

4 The Strategic Case

4.1 Strategic Context

Organisational overview

The Ministry of Health is responsible for improving the wellbeing and health of New Zealanders, through the delivery of services that are accessible, safe, individual, family-centred, clinically and cost effective. The Ministry's priorities are:

- To contribute to the Government's strategic priorities (including delivering Better Public Services);
- To deliver the Government's cross-sector priorities in the health and social sector arena (including health targets);
- To implement the Minister's objectives for the sector (including maintaining wellness for longer by improving prevention, improving the quality and safety of health services, supporting the health of older people and supporting regional and national collaboration).

Most of the day-to-day business of the health system, and around three quarters of the funding, is administered by DHBs. DHBs plan, manage, provide and purchase health services for the population of their district to ensure services are arranged effectively and efficiently for all of New Zealand. This includes funding for primary care, hospital services, public health services, aged care services, and services provided by other non-government health providers including Māori and Pacific providers. Funding for the DHBs is agreed through the Crown Funding Agreement (CFA) in place between the Minister of Health and DHBs.

Services for Bowel Cancer

All DHBs provide colonoscopies as a diagnostic tool to detect bowel cancer (and other bowel disorders), in people referred with symptoms. DHBs also provide surveillance/follow up colonoscopies, for people at increased risk of colorectal cancer. DHBs provide treatment services for people with bowel cancer, including surgery, oncology, and provide or fund palliative care.

Screening Services






The National Screening Unit (NSU) within the Ministry of Health is responsible for the development, management and monitoring of nationally-organised population-based screening in New Zealand. Existing screening programmes include Breast cancer, cervical cancer, HIV testing in pregnancy, antenatal screening for Downs Syndrome and other conditions, newborn metabolic and newborn hearing loss.

Bowel Screening (including oversight of the Waitemata Pilot and planning for a national rollout of screening) currently sits within the National Cancer Programme. Both NSU and the Cancer Programme are within the Service Commissioning Business Unit. The programme SRO is the Director of Service Commissioning, ensuring strong linkages between the two groups. There is a close working relationship with the National Screening Unit (NSU), which is part of the programme governance structure. As a new initiative that requires a focus wider than screening (particularly improving symptomatic colonoscopy wait times and quality, plus linkages with the Faster Cancer Treatment programme), the National Cancer Programme was seen as the most appropriate team to implement this new programme of work.

Alignment to existing strategies

The alignment of the proposed investment in a national bowel screening programme with key strategies and guidelines is summarised in Table 6.

Table 6: Alignment of a National Bowel Screening Programme with Key Strategies and Guidelines

Strategy	Investment Delivers
<p>New Zealand Health Strategy 2016</p> 	<p>The New Zealand Health Strategy 2016 proposes five strategic themes for health services, including people powered, closer to home, value and high performance, one team, and smart system.</p> <p>The investment would:</p> <ul style="list-style-type: none"> • support Action 8 (to Develop and implement a health outcome-focused framework) by increasing the effort on prevention, early intervention, rehabilitation and well-being for long-term condition such as...cancer....addressing common contributors or risk factors of these conditions and focusing efforts on points in the lifecourse with the greatest opportunity for success. • support the theme of closer to home, focussing on prevention through a population-based initiative. Improve health outcomes cost effectively.
<p>Faster Cancer Treatment Programme</p> 	<p>The programme focus is to reduce waiting times for appointments, tests and treatments and standardise care pathways for cancer patients, wherever they live.</p> <p>The investment in a national screening programme would:</p> <ul style="list-style-type: none"> • enable early detection of bowel cancer, reducing demand for some cancer treatment services including major surgery, chemotherapy and radiotherapy. • support the key initiative of promoting nationally coordinated and consistent levels of service provision across the country. • support achievement of the Faster Cancer Treatment Health Target and Policy Priorities.
<p>New Zealand Cancer Plan 2015-2018</p> 	<p>The New Zealand Cancer Plan 2015-2018 vision is better, faster cancer care, with the aim of ensuring that all people have timely access to excellent cancer services that will enable them to live better and longer.</p> <p>The investment would:</p> <ul style="list-style-type: none"> • meet the expectation that more people across all population groups would be screened for bowel cancer and that referral processes would be streamlined. • provide streamlined, faster and more standardised diagnostic and treatment processes.
<p>New Zealand Cancer Information Strategy</p> 	<p>The New Zealand Cancer Information Strategy has three Strategic Objectives: to improve the quality of clinical information relevant to the cancer pathway; Improve quality of service delivery information relevant to the cancer pathway; and Improve quality of information to cancer patients.</p> <p>The investment would:</p> <ul style="list-style-type: none"> • enable complementary data sets to provide a more complete picture of cancer treatment and outcomes. • drive an improvement in the quality of clinical information, by improving data capture and quality.
<p>Statement of Intent 2015-2019</p> 	<p>The Statement of Intent has seven Impacts. The investment would support Impact 3: The public can access quality services that meet their needs in a timely manner, where they need them.</p> <p>The investment would:</p> <ul style="list-style-type: none"> • achieve the aim of extending the four-year bowel-screening pilot in the Waitemata DHB region and improving colonoscopy services. • support the implementation of the Cancer Health Information Strategy.
<p>Screening to</p>	<p>The National Bowel Screening Programme:</p>

Improve Health in NZ National Health Committee 2003	<ul style="list-style-type: none"> • Meets the eight assessment criteria recommended by the National Health Committee (NHC) for New Zealand screening programmes. • Implementation planning aligns with the four principles the NHC considered important in deciding on health services in New Zealand: effectiveness, efficiency, equity and acceptability.
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4.2 The Need for Investment

Bowel Cancer Morbidity and Mortality

New Zealand has one of the highest rates of bowel cancer in the developed world. When compared with other OECD countries, in 2011 (the latest year for which final figures are available for this comparison), New Zealand had the fifth highest rate of colorectal cancer mortality¹⁴ (see Figure 1). Almost every other similar OECD country has population-based bowel screening. Other countries with comparable service delivery models have built their own bespoke IT systems to meet the needs of their Programmes.

The development of bowel cancer is preventable in many cases and is highly treatable when identified in the early stages. The high cancer mortality rates in New Zealand are, therefore, amenable to change.

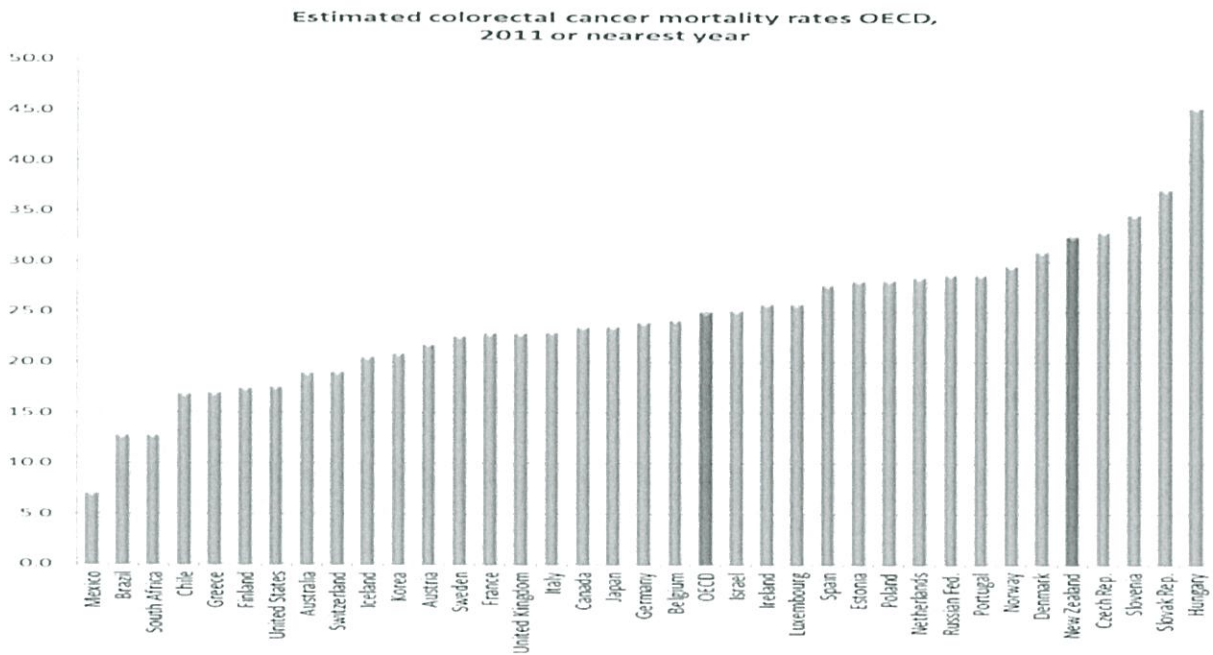


Figure 1: Estimated colorectal cancer mortality rates, OECD, 2011 or nearest year

