

Programme Report  
**2012-2015**  
Round One



**BowelScreen**

An Clár Náisiúnta Scagthástála Putóige  
The National Bowel Screening Programme



# BowelScreen

An Clár Náisiúnta Scagthástála Putóige  
The National Bowel Screening Programme

## Screening charter

### About BowelScreen – The National Bowel Screening Programme

- BowelScreen – The National Bowel Screening Programme offers free bowel screening to men and women aged 60 to 69. The BowelScreen programme will over time be offered to all people aged 55-74.
- The bowel screening test is carried out in your own home.
- Bowel screening can detect changes in the bowel before they become cancer.
- Bowel screening aims to find bowel cancer at an early stage when it is easier to treat.

### Our commitment to you

- We will respect your privacy, dignity, religion, race and cultural beliefs.
- We will arrange services and facilities so that you can use the service, including special needs.
- We will keep your screening records safe and confidential.
- We will welcome your views and take them into account.
- We will provide a Freephone information and support line during normal working hours.
- We will offer you free screening every two years while you are aged 60 to 69, once you become known to the programme.

- We will provide information explaining each step in the screening process.
- We will send your home test kit, instructions and information to you within five working days of you letting us know you want to take part in the programme.
- We will screen your test in a laboratory that meets high quality standards.
- We will send your test result to you and to your GP (family doctor) within four weeks.

### If you take part in the screening programme and your test result is not normal

- We will offer you a colonoscopy – a special examination of your bowel.
- A colonoscopy will be offered within four weeks of you being assessed as suitable.

### If you need treatment

- We will tell you sensitively and honestly.
- We will explain the treatment available to you.
- We will encourage you to share in decision-making about your treatment.
- We can include your partner, friend or relative in any discussions if that is what you want.

- We will offer you surgery or other treatment within 25 working days after your colonoscopy, if you need it.
- We will offer you support from a nurse before and during your colonoscopy.
- You have the right to refuse treatment, to get a second opinion or to choose an alternative treatment.

### Ways you can help us

- Read any information we send you and if you have any questions you can call the Freephone information and support line.
- Follow the instructions with your BowelScreen home test and return the test to us within seven days.
- If we refer you for more tests, keep your appointment time and give at least three days' notice if you need to change your appointment.
- Tell us if you have special needs that we need to plan for.
- Tell us if you change your address.
- Tell us what you think of the service and the care you received. Your views will help us to improve the service for you and for other people.

Freephone  
**1800 45 45 55**  
[www.bowelscreen.ie](http://www.bowelscreen.ie)



An tSeirbhís Náisiúnta Scagthástála  
National Screening Service

The National Screening Service is part of the Health Service Executive. It encompasses BreastCheck – The National Breast Screening Programme, CervicalCheck – The National Cervical Screening Programme, BowelScreen – The National Bowel Screening Programme and Diabetic RetinaScreen – The National Diabetic Retinal Screening Programme.

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# Introduction from the Head of Screening, National Screening Service

The National Screening Service (NSS), part of the Health Service Executive, has gained significant expertise, as well as a positive national and international reputation, in the development, implementation and delivery of successful population-based screening programmes in Ireland.

The NSS manages four screening programmes: BreastCheck – The National Breast Screening Programme, CervicalCheck – The National Cervical Screening Programme, Diabetic RetinaScreen - The National Diabetic Retinal Screening Programme and BowelScreen - the National Bowel Screening Programme.

## Definition of screening

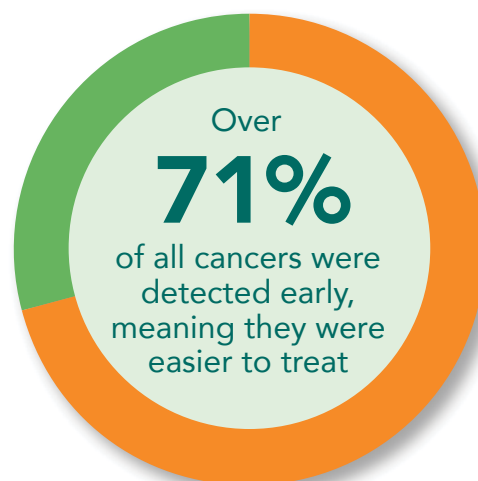
Screening is a means of detecting disease before symptoms appear. In screening for cancer, disease can be detected at an early stage which can often increase treatment options, as well as reduce the invasiveness of that treatment. Screening aims to improve survival rates, reduce morbidity and mortality and improve the quality of life of those who have developed cancer.

The NSS provides screening for both cancer and non-cancer disease. Although screening does not provide a guarantee of diagnosis and cure for all patients, it provides an opportunity for those who have a positive test to receive confirmatory diagnostic testing, before further definitive diagnoses and treatment stages are put in place.

## Population-based screening

Population-based call, re-call screening programmes provide a consistent, high-quality and standardised approach to identifying the population most at risk from a particular disease, through to diagnosis and referral for treatment. The process begins with developing a register of clients in the identified population, inviting participation in the programme, offering clear referral and treatment pathways within set time limits and developing a mechanism to re-call clients at defined intervals.

Organised screening has many advantages. In particular, the process makes it possible to provide effective early detection and reduced mortality with a test for which consistent repeat participation is necessary, in order to achieve acceptable clinical benefits. This is why adherence to regular screening is an important element of all NSS screening programmes.





## BowelScreen

BowelScreen began in 2012, with the aim of offering free screening to men and women aged 55 to 74, on a two-yearly cycle.

The first cycle or 'round' of the programme was carried out over approximately three years, due to the complexity of establishing a programme of its type. In addition, the programme has been implemented on a phased basis, starting with men and women aged 60 to 69. It is important to note that the maximum benefits, in terms of reduction in mortality and cost-effectiveness, will occur only when the programme targets the full 55 to 74 age population.

