Cancer Society
Te Kāhui Matepukupuku o Aotearoa

# Position Statement
# Bowel (colorectal[1]) screening

**The Cancer Society welcomes the introduction of the National Bowel Screening Programme (NBSP) and views this as a major milestone in cancer control in New Zealand. Population-based bowel screening will save lives and is cost-effective [1, 2]. The bowel screening programme is currently being rolled out across NZ and is expected to be completed by 2021. For details on which DHBs are currently offering bowel screening visit the timetoscreen.nz website[2]**

## Key guidelines: (intended audience: general public)

1. The NZ Cancer Society strongly recommends that all eligible New Zealanders (aged 60-74 years) take part in the National Bowel Screening Programme (NBSP) by completing a free FIT screening test **every two years**.

2. Anyone with **symptoms** of bowel cancer, including rectal bleeding, straining, change in bowel habit lasting for 6 weeks or more, an abdominal mass and/or persistent abdominal pain, should see a medical practitioner as soon as possible (and not wait for a FIT test to be sent to them)

3. People who have **bowel symptoms** and who have a **negative result on a FIT test** may still require further tests, and so should discuss their symptoms with their medical practitioner.

4. People who have had a relative **affected by bowel cancer** or who have had bowel cancer themselves are likely to need an individualised surveillance plan, possibly outside the National Bowel Screening Programme. They should discuss the best screening options for them with a medical practitioner, taking the NZ Guidelines Group[3] recommendations into account.

5. For average-risk **adults aged above 74 years** who are not eligible to take part in the National Bowel Screening Programme, the decision to screen should be individualised, taking into account the individuals' overall health, screening history and personal preferences. New Zealanders in this age group are encouraged to discuss screening with a medical practitioner.

6. Average-risk **adults aged below 60 years** who fall outside any of the screening guidelines are strongly encouraged to be aware of bowel cancer symptoms and discuss any concerns with their medical practitioner.

7. **Primary prevention:** New Zealanders of all ages are also encouraged to lower their risk of bowel cancer by maintaining a healthy weight, limiting consumption of alcohol, being physically active, not smoking, limiting consumption of processed and red meats, and eating a wide variety of grains, vegetables, fruit and beans [3, 4]

1 Bowel cancer (also known as colorectal cancer) refers to cancer of either the colon (large intestine) or the rectum, which are the lower parts of the gastrointestinal tract.
2 www.timetoscreen.nz/bowel-screening/about-the-national-bowel-screening-programme
3 The New Zealand Guidelines Group (2011). Guidance on Surveillance for People at Increased Risk of Colorectal Cancer. Available: www.health.govt.nz/system/files/documents/publications/colorectal-cancer-surveillance-guidance.pdf

# Programme recommendations: (intended audience: decision-makers)

1. **The eligible age range:** The Cancer Society supports the extension of bowel cancer screening to those aged 50-59 and to prioritise this among Māori and Pacific peoples, as a means of improving equity in the NBSP. We accept that at the present time there are insufficient resources to provide this. However, we strongly support efforts to increase colonoscopy capacity and call for a government commitment to roll out screening to these groups by a set time.

2. **Equity, early diagnosis and participation:** we strongly endorse efforts to recognise and diagnose bowel cancers at an early stage and the implementation of targeted, proven strategies to increase informed consent and participation in the NBSP, particularly among Māori and Pacific peoples. These population groups are more likely to present with advanced bowel cancer, have poorer bowel cancer survival and are traditionally underserved in NZ screening programmes [5, 6]. Māori participation in decision-making should be enhanced.

3. **Continuous monitoring and evaluation of bowel screening data:** The Cancer Society supports plans by the BSP to be responsive to programme data to ensure all quality standards are met [7]. We emphasise the importance of the following indicators in particular: (1) ensure that participation is equitable and high for all population groups and (2) ensure the time interval between completion of the FIT and receiving the result is within 10 working days, to minimise anxiety and potential contribution to stage of disease. We acknowledge capacity and cost constraints, but ideally would like to see the current wait time target for participants to receive colonoscopy after a positive FIT test reduced (as per international benchmarks [8]).