Source: OECD Health Statistics 2013, <http://dx.doi.org/10.1787/health-data-en>

Between 2003 and 2012, the registration rate (the number of people diagnosed and registered on the National Cancer Registry) showed a slight downward trend, as shown in Figure 2. The trend may be due to changes in dietary habits or physical activity levels. However, the recent increase in obesity prevalence may impact on this trend in future¹⁵.

¹⁴ Colorectal cancer is a group of cancers, most commonly defined as cancer of the colon, rectum and anus. In some situations, anal cancers are not included in this grouping. Unless otherwise stated, colorectal cancer refers to the group of cancers that includes anal cancers, that is ICD10 Codes C18, C19, C20 and C21.

¹⁵ Ministry of Health 2002 Cancer in NZ: [Trends and Projections](#)

Colorectal cancer registration rates, trend over time, by sex

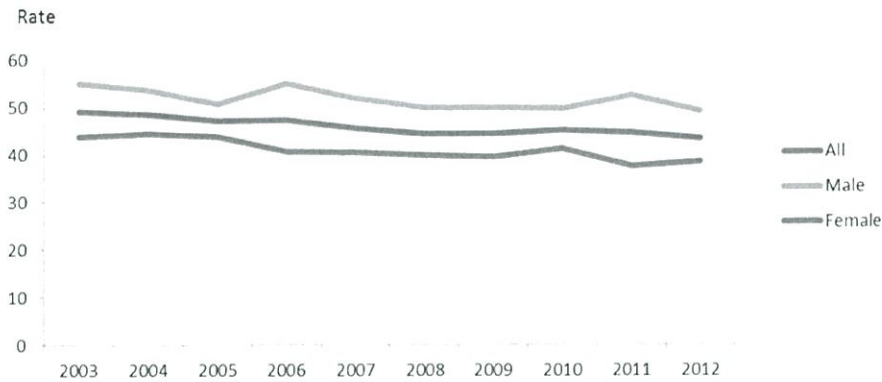


Figure 2: Colorectal cancer registration rates, trend over time, by sex

Source: New Zealand Cancer Registry

Note: rates are expressed per 100,000 population and age-standardised to the WHO World Standard Population

In 2012, colorectal cancer was the third most commonly registered cancer in New Zealand, with 3016 people registered. This accounted for 13.8 percent of all cancers registered, with only prostate and breast cancer being more common. When expressed as a rate, the 3016 registrations in 2012 equate to a value of 43.5 registrations per 100,000 population. In the same year, there were 1,283 deaths from colorectal cancer in New Zealand, a rate of 17.4 deaths per 100,000 population (age standardised). Colorectal cancer was the second most common cause of cancer death (after lung cancer), accounting for 14.4 percent of all cancer deaths. The most commonly registered cancers in New Zealand are shown in Figure 3.

The most commonly registered cancers by sex, 2012

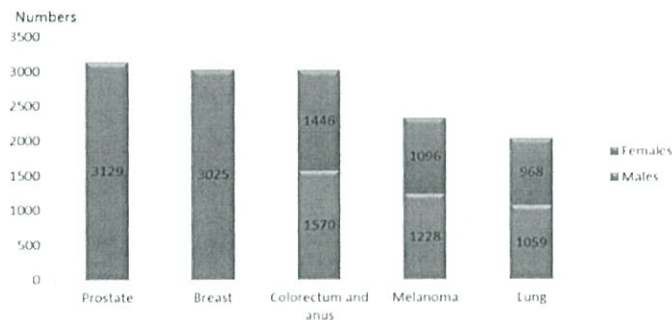


Figure 3: NZ most common cancers by sex, 2012

Source: New Zealand Cancer Registry

New Zealanders with bowel cancer are more likely to be diagnosed with advanced cancer stages than people in Australia, the United States and the United Kingdom. Death rates due to bowel cancer in New Zealand are 35 percent higher than in Australia for women and 24 percent higher for men¹⁶. There is a strong association between the stage at which bowel cancer is diagnosed and survival rates. Those with localised disease at diagnosis have a 91 percent chance of a five-year survival, whilst those with distant spread (metastases) have only an 11 percent five-year survival rate. Screening has been found to have a significant impact on stage of cancer at detection. The New Zealand PIPER study¹⁷ showed that only around 40 percent of colon cancers are detected at a localised stage (stages I and II) in a population without a screening programme. Of the cancers found in the BSP, 63 percent¹⁸ were found at the localised stage.

¹⁶ The PIPER Project Final report 7 August 2015, Health Research Council reference: 11/764

¹⁷ The PIPER Project Final report 7 August 2015, Health Research Council reference: 11/764

¹⁸ Ministry of Health Interim Evaluation Report of the Bowel Screening Pilot: Screening Round One 24 February 2015

Latest New Zealand information shows that relative five-year survival¹⁹ for people diagnosed with colorectal cancer was approximately 63 percent in the period 2010-2011 and that this value has changed little between 1998 and 2011, as shown in Figure 4.

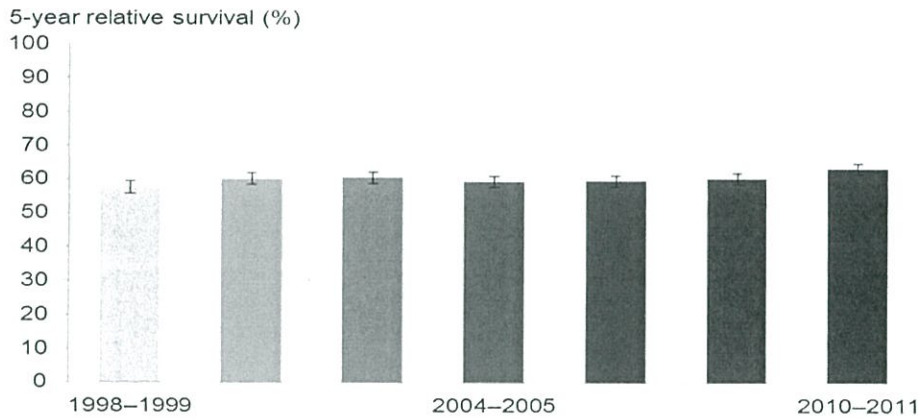


Figure 4: Colorectal cancer 5-year relative survival, total population, 1998-2011

Source: Ministry of Health 2015: New Zealand Cancer Registry, New Zealand Mortality Collection

Inequalities in Bowel Cancer

Whilst bowel cancer is a significant cause of ill health and death, there are notable variations within the New Zealand population:

- **Age:** Bowel cancer incidence increases with age, with 94 percent of cases occurring in those aged 50 or over and 82 percent in those aged 60 and over. The number of new cases of bowel cancer each year is projected to increase by 15 percent for men and 19 percent for women²⁰ due to population increases. However, when population changes are taken into account, there is a slight downward trend in rates. The age distribution of colorectal cancer is shown in Figure 5. Survival is marginally better for younger people with colorectal cancer, as shown in Figure 6.