The programme has learned extensively from the experience of the first round of implementation. Throughout the second and subsequent rounds, the NSS will continue to work with our acute hospital screening partners to ensure sufficient and high quality endoscopy capacity is in place to meet programme needs. The future focus will also be on promoting the programme and to identify and remove any perceived barriers to screening uptake.

At this juncture, I would like to thank all those involved in the development, implementation and introduction of the BowelScreen programme for their dedication and support.

I am delighted that we are now in a position to publish the first round results for BowelScreen, which demonstrate very encouraging outcomes. With the ongoing support of partners, we will be able to ensure that we can continue to provide screening services of the highest international standard for the people of Ireland.

**Charles O'Hanlon,**  
Head of Screening,  
National Screening Service

# Message from the Clinical Director, BowelScreen

**I am delighted to present the key findings arising out of the first round of colorectal screening in Ireland, delivered by BowelScreen and the National Screening Service (NSS). The results clearly indicate that BowelScreen has already made a significant difference to the health of the people of Ireland.**

## Colorectal cancer in Ireland

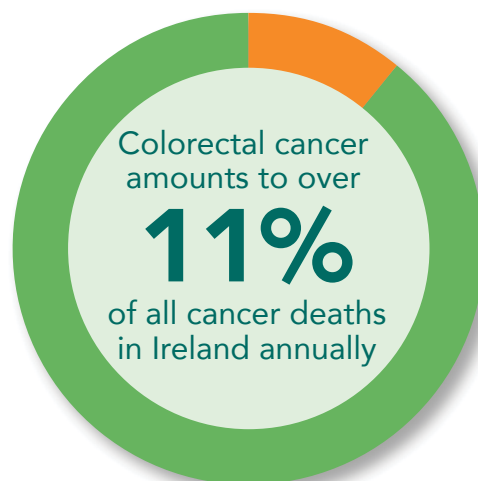
Cancer of the colon or rectum (bowel cancer) is the second most common cancer in men and the third most common in women in Ireland, with almost 2,500 cases diagnosed each year. Deaths from colorectal cancer account for over 11 per cent of all cancer deaths in Ireland annually<sup>1</sup>.

The number of new cases of colorectal cancer has increased in Ireland since 1994 and is expected to increase significantly over the next 10 years, due primarily to an ageing population and increasing life expectancy<sup>2</sup>. As the vast majority of these cancers are thought to arise from benign growths known as adenomas, it means that a screening programme that can detect these adenomas early will save many lives.

## Colorectal screening

The primary objective of colorectal cancer screening is to reduce mortality from colorectal cancer, in addition to identifying and removing pre-cancerous adenomas in the lining of the bowel, thereby making colorectal cancer preventable.

High participation in BowelScreen will lead to greater reductions in bowel cancer incidence, morbidity and mortality, as envisaged by the Health Information and Quality Authority's (HIQA) Health Technology Assessment (HTA) of a population based colorectal cancer screening programme in Ireland<sup>3</sup>. This will be most effective when the programme rolls out screening to the target age cohort of those aged 55 to 74. Overall the effect of screening will be to reduce the burden of disease on both individuals and the health system.



## Screening tool

As its primary screening tool, the programme has chosen the Faecal Immunochemical Test (FIT), which operates on an automated testing platform.

Ireland was one of the first countries to adopt this technology for organised population-based colorectal cancer screening. One of the advantages of using this test in a population-based screening programme, is that it can be self-administered in the privacy of the individual's own home.

No screening test is 100 per cent accurate; FIT will rely on a cancer or adenoma bleeding at the time of the test. Thus, there will be false negatives where the FIT is negative and a lesion is present, and alternatively, there will be false positives where the FIT is positive and a subsequent colonoscopy shows no significant cause. In some of these cases, it may be that the FIT detects blood from hernias or piles, rather than adenomas linked to cancer.

For the majority (approximately 95 per cent) of the population, the FIT will be the only test required. For a small minority (approximately 5 per cent), a further test (colonoscopy) at a hospital-based screening colonoscopy unit will be necessary. It is important in any screening programme that any client with a positive test is offered appropriate management in a timely fashion. After the first year of the programme, it became apparent that the sensitivity of the FIT was undermining the programme's ability to offer colonoscopies in a timely manner (i.e. the numbers being referred for colonoscopy were not manageable at hospital screening centres). Therefore, the sensitivity of the FIT was reduced, resulting in the variances of FIT positivity seen in the years 2014 and 2015, as outlined later in the report.

Interval cancers are defined as cancers presenting between screening rounds. Post Colonoscopy Colorectal Cancers (PCCRCs) are those occurring within three years of a normal colonoscopy. As a result of this time difference, BowelScreen will not be able to calculate the rate of interval and PCCRCs arising from the first screening round, for approximately another two years. BowelScreen has commenced discussions with the National Cancer Registry of Ireland to ensure data pertaining to interval cancers and PCCRCs are captured accurately.

## First screening round results

It is accepted that bowel cancer is a very treatable disease, if detected early. The evidence indicates that there is about a 90 per cent chance of living more than five years following diagnosis, if cancer is detected at Stage I of the disease<sup>4</sup>.

The clinical results for the first screening round are very encouraging. In its first screening round, BowelScreen invited 488,628 eligible people, screened 196,238 clients, performed 8,062 colonoscopies and detected 521 cancers. This represents a screening uptake rate of 40.2% and a cancer detection rate of 2.65 per 1,000 people screened.