4. **Investment in colonoscopy services:** we support on-going investment in colonoscopy/ referral services as a priority so that the number of adenomas and early stage cancers detected is maximised, harms are minimised, and capacity can match demand. We call for transparency around the number of publicly funded colonoscopies by region, and regular reporting of wait times for people with positive FIT results, surveillance for people at increased risk, and assessment of symptomatic patients. Close monitoring of treatment access and quality is urged.

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# Key guidelines

## Introduction

New Zealand has one of the highest bowel cancer age-standardised incidence rates in the world [9]; it is currently the second most diagnosed cancer in men and women (3158 in 2015) and the second leading cause of cancer-related deaths in the country (1243 in 2015). Māori have lower but rapidly increasing age-standardised incidence rates and bowel cancer survival is poorer compared with non-Māori [2, 10, 11]. Fortunately, regular participation in bowel cancer screening is an effective means of reducing both incidence and death from bowel cancer through early identification and prompt treatment of benign polyps (adenomas) and early-stage cancers [12]. Bowel cancers are one of the most preventable cancers because they almost always arise from pre-cancerous polyps or adenomas over many years that may be removed if detected [13]. It is expected that the National Bowel Screening Programme will initially detect 500 to 700 bowel cancers per year if a target participation rate of 62% is met (9a).

## The National Bowel Screening Programme (NBSP)

Following a five-year pilot, a national population-based bowel screening programme began progressively phasing in across the country in 2017 and is expected to be fully implemented by 2021. Despite the huge burden of disease, New Zealand lags well behind many countries many of whom implemented organised bowel screening more than 10 years ago based on compelling evidence (Germany 2002, Taiwan 2004, Italy 2005, UK 2006, Scotland 2007, France 2008, Canada 2011, Netherlands 2014, Australia-partial roll-out in 2006).

Population-based bowel screening in New Zealand is managed through the National Bowel Screening Programme (NBSP), National Screening Unit, Ministry of Health. The NBSP website is available here: www.timetoscreen.nz/bowel-screening/. Information on bowel screening is provided in a variety of languages: www.timetoscreen.nz/bowel-screening/help-in-other-languages/

Men and women with **no obvious symptoms or diagnosis** of bowel cancer aged between 60 to 74 years will be invited for free screening every two years and will be sent a FIT test in the mail to their home. Registration to the programme is automatic for those who meet nationality and age requirements.

**Guideline 1** The NZ Cancer Society strongly recommends that all eligible New Zealanders (aged 60-74 years) take part in the National Bowel Screening Programme by completing a free FIT screening test every two years.

**Guideline 2** Anyone with symptoms of bowel cancer, (including rectal bleeding, straining, change in bowel habit lasting for 6 weeks or more, an abdominal mass and/or persistent abdominal pain) should see a medical practitioner as soon as possible (and not wait for a FIT test to be sent to them)

## Screening adults below 60 years

Among young New Zealanders, there has been a significant increase in the incidence of bowel cancer [14] that may be due to lifestyle and environmental factors, including physical inactivity and diet [15]. Despite this increase in young people, around 90% of bowel cancers occur among those aged 50 years and over [16]. This suggests that routine screening does not need to include this younger age group, but instead awareness of the need for further investigation should be enhanced among medical practitioners and young people with symptoms (i.e. suspected colorectal bleeding) and a family history of bowel cancer, to reduce delays in assessment and treatment. The threshold for requesting a colonoscopy in symptomatic young people should be lowered to take this trend in to account.

Effort should also be directed toward primary prevention – risk factors[4] for bowel cancer and protective factors[5] are well established. We support further studies to determine the cause for these trends and identify and implement proven preventive and early detection strategies among younger people.

**Guideline 3** Average risk adults aged below 60 years who fall outside any of the screening guidelines are strongly encouraged to be aware of bowel cancer symptoms and discuss any concerns with their medical practitioner.