Average number of annual colon and rectal cancer registrations by age and sex
2010-2012 average

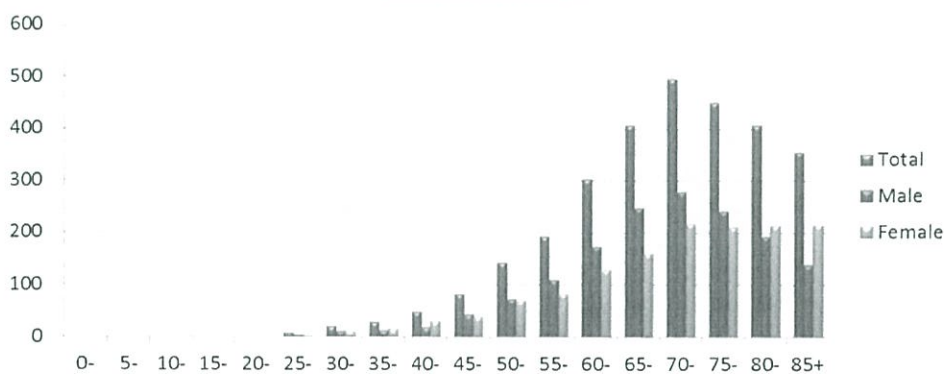


Figure 5: Colorectal Cancer Registrations by Age and Sex

Source: Ministry of Health 2015: New Zealand Cancer Registry

¹⁹ Relative survival is the observed survival in the cancer patient group divided by the expected survival of a comparable group from the general population. The patient group and general population group are matched, where applicable for sex, age, year and ethnic group. Relative survival reflects the excess mortality experienced by patients diagnosed with cancer.

²⁰ Ministry of Health [Interim Evaluation Report of the Bowel Screening Pilot: Screening Round One](#) 24 February 2015

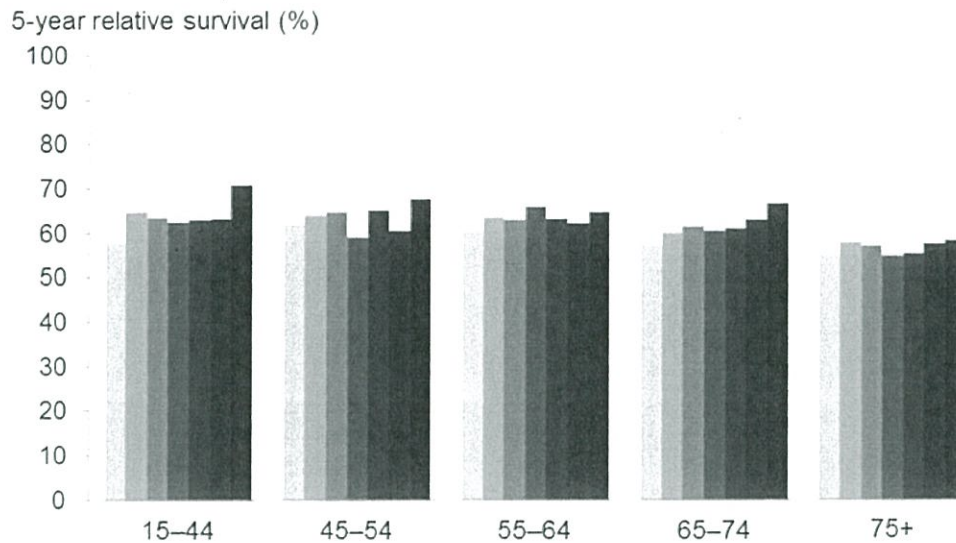


Figure 6: Colorectal cancer 5-year relative survival, by age group, 1998-2011

Source: Ministry of Health 2015: New Zealand Cancer Registry, New Zealand Mortality Collection

- Gender:** Worldwide, colorectal cancer is more common in men than in women and this is true in New Zealand, as shown in Figure 7. It is the second most common cause of cancer death for men after prostate cancer and the second most common cause for women after breast cancer (see Figure 3 above). Historically, the colorectal cancer rates in New Zealand women have been higher than for women in any of the other 32 countries within the international screening network.²¹ Women have a better 5-year net survival than men (see Figure 8), but the difference is not statistically significant. The gender gap widened between 1999 and 2011.

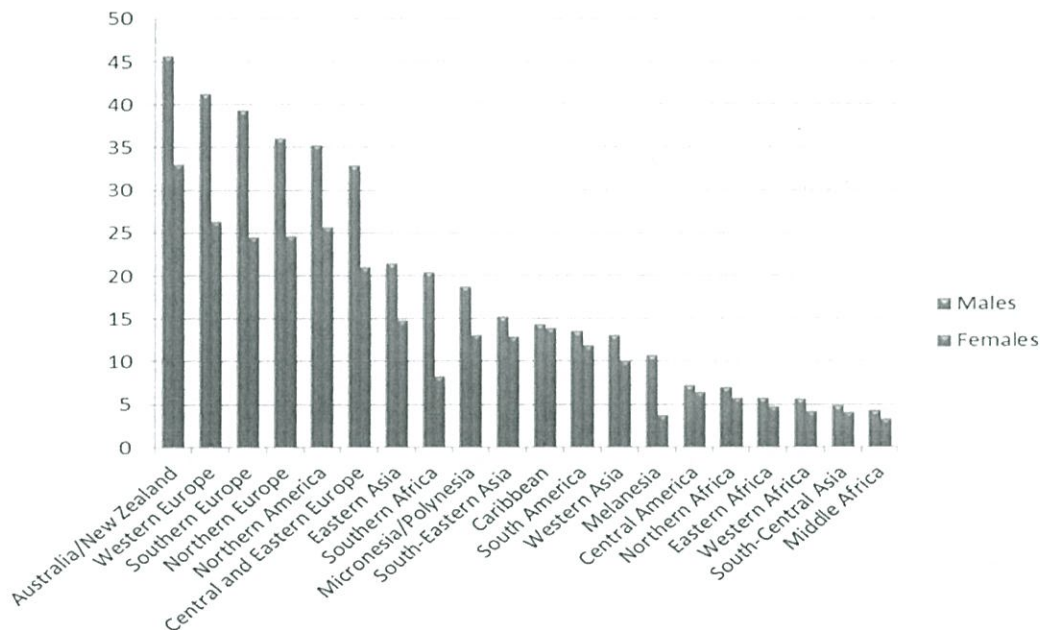


Figure 7: Age-standardised colorectal cancer incidence rates by sex and region of the world, 2011

Source: Source: Jemal et al. Global cancer statistics. CA Cancer J Clin 2011;61:69-90

²¹ [Surveillance of people at increased risk of colorectal cancer](http://www.bpac.org.nz/BPJ/2012/may/colorectal.aspx), <http://www.bpac.org.nz/BPJ/2012/may/colorectal.aspx>, referencing National Cancer Institute. International Cancer Screening Network, <https://appliedresearch.cancer.gov/icsn/olorectoal/mortality.html> (accesses May 2012)