In addition, approximately 13,000 adenomas or polyps were removed. These are abnormal tissue growths that can become cancerous at a later stage. The removal of pre-cancerous polyps greatly reduces the risks of future bowel cancer development. Furthermore, 676 sessile serrated lesions (SSLs) were detected. SSLs are flat pre-cancerous polyps that can develop to bowel cancer. They can be difficult to visualise at colonoscopy, which is why excellent bowel preparation is so important. The programme is one of the first international screening services to report on these lesions.

## Concluding remarks

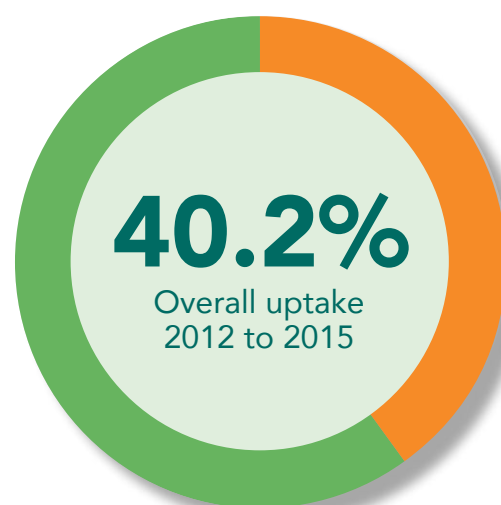
BowelScreen is providing an essential service to the Irish public and this could not be achieved without the dedication and professionalism of those individuals who work to ensure that services are delivered to high standards.

I would like to thank the Programme Evaluation Unit within the NSS for compiling the data contained in this report. I also wish to acknowledge the BowelScreen team, the IT Department and those who provide leadership and advice in the Executive Management Team meetings. In addition, I must extend my thanks to past and present members of our Clinical Advisory Group and Quality Assurance Committee, for their ongoing professional input and support.

Finally, it is critical to note that the colonoscopy element of the BowelScreen programme would not be possible without the magnificent input of the clinical nurse specialists in the colonoscopy screening centres and the expertise and dedication of the consultant endoscopists who carry out these, at times, complex procedures.

I am greatly encouraged that the additional support provided by the National Endoscopy Working Group of the HSE and the Department of Health will ensure that as the programme progresses and matures, BowelScreen will continue to save many more lives.

**Professor Diarmuid O'Donoghue,**  
Clinical Director,  
BowelScreen





# Message from the Programme Manager, BowelScreen

Since the establishment of BowelScreen, the NSS has made significant progress in developing the programme. Strategic planning for the development and implementation of BowelScreen is provided by the Executive Management Team and the Colorectal Operational Committee. These groups incorporate support from all of the NSS, including Programme Evaluation, Information Technology, Screening Promotion, Communications, Quality Assurance, Facilities, Human Resources and Procurement, as well as nursing and BowelScreen staff in Dublin, Cork and Kerry. The programme is dependent on maintaining and developing relationships with all of our hospital partner sites, nursing teams, managers, gastroenterologists, endoscopists, histologists, surgeons and computed tomography (CT) clinicians. I wish to acknowledge the work and dedication of all of these individuals, which has resulted in the establishment of this valuable lifesaving programme.

I also wish to recognise the contribution of BowelScreen laboratory providers, postal services and Freephone staff. Their dedication and professionalism have ensured that, during the first screening round, 500,000 invitation letters were issued promptly, along with the many thousands of reminder, recall, result and GP letters and that the 200,000 or so home testing kits were dispatched and analysed on time.

The second round of BowelScreen began in January 2016 and the data collected from round one will inform the future direction of the programme. The NSS is partnering with the Acute Hospitals Division of the HSE, the Department of Health and the National Treatment Purchase Fund to develop a national strategy for endoscopy services. BowelScreen is committed to working in partnership with this National Endoscopy Working Group to promote and drive service improvements across all hospital groups. The work streams identified by the group include developing plans for capacity and demand, standardised referral pathways, validation and scheduling, quality assurance and training.

This report demonstrates that BowelScreen is detecting and treating colorectal cancers and pre-cancerous changes at an early stage. There are continual improvements to be made, however these should not detract from the fact that the establishment of the programme has been a significant milestone in the improvement of cancer detection in Ireland.

**Thomas O'Brien,**  
Programme Manager,  
BowelScreen

# Programme History

## The establishment of BowelScreen as a screening programme for colorectal cancer was a complex and layered process.

In 2007, the Minister for Health and Children asked the former Board of the National Screening Service (NSS) to explore the potential for a national, quality-assured colorectal cancer screening programme in Ireland. Chaired by Professor Niall O'Higgins, an expert group evaluated the clinical and organisational elements required to introduce a programme and presented its first report to the Board of the NSS in December 2007.

An independent peer review of the report was sought from an international panel of experts in colorectal cancer screening including Professor Wendy Atkin and Professor Robert Steele (UK), Professor Jean Faivre (France) and Professor Michael O'Brien (USA). On completion of this review, the expert group submitted its final report to the Board of NSS, in October 2008.

The recommendations of the Board on the organisation and implementation of a national, population-based, quality-assured colorectal cancer screening programme were provided to the Minister for Health and Children in December 2008.

The Board requested the Health Information and Quality Authority (HIQA) to undertake a Health Technology Assessment (HTA) to measure the cost-effectiveness of the proposed programme. The report was published in March 2009 and its recommendations were incorporated into the development of the programme.

A significant aspect of the preparations for the introduction of the programme was the establishment of the NSS Quality Assurance (QA) Committee for Colorectal Screening. Its

purpose was to review international standards, recommend best practice, monitor and evaluate achievement of the recommended standards and monitor and support adherence by service providers.

As part of the BowelScreen programme, a Clinical Advisory Group was established, which provides support for ongoing clinical development of the programme, specifically to provide medical policy and clinical advice to the BowelScreen Executive Management Team (EMT).