## Screening adults aged above 74 years

For adults aged above 74 years who are not eligible to take part in the national screening programme, the decision to screen should be individualised, taking into account their preferences and overall health. Free bowel screening is not offered to asymptomatic New Zealanders aged 74+ as the benefit of early detection of and intervention for colorectal cancer declines after this age. The potential harms of colonoscopy in particular may outweigh the benefits [17]. However, we recognise that for some older average-risk New Zealanders, the decision to be screened may be appropriate and consideration should be given by the government to fund free FIT testing for those individuals. We also recognise that people in this age category most likely to benefit from screening are those who have not had a prior screening test.

Those aged above 74 years considering whether or not to have a FIT test should be provided with opportunity to discuss the benefits and harms of testing with a supportive screening-knowledgeable medical practitioner before making a decision.

**Guideline 4:** for adults aged above 74 years who are not eligible to take part in the national bowel screening programme, the decision to screen should be individualised, taking into account the patient's overall health and preferences. New Zealanders in this age group are encouraged to discuss routine screening with their medical practitioner.

## The bowel screening test ('FIT')

The screening test that is used is called the faecal immunochemical test (FIT). This test will be sent in the mail to the home address of age-eligible New Zealanders who will be asked to take a tiny sample from one stool and return the sealed test in the mail to a designated laboratory[6]. The FIT detects very small amounts of blood in stool samples that may be produced by adenomatous polyps (pre-cancerous lesions) or cancers in the large bowel, long before any symptoms develop. The test does not detect bowel cancer itself.

Most people will not have any (significant) blood detected in their samples – this is a **negative** result – and these participants will be routinely invited to repeat a FIT every two years. However, people with a negative result on a FIT test who have bowel cancer symptoms (including rectal bleeding, straining, change in bowel habit lasting for 6 weeks or more, an abdominal mass and/or persistent abdominal pain) may still require further tests, and so should discuss their symptoms with their doctor.

**Guideline 5:** people who have bowel symptoms and who have a negative result on a FIT test may still require further tests, and so should discuss their symptoms with their doctor.

4 Risk factors for bowel cancer include consumption of processed and red meats and alcoholic drinks, smoking and excess body weight

5 What decreases the risk of bowel cancer: physical activity, foods high in dietary fibre and wholegrains

6 How to do the National Bowel Screening test: www.timetoscreen.nz/bowel-screening/doing-the-bowel-screening-test/ (Ministry of Health/National Screening Unit)

A FIT test is **positive** if a significant amount of blood is detected in stool samples and participants are likely to undergo further tests (usually a colonoscopy). The presence of blood may be due to conditions other than cancer, such as polyps, haemorrhoids, or inflammation of the bowel, but the cause of bleeding needs to be investigated.

FIT is the choice of test for the majority of programmes worldwide due to high sensitivity, specificity, convenience, ease of use and cost-effectiveness compared with the earlier developed stool-based test, the guaiac faecal occult blood test (gFOBT) [18-21]. In randomised controlled trials, annual and biennial gFOBT was found to reduce bowel cancer mortality by 13-33% [22-24], but on the other hand, the gFOBT test is very non-specific. FIT has a greater sensitivity for detecting advanced adenomas and bowel cancer compared to gFOBT.

A screening programme evaluation of biennial FIT compared with gFOBT reported increased uptake, similar clinical outcomes, and good analytical reproducibility, and supported the use of FIT as a first-line screening test, even with limited colonoscopy capacity [25]. FIT utilises automated technology to screen for blood that is more accurate and less ambiguous once an appropriate cut-off limit for positivity is set. In addition, FIT has less stool sample requirements and ease of use of the test kit may improve participation in the programme compared with routine screening by flexible sigmoidoscopy [26] or colonoscopy [27].

### Follow-up of a positive FIT result

Those who receive positive results undergo further tests, usually a diagnostic colonoscopy, to investigate the cause of bleeding. In the bowel screening pilot, 5.5% -7.5% of participants had a test positive for the presence of blood requiring follow up [28]. Approximately 500-700 cancers each year may be detected based on a participation rate of 62% [29].