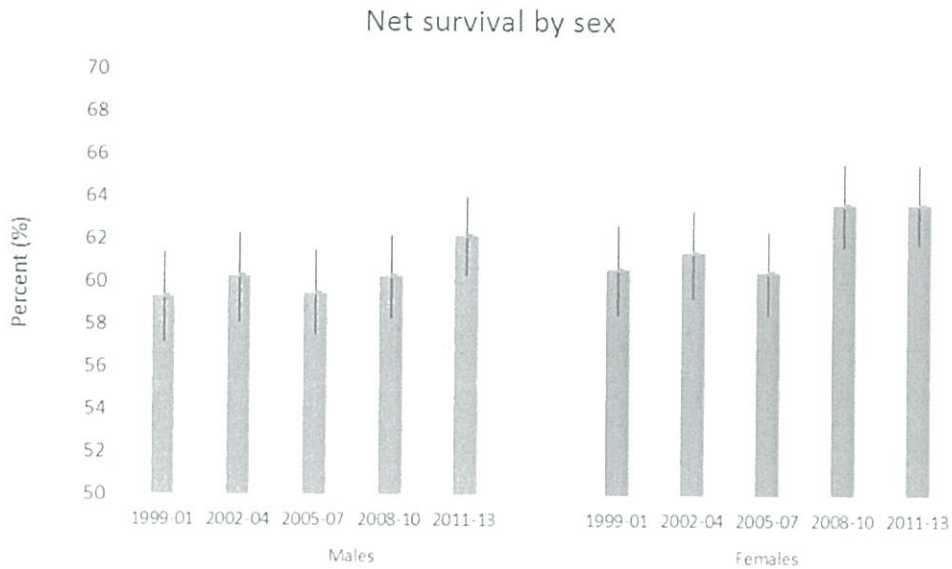


Figure 8: Net survival at 5 years, by sex

Source: New Zealand Cancer Registry

- **Ethnicity:**

- *Incidence:* Incidence rates (measured by registration rates) of colorectal cancer vary between population groups. Rates of colorectal cancer in the Asian population are lower than for other ethnicities, with 18.3 per 100,000 population in 2012. Pacific people experienced a rate of 27.0 and Māori a rate of 33.3 per 100,000 population. Those in other population groups showed a rate of 45.3 registrations per 100,000 population. The registration rates shown in Figure 9 highlight the variation between Māori and non-Māori, with non-Māori males and females having registration rates approximately 10 percent higher than Māori.

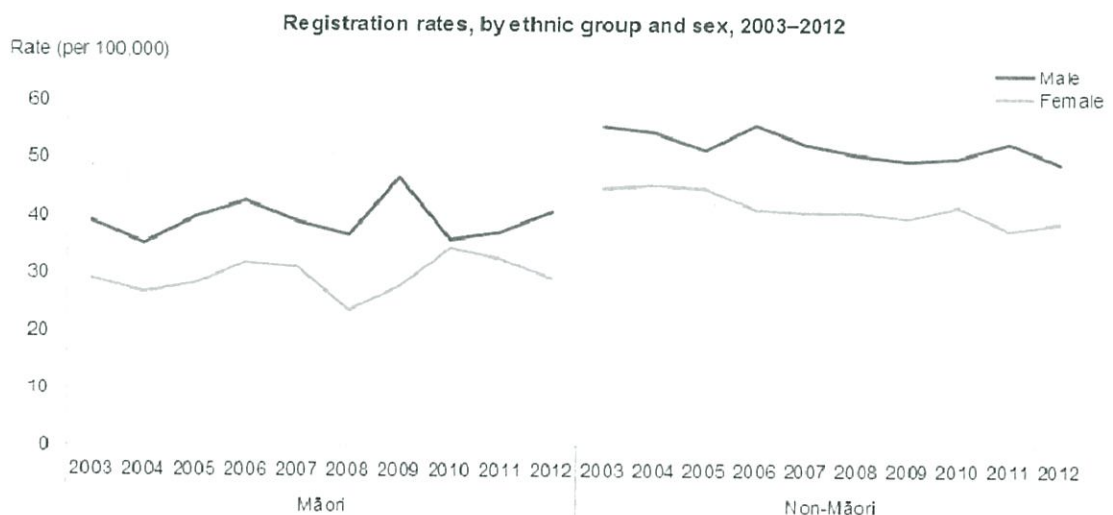


Figure 9: Registration rates by ethnic group and sex, 2003-12

Source: Ministry of Health 2015

Note: Rates are expressed per 100,000 population and age-standardised to the WHO World Standard Population.

- **Mortality:** Rates of death for colorectal cancer are lower for Māori than for non-Māori²². Between 2003 and 2012, the non-Māori mortality rate for colorectal cancer showed a slight downward trend. Rates for Māori were more variable year on year due to the smaller population group. The mortality rates from 2003 to 2012 are shown in Figure 10.

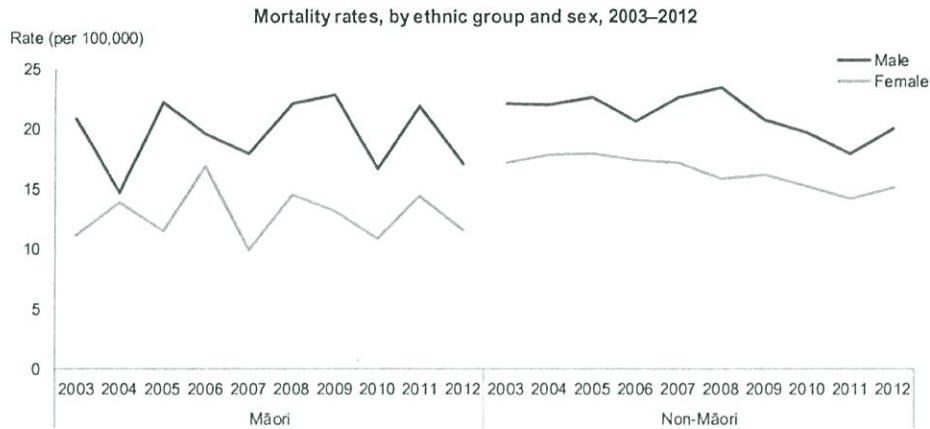


Figure 10: Mortality rates by ethnic group and sex, 2003-2012

Source: Ministry of Health 2015

Note: Rates are expressed per 100,000 population and age-standardised to the WHO World Standard Population.

- **Survival:** There is a statistically significant difference in net survival at 5 years between Māori and non-Māori (shown in Figure 11). Whilst there was an improvement in net survival at 5 years for both Māori and non-Māori between 1999-01 to 2011-13, Māori survival rates continue to lag almost 15 percentage points behind non-Māori.

Bowel cancer is one of the few cancers for which Māori show lower registration and death rates than non-Māori. However, whilst bowel cancer occurs less frequently in Māori compared to non-Māori, once diagnosed, Māori are more likely to die of bowel cancer than non-Māori. This is likely to be due to a combination of factors, including documented differences in quality of care and higher rates of co-morbidity²³ (making treatment more challenging) found in Māori²⁴. Māori are also more likely to have later stage cancer at diagnosis, negatively impacting on their survival.

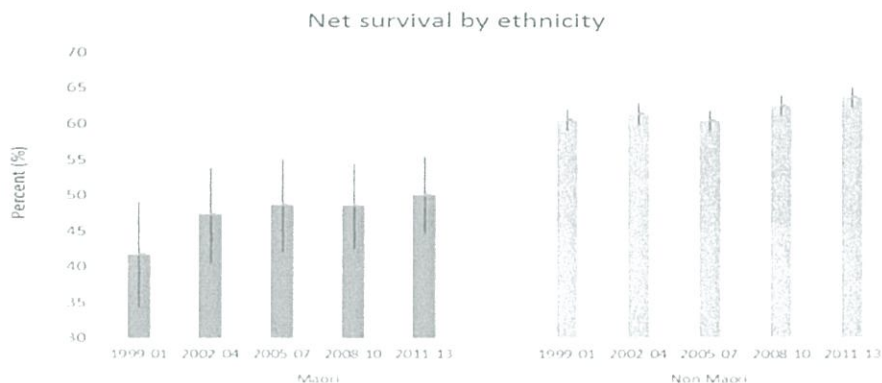


Figure 11: Net survival at 5 years, by ethnicity

Source: New Zealand Cancer Registry

²² Ministry of Health 2015: New Zealand Cancer Registry

²³ Cancer, Comorbidity and Care: Key findings from the C3 (Quantitative) Study, <http://www.otago.ac.nz/wellington/otago067851.pdf>

