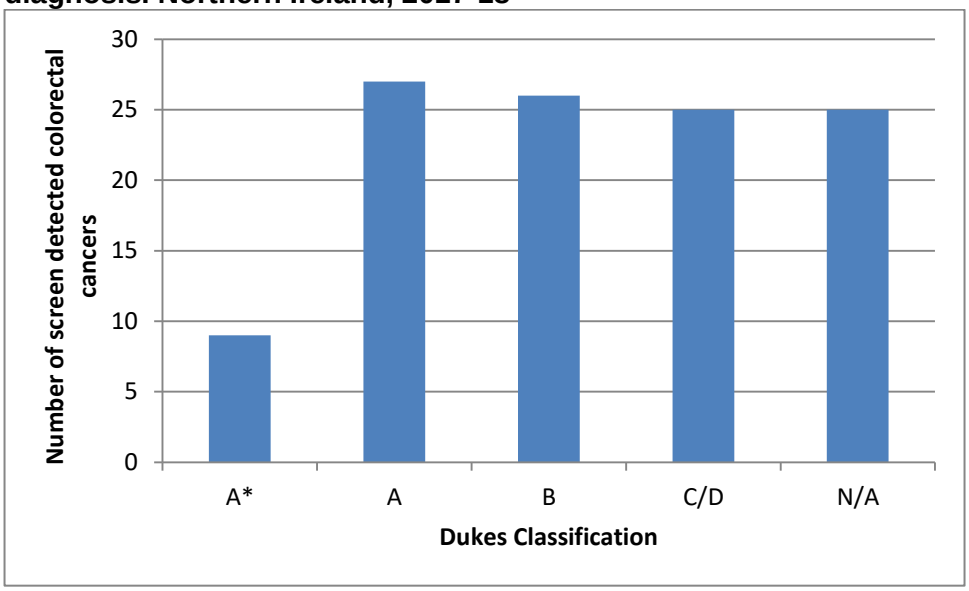
4.3 Cancer Staging

All diagnosed colorectal cancers are staged according to the infiltration and spread of the cancer cells within and beyond the bowel. Dukes is a classification system for colorectal cancers and was applied to those cancers diagnosed in 2017-18. It has since been superseded by the TMN staging system. Cancers at the earliest stage which have not infiltrated through the bowel wall are classified as Dukes A and have a 90% 5 year survival rate. Those cancers which have widespread metastases (involvement of other organs) at diagnosis are classified as Dukes D.

In Northern Ireland, 32.1% of screen detected cancers in 2017-18 were either cancer within polyp cases (A*) or Dukes stage A.

Over half (55.4%) of screen detected cancer cases in 2017-18 were stages A* to B.

Figure 8: Number of screen detected colorectal cancers, by Dukes classification at diagnosis. Northern Ireland, 2017-18[3]



4.4 Crude cancer detection rate

The crude cancer detection rate is calculated as the number of participants, invited in 2017-18, with a screen detected bowel cancer as a proportion of those participants with a final screening result available (i.e. positive or negative FOBt/FIT result). It is a measure of how effective the programme is at picking up cancers.

The crude cancer detection rate has been calculated for Northern Ireland and by Trust, based on the cohort invited for screening in 2017-18. As the numbers of screen detected cancer are small, this data should be interpreted with caution.

Overall for Northern Ireland, a crude cancer detection rate of 0.12% suggests that 12 cancers are detected for every 10,000 people who are issued with a screening test result.

[3] Please note that A* refers to early cancers (stage pT1 or 'polyp' cancers) with no lymph nodes available for evaluation as treatment was by local excision only. "N/A" encompasses both "not assessable" and "non-applicable" cases. Cases recorded as Dukes stage 'not applicable' refer to adenocarcinomas treated with neoadjuvant (pre-operative) therapy, in which event Dukes stage cannot be applied. Cases classified as Dukes stage 'not assessable' are those where the participant has been deemed unfit for surgical resection (often in palliative setting of metastatic disease) or surgery has been performed outside the NHS and full pathology information is not available.

Table 56: Crude cancer detection rate, by Trust. Northern Ireland 2017-18

	Number of participants with a final screening result	Number of participants with screen detected bowel cancer	Crude cancer detection rate
Belfast Trust	14,335	25	0.17%
Northern Trust	20,889	23	0.11%
South Eastern Trust	17,694	17	0.10%
Southern Trust	14,340	20	0.14%
Western Trust	12,899	13	0.10%
Northern Ireland	80,157	98	0.12%

5 Recorded significant events or adverse outcomes

All screening programmes can do harm as well as good. This may be due to over-diagnosis of disease resulting in unnecessary investigations and treatments, or through adverse outcomes linked to the screening process itself.