### Diagnostic colonoscopy

A colonoscopy involves the insertion of a flexible tube (with a small camera and light) into the rectum and colon by a health professional to examine on screen for any abnormalities. If a growth or polyp is detected, it may be removed. Sedation and bowel preparation, including cleansing is required. Colonoscopy is the gold standard diagnostic test in symptomatic patients [30].

### Computed tomographic colonography (CTC)

In a small number of cases, people with positive FIT results are unsuitable for colonoscopy and will instead undergo CTC, a non-invasive imaging investigation of the large intestine. NZ bowel screening pilot data indicates that CTCs made up less than two percent of all diagnostic tests performed following a positive FIT result [28].

The benefits of CTC imaging have been reported as outweighing the risks, which are rare and include exposure to radiation and colonic perforation (FDA). Reviews of CTC versus colonoscopy and barium enema (means of traditional imaging) report that CTC was more acceptable among the public and therefore may be recommended as an option for those unable or unwilling to undergo colonoscopy [30, 31]. However, people undergoing CTC who require a suspected lesion to be removed will need to be referred to colonoscopy or surgery, contributing to an already overburdened referral system [32]. For those people with symptoms of bowel cancer, CTC is similar in sensitivity to colonoscopy in detecting abnormalities [32].

CTC has also been proposed as a primary screening tool but at this time there is insufficient evidence to recommend CTC for this use.

## Benefits and risks of screening

### Evidence of benefit

The most obvious benefit is that more precancerous and early stage bowel cancers will be detected when they are easier to treat. Therefore, there may be less invasive treatment, fewer deaths and longer better-quality lives for some people diagnosed by screening, with less bowel cancer related suffering and disability.

### Potential harms

Potential harms associated with use of the FIT screening test among adults include anxiety and false-positive results (unnecessary investigation) and false-negatives leading to false reassurance (missed cancers). The majority of harms result from the use of diagnostic colonoscopy following a positive FIT, including discomfort during the test and a low but potential risk of bowel perforation. Estimates suggest there are about 4 colonic perforations and about 8 major intestinal bleeding episodes per 10,000 screening colonoscopies performed. The rate of serious adverse events from colorectal screening increases with age (36).

## Alternative routine screening tests

These tests are currently not used in New Zealand but some may be considered for inclusion in the bowel screening programme in the future.

Along with FITs, there are several accepted screening options that can reduce bowel cancer mortality including colonoscopy (by 68-88%); the older generation FIT test – the guaiac-based faecal occult blood test [gFOBT] (by 13-33%)[12, 33, 34]; and flexible sigmoidoscopy (by 21-31%) [35-39].

Stool DNA tests (plasma DNA and multitarget Faecal DNA testing) [40, 41], and computed tomographic colonography (CTC) [42] have also been assessed but less is known about their accuracy as a screening tool. Each test differs in the way they are used and they have different risks and benefits. Barium enema is no longer recommended because of low sensitivity of only 48% [43].

### Colonoscopy as a primary screening test

Colonoscopy is now used as part of the bowel screening programme in countries including Germany and the United States (every 10 years). Despite low participation, quite substantial reductions in bowel cancer incidence have been modelled and reported in Germany [36, 44]. The test is highly sensitive and specific; offers a definitive examination and removal of precursors and is relatively safe. However, there are still some doubts about the use of colonoscopy use as a primary 'first-line' screening tool in the asymptomatic population. Contrary to the requirements defined by the WHO screening criteria, there is a lack of trial evidence demonstrating a reduction in mortality from a colonoscopy screening program (though these are underway) and it is not a simple test widely accepted by populations screened [44]. Furthermore, colonoscopy requires a skilled examiner, is less convenient, involves bowel preparation and sedation, involves a greater cost and has more risk for people compared with non-invasive screening tests. Colonoscopy resources are already at capacity in NZ.