²⁴ Surveillance of people at increased risk of colorectal cancer, <http://www.bpac.org.nz/BPJ/2012/may/colorectal.aspx>,

Māori are often diagnosed with bowel cancer at a more advanced stage than non-Māori and treatment options are more frequently complicated by a greater co-morbidity burden²⁵. Māori, therefore, have more potential to benefit from the prevention, earlier detection, more simple treatment options and better survival outcomes for early stage disease, that result from a screening programme. The proposed national bowel screening programme therefore includes actions to ensure equitable participation in bowel screening, including:

- targeted actions to increase participation in bowel screening for Māori, Pacific and high deprivation populations groups (active follow up on invitations, targeted health promotion, engagement with community groups such as marae and churches)
 - each DHB will have an equity plan to implement locally appropriate actions to increase equity
 - national monitoring of participation and outcomes by ethnicity through the bowel screening IT solution to inform and drive actions to improve equity
 - primary care involvement in promoting participation and managing positive results
 - a public health campaign about the signs and symptoms of bowel cancer, targeted at Māori and Pasifica
 - national governance to have a strong focus on equity.
- **Deprivation:** Survival rates for people diagnosed with colorectal cancer vary significantly by deprivation quintile. Between 1998-99 and 2010-11, the five-year relative survival rate increased from 60.5 percent to 69.2 percent for Quintile 1-2 (the least deprived). Over the same period for Quintile 5 (the most deprived), the rate remained relatively constant with a small increase from 55.4 percent to 55.9 percent. Survival by deprivation quintile is shown in Figure 10.

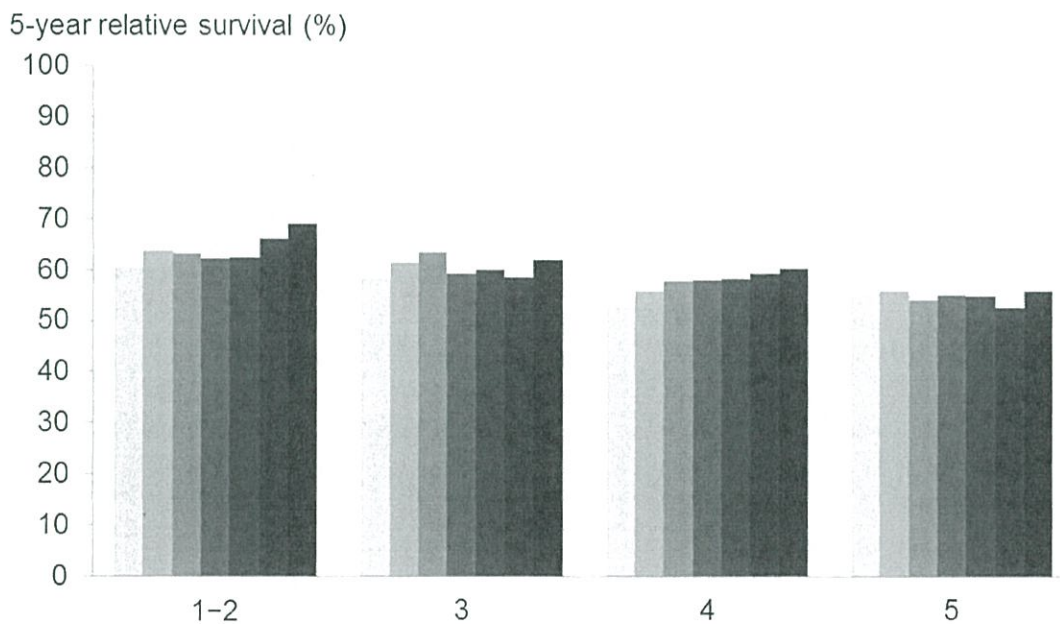


Figure 10: Colorectal cancer 5-year relative survival, by deprivation quintile, 1998-2011

Source: Ministry of Health 2015: New Zealand Cancer Registry, New Zealand

²⁵ Cancer, Comorbidity and Care: Key findings from the C3 (Quantitative) Study, <http://www.otago.ac.nz/wellington/otago067851.pdf>

Investment Objectives

The goal of bowel screening is to enable the diagnosis and treatment bowel cancer at an early curable stage, and to identify and remove pre-cancerous advanced adenomas before they become cancer. Evidence suggests that most bowel cancer develops from adenomatous polyps (adenomas) in the lining of the bowel. Those adenomas, which grow to over 10 millimetres after a number of years, are more likely to be cancerous or develop into a cancer. The slow development process from adenoma to cancer makes bowel cancer a good example of where a screening intervention in a non-symptomatic population can save lives²⁶.

The investment objectives for the proposed National Bowel Screening Programme have been developed from the extensive work that has already been undertaken in this area, in particular, from the establishment and early evaluation of the Bowel Screening Pilot. The overall investment objectives for the programme, existing arrangements and business needs are described in Table 7.

Table 7: Summary of Existing Arrangements and Business Needs

Existing Arrangements and Business Needs	
Investment Objective 1	To achieve a greater mortality reduction from bowel cancer <i>To statistically significantly reduce bowel cancer mortality from the 2012 rate at a point 10 years following the commencement of a national rollout</i>
Existing Arrangements	<ul style="list-style-type: none"> • New Zealand has the 5th highest rate of bowel cancer mortality in the developed world (2011). • Third most commonly registered cancer in New Zealand, accounting for 13.8 percent of all cancers registered (2012). • Second most common cause of cancer death (2012). • Death rates in New Zealand compared to Australia are 35 percent higher for women and 24 percent higher for men. • There is a slight downward trend in registrations.
Business Needs	<ul style="list-style-type: none"> • To increase early detection so that more cancers are identified at an early stage, increasing chance of survival and reducing mortality from bowel cancer. • To reduce, in time, bowel cancer rates to the OECD average (or better).
Investment Objective 2	To promote equity between population groups
Existing Arrangements	<p>Higher rates of bowel cancer in males, in people aged 50 or over, in the European ethnic group, and in lower deprivation quintile populations.</p> <ul style="list-style-type: none"> • Inequity nationally, as only Waitemata DHB eligible population has access to screening through the Bowel Screening Pilot (noting that this would cease if further funding was not secured). • Inequality in participation between European and Māori and Pacific population groups within the BSP.
Business Needs	<ul style="list-style-type: none"> • To reduce, as far as possible, the inequity between the population groups by driving equitable participation in bowel screening, and through learning and improving throughout the implementation. • To design a national screening programme which promotes equity. • To implement a national screening programme which has all DHBs participating within 4 years from commencement, to minimise inequities arising from some parts of the country having a screening programme whilst other areas do not.