Colonoscopy is an invasive procedure. It requires the participant to take bowel preparation solutions in advance, they may require minor sedation during the procedure, bleeding can happen at the site where a polyp is removed and on very rare occasions, adverse events such as perforation of the bowel or even death can occur. On occasion the colonoscopist may decide to abandon the procedure (e.g. if the patient is too distressed or uncomfortable) or the patient may request that the procedure is stopped before it is completed.

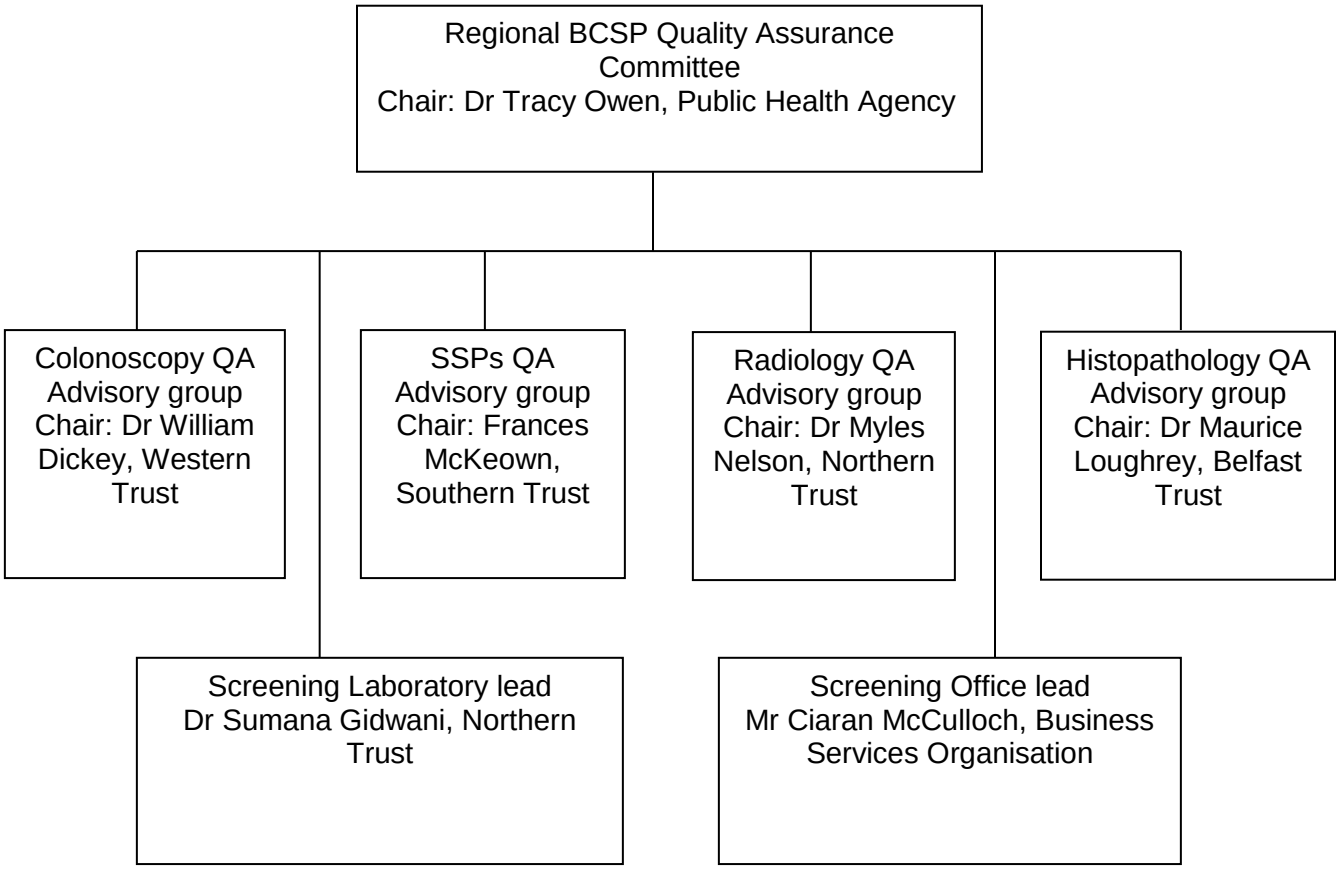
It is therefore important that the screening programme monitors any significant events or adverse outcomes which occur in screening participants so that we can learn from these in the future.