### Flexible sigmoidoscopy (FS)

FS involves the insertion of a flexible tube with a camera and light in to the distal colon to screen and remove precancerous polyps. Less bowel preparation is required compared with colonoscopy. Whereas colonoscopy involves examination of the entire colon, sometimes an examination of the last third of the colon is warranted, and this is when an FS will be recommended. FS is now used as part of the UK bowel screening programme – a one-off FS is offered to 55-year olds along with FIT– on the basis of compelling evidence showing a significant reduction of 21% incidence and 26% reduction deaths from bowel cancer [39]. However, FS is limited to detecting cancer in the distal colon and generally is considered less cost-effective than FIT. A combination of FIT and flexible sigmoidoscopy offers high health gains but is expensive (28a).

### Stool DNA testing

Multi-target stool DNA tests (mt-sDNA) detect altered DNA and blood released from precancerous and cancerous lesions of the colon. Specimens may be collected at home and no bowel preparation or dietary and medication restrictions are required. Two large case control studies have reported that this screening test is very accurate at detecting early stage colorectal cancer and large adenomas throughout the colorectum [45, 46]. The stool DNA test has the same sensitivity as colonoscopy in detecting early stage colorectal cancer and is more accurate than the FIT in detecting cancers (93% vs 74%), pre-cancerous lesions and polyps and was

approved by the US FDA in 2014. Unlike the left-sided detection bias noted with FS and colonoscopy, faecal DNA testing detected neoplasms throughout the colorectum equally well. Testing is automated.

Stool DNA testing is non-invasive test and may be completed at home. Diagnostic colonoscopy is required if the test is positive.

# Programme recommendations

## Expanding the eligible age range

The eligible commencement age of the NZ bowel screening programme is 60 years. However, most countries screen for bowel cancer starting at age 50 because there is a steep increase of bowel cancer beginning at this age. Many cancers may be avoided or detected early by screening this age group. NZ Cancer registration data indicates that of 9,667 new diagnoses of bowel cancer in 2014-2016, 38% (n=3667) occurred in individuals aged 60-74; and 12% (n=1204) occurred in people aged 50-59 years [16]. Because the chances for cure are much higher in earlier compared to later stages and there is a steep increase in risk beginning at around 50 years, we consider that those aged 50-59 should also be invited to participate in the BSP.

**Recommendation 1:** The Cancer Society supports the extension of bowel cancer screening to those aged 50-59, with priority given to Māori and Pacific peoples. We accept that at the present time there are insufficient resources to provide this. However, we strongly support efforts to increase colonoscopy capacity and call for a government commitment to roll out screening to this group by a set time.

There has been some debate about the potential for reducing colorectal cancer inequities by prioritising a lower eligible age range among Māori and Pacific peoples (beginning at age 50 years). The Cancer Society supports this key strategy to limit bowel cancer inequities. Although age standardised incidence rates for colorectal cancer are significantly lower among Māori men (SRR 0.71, 95%CI 0.64-0.78) and Māori females (SRR 0.63 95%CI 0.56-0.70) than non- Māori, this gap is decreasing over time [47]. Careful monitoring is needed to ensure that screening investigations and treatment are not exposing Māori (<60 years) to unnecessary harms.

Along with widening the screening age, the Cancer Society also supports investment in resources toward ensuring Māori and Pacific participation in decision-making and the implementation of targeted, proven strategies to increase informed consent and screening participation among age eligible Māori and Pacific peoples.

Concerted efforts to increase participation of age eligible Māori and Pacific peoples in the bowel screening programme and identifying those at high risk is essential to reduce the burden of bowel cancer. In the bowel screening pilot, Māori and Pacific people were much less likely to participate in screening and more likely to present with advanced bowel cancer and as a result survival is poorer [48]. The

focus should therefore be placed on identifying Māori and Pacifika who are at high risk (i.e. with family history or with bowel symptoms), in addition to improving screening participation. This would involve a concerted effort to identify, recruit and follow-up Māori and Pacific participants and improve access and care to relevant health services.

**Recommendation 2:** ensure the implementation of targeted, proven strategies to increase informed consent and bowel screening participation among Māori and Pacific peoples – population groups traditionally underserved in NZ screening programmes and with poorer bowel cancer survival. Māori and Pacific participation in decision-making should be enhanced.