²⁶ Memorandum to Cabinet Social Policy Committee: Bowel Cancer Screening Programme for New Zealand

Investment Objective 3	To deliver bowel screening in a manner that is acceptable and encourages participation
Existing Arrangements	<ul style="list-style-type: none"> The methodology used in the Bowel Screening Pilot has been evaluated as being acceptable and encouraging participation. No bowel screening in place in other DHBs.
Business Needs	<ul style="list-style-type: none"> National Bowel Screening Programme to adopt the pilot approach and methodology as far as possible, to minimise the risk of decreasing acceptability/participation. To implement changes where indicated by the Pilot, to increase acceptability/participation.
Investment Objective 4	To maximise benefits vs harm
Existing Arrangements	<ul style="list-style-type: none"> Within the unscreened population, there is no harm from screening but significant harm from late detection and treatment of bowel cancer. Within the pilot screening population, harm has been minimised by implementing an internationally recognised approach and ensuring adherence and monitoring of quality standards throughout the screening pathway. Harm identified during Round 1 of the Bowel Screening Pilot included bleeding, abdominal pain and perforation (higher at 1.2 per 1,000 colonoscopies than the UK comparator at 0.5 per 1,000 colonoscopies²⁷ – this reflects the high intervention rate for polyp removal in the BSP). There were no colonoscopy-related deaths. Individuals with a positive result experience increased anxiety and hence the requirement to undergo timely colonoscopy. Access to timely and high quality colonoscopy are key indicators which are closely monitored and mostly met.
Business Needs	<ul style="list-style-type: none"> To increase the benefits to the population whilst minimising potential harm. To ensure that the national screening programme delivers greater benefits than harm, minimising adverse outcomes for participants. To implement a robust quality assurance programme. To ensure access to a timely, high quality colonoscopy.
Investment Objective 5	To deliver a safe, high quality programme which is consistent nationally
Existing Arrangements	<ul style="list-style-type: none"> No national bowel screening programme. Pilot established in Waitemata DHB 2011 for eligible people aged 50-74 years.
Business Needs	<ul style="list-style-type: none"> To design and implement an evidence-based screening programme which meets international best practice standards. To have in place a national bowel screening programme which covers all of New Zealand and offers the same levels of access and quality, irrespective of geography.

4.3 Potential Business Scope and Key Service Requirements

The business scope describes the extent of change required for the programme to be considered successful.

The service requirements range from minimum (essential to the success of the programme), intermediate (essential and desirable service requirements), and maximum (essential, desirable and aspirational service requirements). Items that are determined to be out of scope for the Programme are specified for clarity. The potential business scope and key service requirements are summarised in Table 8.

²⁷ Ministry of Health [Interim Evaluation Report of the Bowel Screening Pilot: Screening Round One](#) 24 February 2015

Table 8: Potential scope and key service requirements

Service Requirements	Scope Assessment			
	Minimum Scope	Inter-mediate Scope	Maximum Scope	Out of Scope
Screening for all people aged 60-74 years, living in NZ who are eligible for publicly funded services	✓			
Screening by iFOBT, including distribution and return of kits, and analysis	✓			
Colonoscopy for participants with positive iFOBT	✓			
IT solution capable of supporting a national programme	✓			
Coordination centre to support the full programme	✓			
Quality standards across the programme and monitoring process for these	✓			
Community engagement and promoting participation at a local level	✓			
Raising national awareness	✓			
GP engagement	✓			
Ongoing surveillance			✓	
Ongoing treatment				✓
Capital investment in additional capacity ²⁸				✓
Population Health Platform				✓

In addition to the key service requirements outlined above, a national programme for bowel screening would align with the National Screening Unit (NSU) **core set of six principles**²⁹. These are summarised below and detailed in Appendix 4.

1. The overall benefits of screening must outweigh the harm;
2. National screening programmes are people centred;
3. National screening programmes will work towards achieving equitable access to the screening pathway and equitable outcomes for all population groups;
4. Informed consent is a priority throughout the screening pathway;
5. Screening programmes are monitored and evaluated on a regular basis;
6. National screening programmes are committed to continuous quality improvement in programme management and clinical service delivery.

²⁸ Capital funding for building or refurbishing facilities is excluded from this business case.

²⁹ National Screening Unit Quality Framework: March 2015

The screening programme would also be required to align with the **five essential components of organised screening systems** identified as essential to the safe and effective practice of organised screening (adapted from Hale 2012)

- A central agency to lead and coordinate the screening pathway
- Clinical governance
- Infrastructure and systems to manage a screening programme
- Monitoring and evaluation
- Quality Cycle

4.4 Main Benefits and Dis-benefits

Three main benefits are expected to be delivered by a national bowel screening programme:

- Improved health outcomes.
- Improved service delivery (including improved IT infrastructure supporting service delivery).
- More cost-effective healthcare.

Other wider societal benefits which are expected to arise from a national bowel screening programme include (but are not limited to):

- Increased contribution to society.
- Increase in the workforce.
- Quality Adjusted Life Years (QALYs) saved.

Non-Monetary Benefits

Whilst some of the benefits could in theory be quantified financially by applying a set of assumptions, these would be variable and subjective. As it is difficult to quantify these benefits financially with an acceptable degree of robustness, they are excluded from the financial analysis. The key benefits not financially quantified are summarised in Table 9 and described further below. The current approved targets were set by the Bowel Cancer Team and approved by the Clinical Director Bowel Screening.

The Programme would benchmark and monitor by ethnicity, as part of the focus on ethnicity.

Table 9: Anticipated Benefits of a National Bowel Screening Programme

Benefit Name and Description	Measure Name	Measure Description		Total Measure Value
Improved Health Outcomes Screening should result in a reduction in bowel cancer mortality (and potentially in incidence) and an improvement in quality and length of life.	Reduction in bowel cancer mortality	That the current mortality rate from bowel cancer has decreased, 10 years following the commencement of screening.	Baseline target	Age standardised* colorectal cancer mortality rate per 100,000 population - 2012 data - Total population: 17.4 - Maori population: 14.0 - Non-Maori population: 17.4
			Current Approved Target	At a point 10 years following the commencement of a national programme offered to all the eligible population with appropriate participation, the colorectal cancer mortality rate is statistically significantly lower than in 2012, for each of the 3 groups above.
			Actual achieved to-date	
	Reduction in bowel cancer incidence	That the current incidence of bowel cancer will begin to decrease 10-15 years following the commencement of screening.	Baseline target	Age standardised* colorectal cancer registration rate per 100,000 population - 2012 data - Total population: 43.5 - Maori population: 34.3 - Non-Maori population: 43.8
			Current Approved Target	At a point 10 years following the commencement of a national programme offered to all the eligible population with appropriate participation, the colorectal cancer registration rate is statistically significantly lower than in 2012, for each of the 3 groups above.
			Actual achieved to-date	
	Benchmarking improvement with international comparisons - variance from OECD average	That the current standing of NZ in the OECD moves closer to the OECD average	Baseline target	In 2011, the OECD published information (using 2009 NZ data) which stated that the NZ mortality rate from colorectal cancer was 30% higher than the average OECD rate.
			Current Approved Target	At a point 10 years following the commencement of a national programme offered to all the eligible population with appropriate participation, the NZ mortality rate is 5% closer to the average mortality rate for OECD countries (as measured by the OECD)
			Actual achieved to-date	
	Increase in proportion of people diagnosed with Stage I bowel cancer	That there is an increase in the current percentage of people diagnosed with bowel cancer at Stage I, which is more easily treated and results in increased survival benefits	Baseline target	In a 2007-2008 study (PIPER) it was shown that 13% of NZ bowel cancer patients were diagnosed with Stage I bowel cancer.
			Current Approved Target	That once bowel screening is occurring nationally, at least 20% of NZ bowel cancer patients are diagnosed at Stage I.
			Actual achieved to-date	
Increase in 5 year relative survival rate for colorectal cancer	Screening should result in an proportional increase of people diagnosed with bowel cancer at an earlier stage. This should translate into an increase in the 5 year relative survival rate.	Baseline target	In 2010/2011 the national 5-year relative survival rate for patients with colorectal cancer (MoH survival report) was: - Total population: 63.3% - Maori population: 54.0% - Non-Maori population: 63.8%	
		Current Approved Target	At a point 10 years following the commencement of a national programme offered to all the eligible population with appropriate participation, the 5-year relative survival rate is higher than in 2010/2011, for each of the 3 groups above.	
		Actual achieved to-date		
Improved service delivery The implementation of a national screening programme would impact on wider service delivery, and should result in improved services including and beyond bowel screening.	Reduction in the proportion of colorectal cancers first identified through presentation at the Emergency Department	A national screening programme should decrease the proportion of colorectal cancers that are first diagnosed through the Emergency Department, which will reduce pressure on DHB EDs and reduce diagnostic and treatment costs.	Baseline target	The 2008/2009 PIPER study identified that: - Total population: 34% of colon cancers and 14% of rectal cancers were first identified through the ED - Maori population: 44% of colon cancers and 21% of rectal cancers were first identified through the ED
			Current Approved Target	At a point 10 years following the commencement of a national programme offered to all the eligible population with appropriate participation, the proportion of all colorectal cancers first diagnosed through ED will be lower than the 2008/2009 rates, for the total population and for Maori.
			Actual achieved to-date	
	Increase in the number of DHBs with endoscopy units using ProVation software	ProVation allows clinicians to monitor and potentially improve quality of the endoscopic procedure. National benefit from all DHBs using the same version.	Baseline target	13 DHBs currently utilise a version of ProVation
			Current Approved Target	That all 20 DHBs utilise a supported version of ProVation by the end of the national roll out period. Information collected and reported nationally will be standardised.
			Actual achieved to-date	

* Age-standardised to the WHO world standard population, using ICD10-AM codes C18-C21.