In 2010, the NSS sought expressions of interest from all publicly funded hospitals that wished to be considered as a screening colonoscopy unit. Thirty one hospitals in total expressed an interest. The HSE, through the NSS, commissioned baseline assessment visits in those units. The visits were conducted by the NSS in partnership with representative professional bodies, including the Royal College of Physicians of Ireland, the Royal College of Surgeons in Ireland and the Joint Advisory Group on Gastroenterology (JAG) in the UK. All baseline visits were completed by September 2010 and hospitals interested in joining the programme received a follow-up review by the end of December 2010, with a view to attaining JAG accreditation.

The accreditation process was challenging and the 14 hospitals that have completed this should be very proud of this achievement. This ensured that from its inception, BowelScreen has set the highest standards for the programme to ensure that those taking part receive the best possible care.

# Programme Overview

## Background

The BowelScreen screening programme began in October 2012 with the aim of offering free screening to men and women aged 55 to 74, on a two-yearly cycle.

The purpose of BowelScreen is to identify the population most at risk of colorectal cancer and to target those most likely to benefit from early detection and treatment. Over time, full participation in the BowelScreen programme should result in a reduction in mortality from colorectal cancer and fewer patients requiring cancer treatment in hospitals.

The first cycle or 'round' was carried out over approximately three years from 1 October 2012 to 31 December 2015, starting with men and women aged 60 to 69. A catch-up for clients who were within this age bracket on the date the programme was launched allowed some screening participants, who were over 70 years old during the first round of the programme to be invited in this round. The programme will be expanded over time until the full 55 to 74 age group is reached. The maximum benefit in terms of reduction in mortality will occur only when the programme targets the full 55 to 74 age population.

## Quality assurance

Quality underpins every aspect of the BowelScreen programme. The National Screening Service (NSS) is committed to ensure that the screening programme is quality assured and there is adequate capacity in place, without impacting on the symptomatic service. Accordingly, BowelScreen works in close partnership with the hospital colonoscopy units to ensure this.

Prior to the launch of BowelScreen, the BowelScreen Quality Assurance (QA) Committee was formed, consisting of a multidisciplinary team of experts, drawn from the fields of endoscopy, radiology, histopathology, surgery and programme operation and administration. The QA Committee is responsible for the continuing oversight of quality within the programme. The committee's purpose is to review international standards, recommend best practice, monitor and evaluate achievement of the recommended standards and monitor and support adherence of the standards by service providers. The programme's performance is measured against key performance indicators (KPIs) as outlined in the Guidelines for Quality Assurance in Colorectal Screening (1st edition)<sup>5</sup>.

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*The maximum benefit in terms of reduction in mortality will occur only when the programme targets the full 55 to 74 age population.*

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The QA Committee reports to the BowelScreen Executive Management Team. To ensure continual adherence to quality assurance across every aspect of the BowelScreen programme, the written and auditable QA standards will be updated regularly to take into account changes in the environment, whether those changes are technological, operational or reflecting advances in clinical excellence.

## Communications and Screening Promotion

In developing the programme, the NSS carried out extensive research on colorectal screening programmes internationally and on awareness and understanding of colorectal cancer and screening in Ireland. This research consisted of three phases: global learnings, including barriers to participation and best practice case studies; branding and messaging of colorectal screening programmes; and consumer research, through focus groups, to test and validate the proposals. This research provided key evidence that informed the branding of BowelScreen and creative material.

Since the programme began in 2012, the NSS Communications Department has advertised BowelScreen widely across targeted press, radio, digital and social media and delivered communications initiatives to increase understanding of and participation in the programme. Consumer research shows that awareness and familiarity of BowelScreen are strong, at 85 per cent and 75 per cent respectively, with 82 per cent of respondents rating programme advertising as effective.

A BowelScreen website ([www.BowelScreen.ie](http://www.BowelScreen.ie)) has been developed to provide information to the public about the programme. The website includes a function where anyone can check the register to ensure that they are invited to participate when eligible. There is also a dedicated section for health professionals, which includes a function to verify that a patient is registered with the programme. To support communication, posters, flyers and a suite of information leaflets were developed.

In recognition of the high calibre of communications materials developed for the programme, BowelScreen was presented with a Crystal Clear MSD Health Literacy Award in the category of Best Health Promotion Project for the Home Test Kit instructions. The Awards represent an ongoing partnership between MSD and the National Adult Literacy Agency (NALA).

The Screening Promotion Team has been actively involved in promoting BowelScreen from the commencement of the programme. For the first screening round, the initial focus was on raising awareness of the programme among healthcare professionals and the screening population. Initial work involved establishing links with health professionals and relevant representative bodies to inform and educate. Through attendance at relevant national conferences and other events, engagement with health professionals resulted in practical feedback on how the programme was perceived and what small changes could be made to impact positively on uptake. An educational pack about the programme is also delivered to GP trainees and student nurses annually.

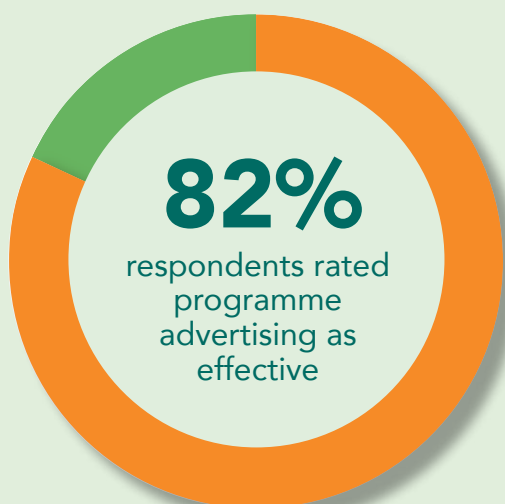
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To promote the programme widely to the screening population of 60 to 69 year olds, the Screening Promotion Team attended large events, such as the National Ploughing Championships and Over 50s shows. Particular focus was given to engaging with community groups and special interest groups, such as traveller representative organisations, HSE traveller health workers, the deaf population and a number of organisations working with persons with an intellectual disability. Engagement with these stakeholder groups provided important feedback on various issues, which were reported to the programme team, for consideration.