**Recommendation 3:** we strongly endorse efforts to recognise and diagnose bowel cancer at an early stage, particularly in Māori and Pacific people.

## Strategies to improve participation among under-screened groups

The NZCS supports targeted efforts to increase participation among groups traditionally under-screened in population-based cancer screening programmes (i.e. Māori and Pacific peoples [6, 28], people living in deprived areas [6, 28, 49], populations with low health literacy [50] and people with disability [51]), through a combination of proven strategies. These include mail-based strategies (i.e. repeated invitations), targeted mass and small media social marketing campaigns, endorsement or reminders by primary health practitioners and support by community health workers, and community-based, culturally-appropriate health education programmes [52-55].

## Programme monitoring and evaluation

The Cancer Society supports plans by the NBSP to establish independent monitoring and evaluation of the NBSP, (as with other NZ population screening programmes), using identified quality standards and performance indicators [56] and to be responsive to this data. We endorse the proposed indicators detailed in the NBSP Interim Quality Standards [7], particularly the intention to carefully monitor Māori and Pacific participation rates. The Cancer Society also highlights the importance of monitoring and ongoing refinements of the standards relating to: (a) colonoscopy wait times, (b) the time interval between completion of the FIT, and (c) the FIT threshold.

## Time interval for receiving the FIT result

We support efforts to ensure the time interval between completion of the FIT and receiving the result is within 10 working days. This will minimise anxiety and potential contribution to stage of disease.

## Colonoscopy wait times

It is important that wait times for colonoscopy following a positive FIT are not delayed so that stress and anxiety are minimised and where cancer is present, it is diagnosed quickly. Delays in diagnosis (with cut-off times ranging between 116 days and 8 months) are associated with poorer outcomes, including overall mortality and late stage disease at diagnosis [57-60].

The NBSP Interim Quality Standards state that the first offered colonoscopy appointment is within 45 days of a positive FIT result being received by the NBSP and IT system. However, international benchmark wait times recommend no later than 31 days of referral [8]. This benchmark should remain a priority.

## FIT threshold

The FIT allows quantitative analysis of stool blood content so the screening programme is able to adjust the level to provide an acceptable threshold for further investigations without placing too much pressure on the limited capacity of colonoscopy services. Frequently used cut-off points in overseas programmes are 20, 50 and 100 µg/g (100, 250, and 400 ng/mL respectively)[61]. In New Zealand, the FIT threshold for the BSP has been set at 40ug haemoglobin/gram dried faeces (or 200ng Hb/ml buffer solution) which is projected to result in 7% of participants receiving a positive result (at 62% participation), but not overwhelming colonoscopy services. We note studies of programmes worldwide have shown that defining a positive FIT result with a cut-off value of 20 µg/g provided high sensitivity, specificity, and PPV for detecting neoplasia [62]. Other studies reported a decline in specificity with cut-off values below 20 µg/g using different Hb thresholds. As research indicates, we support flexibility in threshold adjustments to yield a desired PR (a proxy indicator for specificity)

**Recommendation 4:** The Cancer Society supports plans by the BSP to continue to be responsive to programme data to ensure quality standards are met and the appropriate FIT threshold for positivity is detecting pre/cancers and not placing too much strain on referral services.

## Role of the NZ Cancer Society in bowel screening

The Cancer Society considers that we have a role in promoting informed consent and enabling uptake among eligible populations – particularly among those underserved. We will continue to advocate for a gold standard bowel screening program that will best serve New Zealanders. We encourage research into reasons why at risk New Zealanders do not take up the invitation to screen.

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**This position statement was reviewed by the following Cancer Society Committees:**

**The Cancer Society of NZ National Health Promotion Advisory Committee (NHPAC)**

**The Cancer Society of NZ National Finance and Risk Advisory Committee (NFRAC)**

**The Cancer Society of NZ National Executive Committee (NEC)**

**The Cancer Society National Board**

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**Disclaimer: expert reviewers are not responsible for the final content of position statements. Views may vary.**

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