Improved health outcomes

The single most important benefit from a national bowel screening programme is the reduction in mortality and increase in quality, and length, of life for individual people.

Extrapolation of figures from the pilot shows that, over the first round (or first two years) of a bowel screening programme offered to 60-74 year olds with the recommended elevated threshold for positivity, approximately 1400 cancers nationally would be detected. This estimate is considered to be conservative because Waitemata DHB has a lower rate of colorectal cancer than many other DHBs in New Zealand. After 8-10 years, bowel screening would reduce the mortality rates for bowel cancer in New Zealand by at least 16-22 percent in the age group offered screening. The 2016 cost-effectiveness report from Sapere Research Group³⁰ estimated a reduction in bowel cancer incidence of 35 percent, and a reduction in bowel cancer mortality of 39 percent (based on pilot parameters), over the lifetime of the cohort modelled.

The possible changes in colorectal rates are shown in Figure 11.

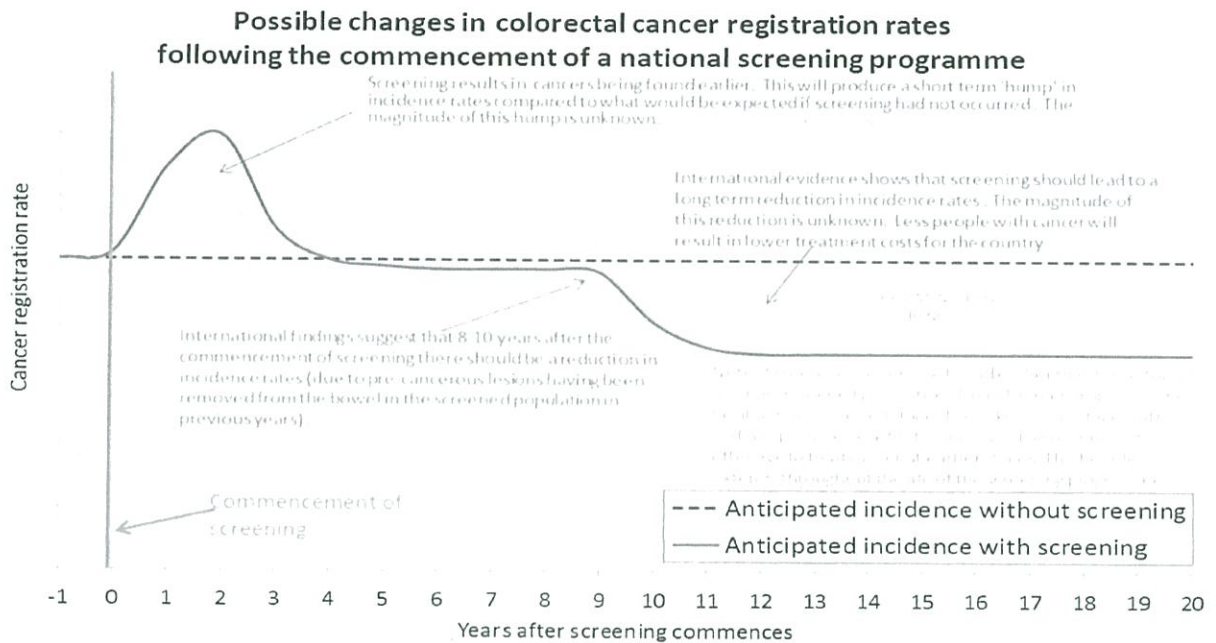


Figure 11: Possible changes in colorectal cancer registration rates

One of the key outcomes of screening is that cancers would be diagnosed at an earlier stage. Bowel screening also has the potential advantage of detecting preclinical disease (i.e. polyps), removing them and thereby lowering incidence rates. However, as recently demonstrated in Italy³¹, this takes a number of years. Where pre-clinical disease or very early stage cancer are detected, these may be treated immediately with no further treatment required. This improves quality and length of life, as treatment for later-stage cancer (e.g. radiotherapy, chemotherapy) can be intrusive and unpleasant, and the chance of survival reduces rapidly with diagnosis of more advanced stage cancers. Screening may also identify other, non-cancer conditions which may be treated, resulting in an improved quality of life.

³⁰ Draft: The cost effectiveness of bowel cancer screening in New Zealand: a cost-utility analysis based on pilot results. Sapere research group, 23 May 2016

³¹ [Impact of Screening Programme on Incidence of Colorectal Cancer](#) Rossie et al, American Journal of Gastroenterology Vol 110, Sep 2015

In the Bowel Screening Pilot, 39 percent of eligible participants diagnosed with cancer were diagnosed at Stage I, compared with 13 percent in the general population (as shown in the 2015 PIPER study³²). Figure 12 shows the spread of disease relating to each stage of bowel cancer.

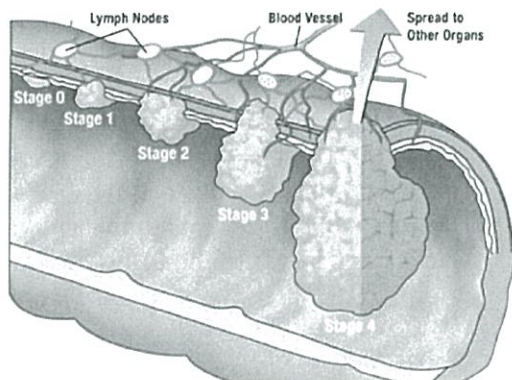


Figure 12: Stages of Bowel Cancer

Diagnosis at Stage II and III was broadly similar for screened and non-screened populations, but diagnosis at Stage IV was significantly lower in the Pilot, with only 8 percent diagnosed at that stage compared with 24 percent of the unscreened population. The comparisons are shown in Table 10.

Table 10: Stage of Diagnosis - Bowel Screening Pilot and PIPER study³³

Stage of diagnosis	New Zealand: Bowel Screening Pilot (2012-2015) aged 50-74		New Zealand: (2007-2008) aged 50-79	
	Stage distribution - No.	Stage distribution - %	Stage distribution - No.	Stage distribution - %
I	78	39%	367	13%
II	49	24%	774	27%
III	42	21%	723	25%
IV	16	8%	699	24%
Unknown	17	8%	293	10%
Total	202	100%	2856	100%

Meta-analysis undertaken in 2007 indicated that there is a relative-risk reduction for colorectal cancer of 25 percent for eligible participants attending at least one round of iFOBT screening³⁴. This mortality reduction equates to 5.5 fewer deaths over 10 years per 100,000 people aged 50 and over, and 17.5 fewer deaths per 100,000 people aged 60 and over.

Improved service delivery

The implementation of a national bowel screening programme is expected to have knock-on effects on a number of associated service areas.

There is evidence to suggest that the existence of a national bowel screening programme would act as an impetus to improve the quality and efficiency of colonoscopy and related bowel cancer services. The introduction of organised breast screening programmes in New Zealand has resulted in measurable system

³² The PIPER Project Final report 7 August 2015, Health Research Council reference: 11/764. The PIPER study was published in 2015 but was based on 2008/2009 bowel cancer registrations.