To address the specific issue of a lower uptake among men, the Screening Promotion Team commenced working with the Men's Health Forum in 2016, to highlight the issue of low uptake during Men's Health Week. As part of this campaign, BowelScreen linked with the Irish Pharmacy Union who arranged for 36,000 BowelScreen leaflets to be distributed to pharmacies nationally. It is intended to continue to engage with this important forum for men in the coming years.



Finally, an important focus going forward will be building close relationships with the new Leads for Health and Wellbeing within the HSE's Community Healthcare Organisations. This initiative aims to ensure that key HSE community-based staff will promote BowelScreen through the 'Make Every Contact Count' programme. These collaborations provide an invaluable platform for the delivery of focused screening promotion in general and in particular to the 'harder to reach' groups.

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# Programme Statistics

## Uptake

During its first screening round, BowelScreen invited 488,628 eligible people to participate in the programme and screened 196,238 people. This represents a screening uptake rate of 40.2% per cent.

There was an increase in both the number of people invited and the number of people screened over the first three years. The target uptake for the programme is greater than or equal to 50 per cent. While it is acknowledged that the actual uptake rate is not as high as

anticipated, uptake figures are reasonable given the recent establishment of the programme. As previously discussed, going forward, greater focus will be given to advertising and promotion of the programme and to identifying and removing perceived barriers to screening uptake.

Screening performance for the reporting period is shown in Table 1.

Table 1: BowelScreen screening performance 2012-2015

Performance Parameter	2012/2013	2014	2015	Total	QA Standard
Number of eligible clients invited	59,684	205,899	223,045	488,628	
Number of clients consented	27,164	87,595	92,494	207,253	
Number of FIT returns	25,775	83,228	87,437	196,440	
% FIT returns by consent	94.9%	95.0%	94.5%	94.8%	
Number of FIT satisfactory	25,749	83,118	87,371	196,238	
% Uptake	43.1%	40.4%	39.2%	40.2%	≥50%

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*During its first screening round, BowelScreen invited 488,628 eligible people to participate in the programme and screened 196,238 people.*

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## Uptake by gender and age-group

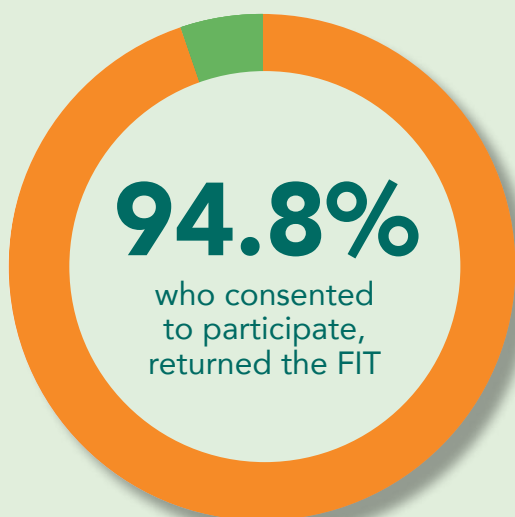
Uptake of screening for females was higher than in males (44.1 per cent compared to 36.4 per cent). The group with the highest uptake was females aged 65 to 69 years and lowest uptake was seen in males aged 70 years and over.

When making comparisons across age ranges, it should be noted that the percentage measures for over 70 year olds may be exaggerated due to the small numbers of this age group who were invited to participate.

Uptake of screening by gender and age for the reporting period is shown in Table 2.

Table 2: Uptake by gender and age-group 2012 to 2015

	Male 60-64	Female 60-64	Male 65-69	Female 65-69	Male ≥70	Female ≥70	Male Total	Female Total	Overall
No. eligible invited	79,087	72,573	154,327	144,465	18,436	19,602	251,901	236,727	488,628
No. screened	27,459	31,936	58,197	65,149	6,111	7,366	91,774	104,464	196,238
Uptake	34.7%	44.0%	37.7%	45.1%	33.2%	37.6%	36.4%	44.1%	40.2%



*Uptake of screening for females was higher than in males (44.1 per cent compared to 36.4 per cent).*

## BowelScreen Faecal Immunochemical Test (FIT) returns 2012-2015

As its primary screening tool, the programme uses the Faecal Immunochemical Test (FIT), which operates on an automated testing platform. The FIT test looks for blood in the stool sample provided and, if blood is detected, a colonoscopy is offered in one of the programme's accredited screening hospitals.

In early 2014, the programme adjusted the threshold for FIT from 100 ng haemoglobin/ml buffer to 225 ng/ml. In the two years following the adjustment, the FIT positive rate fell to 5

per cent and subsequently to 4.1 per cent, giving an overall FIT positive rate of 5 per cent for the first round of screening.

Of the total 196,440 FIT kits returned, a small number (202) were unsatisfactory and these individuals were offered a repeat test.

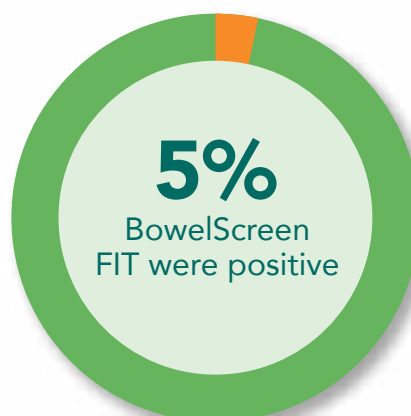
The results of the first round of FIT testing for clients invited during the period 1 October 2012 to 31 December 2015 is shown in Table 3.