In 2017-18, 25 learning events were reported to the PHA via the learning event protocol. No serious adverse incidents were reported.

6 Quality Assurance

The purpose of quality assurance is to monitor, maintain and improve on minimum standards of service, performance and quality across all aspects of the bowel cancer screening programme. This function is led and facilitated by the PHA and supported through the structured input from a range of professionals across key clinical disciplines.

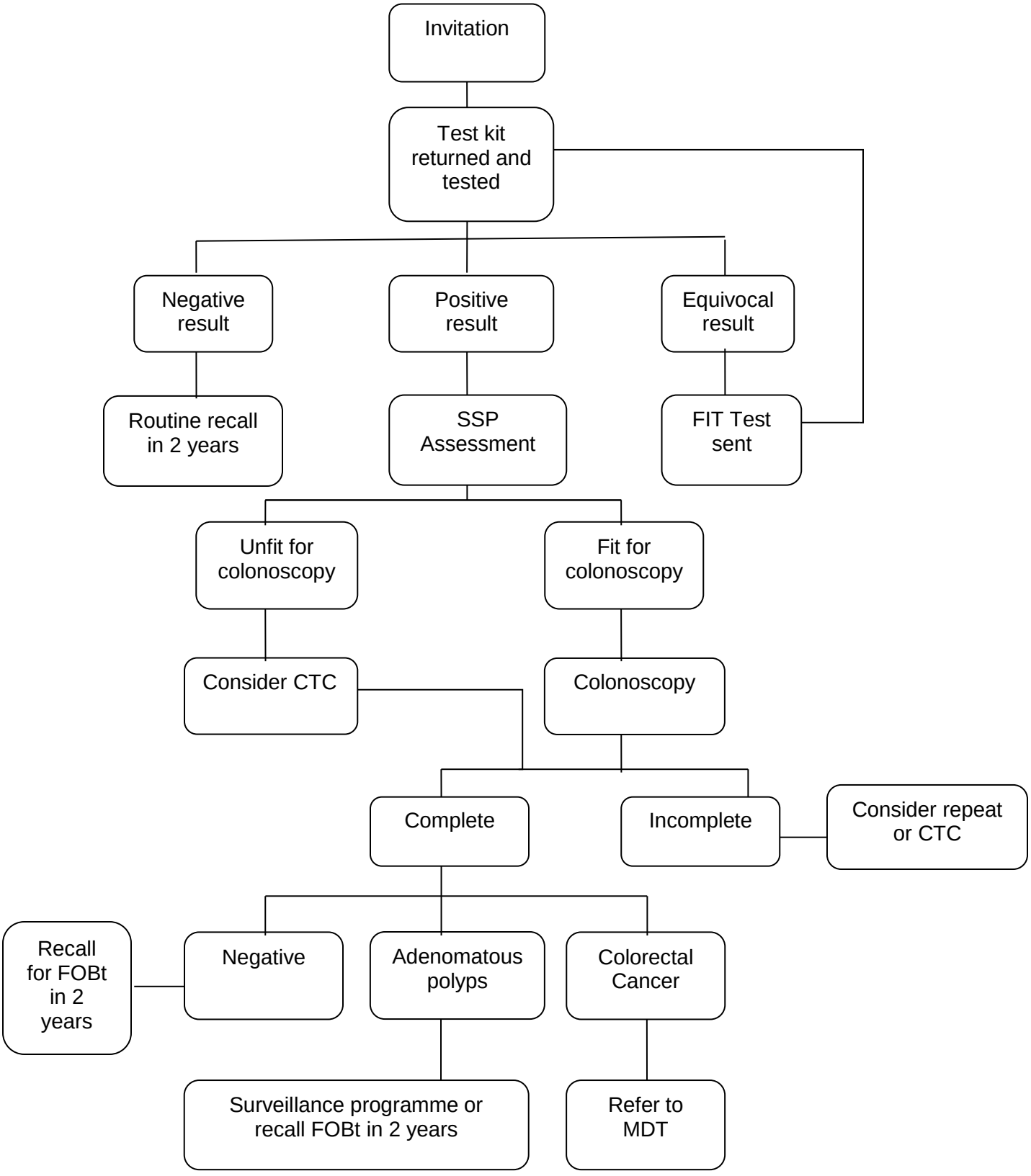
The lead names in the diagram below represent those in post during financial year 2017-18.



Ongoing quality assurance activities include:

- Regular disciplinary led meetings across the programme
- Monthly data monitoring of key performance indicators
- Regular performance review with BSO on call/recall service
- Rolling programme of formal quality assurance visits to Trusts

Appendix: Simplified screening pathway



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