**Table 3: BowelScreen Faecal Immunochemical Test (FIT) returns 2012-2015**

	2012/13	2014	2015	Overall	QA Standard
Number of satisfactory FIT returns	25,749	83,118	87,371	196,238	
% Satisfactory FIT by number returned	99.9%	99.9%	99.9%	99.9%	
Number of unsatisfactory FIT	26	110	66	202	
% Unsatisfactory FIT by number returned	0.10%	0.13%	0.07%	0.10%	≤3%
Number of FIT positive*	2,064	4,172	3,550	9,786	
% FIT positive of satisfactory*	8.0%	5.0%	4.1%	5.0%	
Number of FIT negative	23,685	78,946	83,821	186,452	
% FIT negative of satisfactory	92.0%	95.0%	96.0%	95.0%	

\* FIT threshold adjusted from 100 ng/ml buffer to 225ng/ml in early 2014

*Of the 196,440 FIT kits returned, a small number (202) were unsatisfactory and these individuals were offered a repeat test.*





## Colonoscopy

Colonoscopy is the first line investigation to assess the colon and rectum following a positive FIT result, as it enables examination, biopsy and subsequent histopathological diagnosis of abnormalities in the bowel, as well as identification and endoscopic removal of polyps and adenomas. As most bowel cancers develop from adenomas, their removal at colonoscopy provides a preventative measure that lowers the risk of the development of future bowel cancers.

Clients who receive a positive FIT result are contacted by a dedicated nurse from a BowelScreen accredited screening hospital for a pre-assessment, in order to establish their suitability for colonoscopy. This pre-assessment takes the form of a telephone interview enquiring about their general health, any co-morbidities and any medication they may be taking.

Over 82 per cent of clients with a positive FIT underwent colonoscopy at BowelScreen endoscopy centres (Table 4), which is below the programme target of over 85 per cent. However, taking just those clients who had a positive FIT and who were deemed suitable for colonoscopy, 94 per cent of that cohort of clients underwent a colonoscopy. Of the remaining 6 per cent, some clients may have chosen not to attend and others may have opted to undergo their procedure outside the programme.

The results of the first round of BowelScreen clients referred for colonoscopy during the period 1 October 2012 to 31 December 2015 are shown in Table 4.

**Table 4: BowelScreen client colonoscopy referrals**

	2012/13	2014	2015	Overall	QA Standard
Number of clients referred for colonoscopy	2,064	4,172	3,550	9,786	
Number of clients who completed pre-assessment	1,845	3,710	3,170	8,725	
Number deemed suitable for colonoscopy	1,816	3,644	3,119	8,579	
Number attending colonoscopy	1,703	3,438	2,921	8,062	
% Acceptance rate based on positive FIT	82.5%	82.4%	82.3%	82.4%	>85%
% Acceptance rate for colonoscopy based clients deemed suitable	93.8%	94.4%	93.7%	94.0%	

*As most bowel cancers develop from adenomas, their removal at colonoscopy provides a preventative measure that lowers the risk of the development of future bowel cancers.*

## Colonoscopy waiting times

In order to reduce unnecessary anxiety to screening participants and to facilitate timely investigation of positive (abnormal) FIT results, it is a programme standard to offer a colonoscopy within four weeks of pre-assessment confirming suitability for colonoscopy.

Providing access to colonoscopy services in a timely manner depends on many factors including demand for colonoscopy services, capacity and waiting list management protocols.

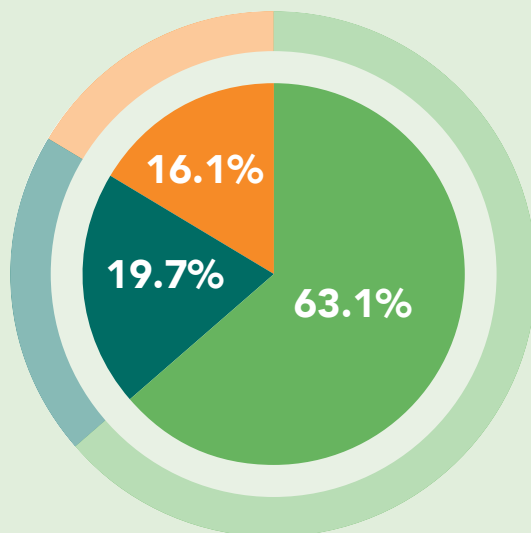
High waiting times posed a challenge to the programme over the first round of screening. The percentage of clients from the first screening round who were offered a colonoscopy appointment within four weeks

was 63.1 per cent, compared to the programme target of over 90 per cent. A further 19.7 per cent were offered an appointment within four to six weeks and over 16.1 per cent of clients had to wait more than six weeks for an appointment.

Demand pressures on symptomatic services reduce colonoscopy capacity, which has an impact on waiting times for clients referred from BowelScreen. While many of these issues are outside the control of the programme, continued efforts have been made to gain improvements in these waiting times.

Colonoscopy waiting times for screening participants are illustrated in Figure 1.

Figure 1: Colonoscopy waiting times - Round 1



**% offered appointment within 4 weeks**

**% offered appointment within 4-6 weeks**

**% offered appointment > 6 weeks**

## Bowel preparation

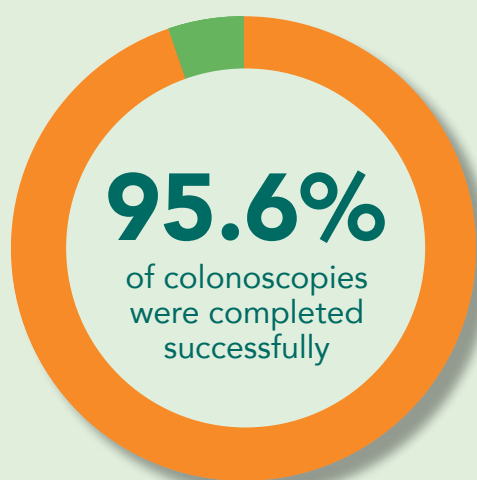
Over 8,000 clients presented for a colonoscopy at one of BowelScreen's 14 accredited hospitals. Effective bowel preparation is crucial to carrying out a colonoscopy, as it supports improved detection of adenomas or polyps, as well as caecal intubation. Poor bowel preparation is associated with failure to reach the caecum and hinders the detection of lesions.

Since BowelScreen began, there has been a sustained improvement in bowel cleanliness year on year. In general, bowel preparation was effectively carried out and colonoscopies could proceed. Reported adverse effects were low and well within guideline standards.

Colonoscopy performance is shown in Table 5.

**Table 5: Colonoscopy performance**

	2012/13	2014	2015	Overall	QA Standard
% Bowel cleanliness adequate or excellent	91.3%	92.9%	93.3%	92.7%	≥90%
Reported colonic perforation rate (per 1,000 colonoscopies)	0.59	0.87	0	0.50	<1 per 1,000 colonoscopies
Reported post-polypectomy perforation rate (per 1,000 colonoscopies)	0.59	0.29	0	0.25	<2 per 1,000 colonoscopies with polypectomy
% Post-polypectomy bleeding requiring transfusion (PPB)	0.00%	0.09%	0.05%	0.06%	<1%
% With colonoscopy complete	95.9%	95.0%	96.1%	95.6%	



*Over 8,000 clients presented for a colonoscopy at one of BowelScreen's 14 accredited hospitals.*

## Computed tomography colonography

On some occasions, it is not possible to carry out colonoscopy on a patient. In these instances the patient may be referred for a computed tomography (CT) colonography.

Of the 9,786 clients with a positive FIT, 271 clients were referred for CT colonography; this corresponds to 2.8 per cent of all FIT positive clients and is within the standard of less than 10 per cent.

Of those referred for CT colonography, 265 patients had the procedure performed and CT was completed in over 99 per cent of cases.

Colonography performance is shown in Table 6.

**Table 6: BowelScreen colonography performance**

	2012/13	2014	2015	Overall	QA Standard
No. clients referred to CT colonography	61	119	91	271	
% Clients referred to CT colonography following a positive FIT	3.0%	2.9%	2.6%	2.8%	≤10%
No. clients with CT performed	60	119	86	265	
% Clients with CT colonography performed within 30 days of referral*	88.3%	68.1%	89.5%	79.6%	≥95%
% Clients with CT colonography complete/adequate	98.3%	99.2%	100.0%	99.3%	≥95%
% CT colonography reports issued to programme within 15 working days of examination**	100.0%	97.5%	98.8%	98.5%	
% CT colonography reports issued to programme within 10 working days of examination	98.3%	93.2%	97.7%	95.8%	

\* This figure does not necessarily capture individuals offered appointments within the timeframe of 30 days but who deferred their appointment often due to travel distances, personal reasons, etc.

\*\* There is a minimum programme standard of ≤15 working days for report turnaround time after CT colonography examination.

*Of the 9,786 clients with a positive FIT, 271 clients were referred for CT colonography.*

# Histopathology findings

## Cancers detected

During the reporting period, 521 screening participants were diagnosed with bowel cancer following colonoscopy, resulting in a detection rate of 6.5 per cent post colonoscopy.

There were 355 colon cancers, 159 rectal cancers and seven cases of cancer where the site was unconfirmed, giving an overall cancer detection rate of 2.65 per 1,000 clients screened by the FIT.

Over 71 per cent of all cancers detected were stage I or II, meaning that they were detected at an early stage, when they could be more easily treated (Table 7).

In addition, over 1,300 screening participants were found to have advanced adenomas, multiple or large adenomas, corresponding to an adenoma detection rate of 54 per cent overall, which is well above the standard guideline of 40 per cent.

Histopathology outcomes during the first screening round are detailed in Table 7.

**Table 7: Histopathology outcomes during Round 1**

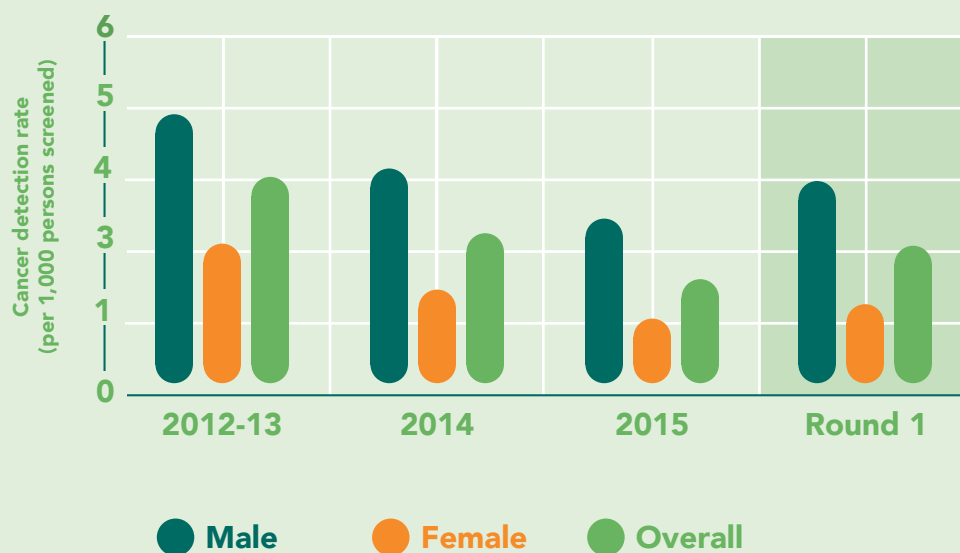
	Round 1 overall	QA Standard
No. cancers	521	
% Stage I and II	71%	
Adenoma detection rate	54%	>40%
No. clients with adenomas	4,369	
No. adenomas removed	12,983	
No. clients with advanced adenomas	1,353	
% adenomas with high grade dysplasia	5.6%	<10%
Sessile Serrated Lesions (SSL)	676	
% SSL with high-grade dysplasia	1.2%	

*There were 355 colon cancers, 159 rectal cancers and seven cases of cancer where the site was unconfirmed, giving an overall cancer detection rate of 2.65 per 1,000 clients screened by the FIT.*

The cancer detection rate among males was higher than females in each year, during the first round of screening. Higher cancer detection rates can be seen during the first year of the programme, compared to subsequent years and across all age groups. The higher cancer detection rates in the first year may be explained by the more sensitive (but less specific) FIT level employed in the early part of the programme. The FIT positivity threshold is subject to continual review in line with programme performance and capacity.

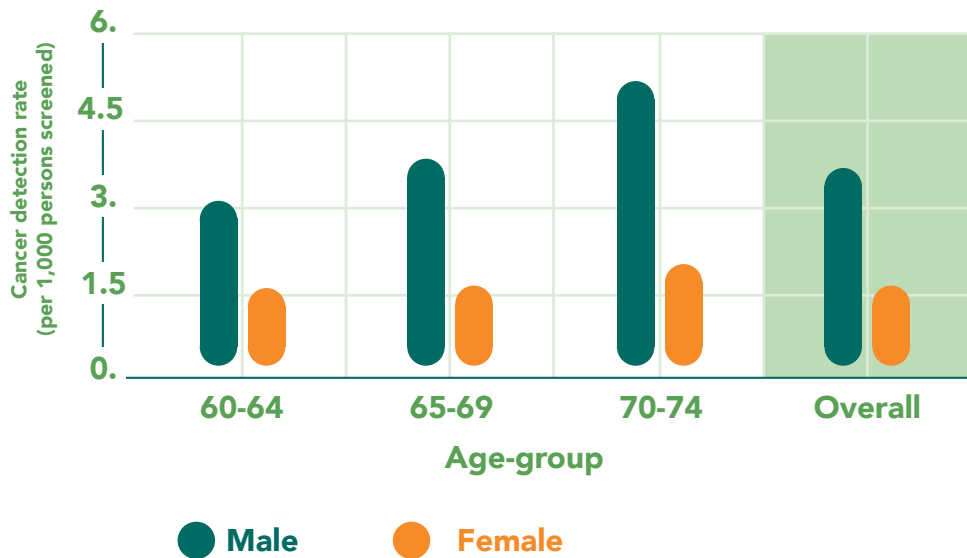
In addition, another factor which may have contributed to these higher detection rates is that screening was offered mainly to older clients in the first year. This is further supported by the data in Figure 3 which shows cancer detection rates increase with age.

Figure 2: Cancer detection rate (per 1,000 screened) by gender and year



*The cancer detection rate among males was higher than females in each year, during the first round of screening.*

Figure 3: Cancer detection rate (per 1,000 screened) by gender and age-group



### Adenoma detection

Approximately, 13,000 adenomas or polyps were removed during the first screening round. These are abnormal tissue growths that can become cancerous at a later stage. The removal of pre-cancerous adenomas greatly reduces the risks associated with future bowel cancer development. The most dangerous of these are known as advanced adenomas (AA). Advanced adenomas are defined as the finding of five or more small adenomas in the large bowel or one or more adenomas equal to or greater than 2 cm.

The purpose of BowelScreen is not only the detection of early asymptomatic bowel cancers, but also to find and remove AA.

During the reporting period, 1,353 screening participants had AA removed from their bowel, greatly reducing the possibility of subsequent cancer development. These individuals are offered further surveillance colonoscopies to detect and treat any adenoma recurrence at a later date.

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*The purpose of BowelScreen is not only the detection of early asymptomatic bowel cancers, but also to find and remove advanced adenomas.*

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# Conclusion

The publication of this report formally concludes the first round of the BowelScreen programme. There is much to celebrate with a number of key important outcomes delivered.

In summary, from 1 October 2012 to 31 December 2015:

- BowelScreen invited 488,628 eligible people for screening
- 196,238 people returned a satisfactory test, which resulted in a screening uptake rate of 40.2%
- Uptake of screening for females was higher than in males (44.1 per cent compared to 36.4 per cent)
- 8,062 clients attended for a colonoscopy
- 521 cancers were detected, giving an overall cancer detection rate of 2.65 per 1,000 people screened
- There were 355 colon cancers, 159 rectal cancers and seven cases of cancer where the site was unconfirmed
- Over 71 per cent of all cancers detected were stage I or II, meaning that disease was detected at an early stage and therefore, easier to treat
- In addition, approximately 13,000 pre-cancerous adenomas or polyps were removed.

The programme team remains resolutely focused on making continual improvements in both the quality of the programme and in other key areas of success, such as client uptake. Although, there remains a number of years before the programme is fully embedded and delivering to its maximum potential, it is clear from the results above that a strong foundation has been created, upon which to build further success.



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