³³ The PIPER Project Final report 7 August 2015, Health Research Council reference: 11/764

³⁴ 2007 Cochrane meta-analysis Surveillance of People at Increased Risk of Colorectal Cancer: www.bpac.org.nz/BPJ/2012/may/colorectal.aspx

improvements in diagnostic and treatment services for breast cancer. There is evidence from international bowel screening programmes to suggest that similar improvements would be achieved in colonoscopy services³⁵. This is known as the 'halo effect' and should drive improvements in symptomatic, surveillance, pathology and wider cancer services due to the imposed rigour of the new screening programme.

In order to ensure that the screening service can be delivered safely and effectively, adequate information technology (IT) systems and support need to be in place. The implications for IT are considered as part of the overall Programme business case. It is anticipated that the IT solution used for the screening pilot would be enhanced and aligned with Ministry of Health architecture, as well as being designed to ensure DHB integration, including pathology and endoscopy reporting. This would deliver a system capable of managing the bowel screening programme for the foreseeable future. There is a need to achieve consistency with endoscopy unit reporting systems, which would have wider benefits to the DHBs, not just to the screening programme.

The Bowel Screening Pilot focus on ensuring an efficient and effective pathway for eligible participants once diagnosed with bowel cancer has also resulted in improved consistency in the care pathway within Waitemata DHB. It is expected that this finding would be true in the other DHBs as the programme is rolled out, improving consistency (and quality) of care for all eligible participants with bowel cancer. Overall, it is expected that the bowel screening programme would support enhanced pathways of care and improved health systems integration.

A national screening programme should support a reduction in presentations at emergency departments, freeing capacity and contributing to the Shorter Stays in Emergency Departments health target. Without screening, the majority of colon cancer is detected when it is symptomatic. The mode of first presentation for 34 percent of people in the non-screened population is to the Emergency Department (rising to 44 percent for Māori and 51 percent for Pacific people). In the UK, where a national screening programme is established, this figure is 21 percent³⁶.

Wider Social and Economic Benefits

The establishment of a national bowel screening programme is expected to realise significant social and economic benefits. Estimates have been made of the expected value of these benefits, within the economic evaluation. As the estimated costs are indications of the wider social and economic benefits, and cannot be validated to a high degree of certainty, they have not been included in the financial analysis. The key social and economic benefits identified for the programme are summarised in Table 11.

Table 11: Wider Social and Economic Benefits

Benefit Name and Description	Measure Name	Measure Description		Total Measure Value
Wider societal and economic benefits The establishment of the NBSP is expected to realise significant social and economic benefits	Quality Adjusted Life Years (QALYs) saved	A national screening programme should increase the number of QALYs, on average, for all those invited to the programme	Baseline target	As detailed in the recent Evaluation Report, the Programme is expected to produce a QALY gain of 0.0607 (22 days) per person invited.
			Current Approved Target	At a point 10 years following the commencement of national screening, the QALY gains can be re-assessed.
			Actual achieved to-date	
	Increase in paid workforce	Those aged over 60 are more likely to be retained in the workforce until retirement, if diagnosed with bowel cancer, early	Baseline target	Unknown
Current Approved Target			Unknown	
Actual achieved to-date				

³⁵ Memorandum to Cabinet Social Policy Committee: Bowel Cancer Screening Programme for New Zealand

³⁶ The PIPER Project Final report 7 August 2015, Health Research Council reference: 11/764

QALYs saved: Data from the (currently in draft) Bowel Screening Pilot’s final evaluation report included detailed cost effectiveness information. The report found that if bowel screening was rolled out nationally, using the BSP parameters, there would be a QALY gain of 0.0747 (27 days) per invitee to the programme. Additional analyses have recently shown that the QALY gain for a Programme using an age-range of 60-74 and a positivity threshold of 200ngHb/ml buffer would result in a QALY gain of 0.0607 (22 days) per person invited. The net present value of the benefit is modelled at **S9(2)(f)(iv)** over the 20 year modelled period.

Contribution to society: Reduced morbidity and mortality rates would contribute to lower social costs, fewer work hours lost and the opportunity for greater whānau and community contribution. People aged 60-74 currently work, pay taxes, and contribute to society. Around 35% volunteer³⁷ support to their families as caregivers. This enables parents to work (reducing benefits) or providing home support whilst younger adults work. Children who are well-supported are more likely to attend school, learn and develop in line with their peers, and participate in social activities. The benefits relating to contribution to society have been estimated at 30% of the value of a statistical life, divided by the life expectancy. The cost evaluation analysis undertaken to support this business case estimates the contribution to society at **S9(2)(f)(iv)** over the 20 year modelled period.

Monetary Benefits

There is potential for direct financial benefits to be realised from the implementation of a national bowel screening programme (Appendix 8, Option 4). The expected areas of financial benefit are:

- A reduction in the lifetime costs of treating bowel cancer.
- The reduction in subsequent treatment needed due to stage shift (cancers diagnosed at an earlier stage).
- The removal of pre-cancerous lesions before these can develop into bowel cancer.

These areas of financial benefit have been combined as ‘more cost-effective healthcare’. The beneficiaries and potential measures are shown in Table 12 and described further below.

Table 12: Anticipated Monetary Benefits of a National Bowel Screening Programme

Benefit Name and Description	Measure Name	Measure Description		Total Measure Value
Direct financial benefits from the implementation of the Programme The establishment of the NBSP is expected to realise significant cost benefits	More cost effective healthcare	Screening has been modelled as being extremely cost effective, with a good chance of being cost saving. This is a combination of cancers being found earlier (resulting in lower treatment costs) and pre-cancerous polyp removal resulting in fewer cancers occurring in the population.	Baseline target	Awaiting final cost-effectiveness results from the (currently draft) final evaluation - specifically for the age group and positivity combination chosen for the Programme.
			Current Approved Target	At regular intervals following the commencement of national screening, the cost-effectiveness can be re-assessed.
			Actual achieved to-date	

The financial benefits identified are based on outcomes from the Bowel Screening Pilot in Waitemata DHB and evidence from other international screening programmes. These would be revalidated once the final evaluation of the Bowel Screening Pilot is available, expected mid-2016.

³⁷ Department of Internal Affairs Volunteering and Donating Indicator, September 2014

Screening has been shown, both internationally and in New Zealand, to detect cancers at an earlier, more treatable (and less costly to treat) stage. Of the cancers diagnosed through the Bowel Screening Pilot, 65-70 percent were Stage I or II, compared with approximately 40 percent of all bowel cancers diagnosed in New Zealand through symptomatic services³⁸. Where cancer is diagnosed at an earlier stage, this is associated with lower treatment costs compared to the cost of treating more advanced cancer. One in 10 of all cancers found during the Pilot were identified at such an early stage that they required no further surgery, chemotherapy or radiotherapy post colonoscopy³⁹.

Table 13 shows the variance in average treatment costs between different stages of bowel cancer (based on Irish data, the most comparable data available).

Table 13: Costs of Treatment for Colorectal Cancer Stages i-iv⁴⁰

Stage	Lifetime Excess Healthcare Costs from Colorectal Cancer per person, age 60-79 (NZ\$) ⁴¹
I	42,740
II	70,745
III	93,341
IV	59,339

Internationally there is substantial evidence to prove cost-effectiveness. A 2011 review of 32 cost-effectiveness models found that in all cases, colorectal cancer screening was cost-effective or even cost-saving compared with no screening⁴². Every country that has established a national screening programme has shown it to be cost-effective, i.e. that the value of each year of life gained (in perfect health) costs less than the per capita Gross Domestic Product (GDP) for the population. In New Zealand, the GDP per capita is approximately NZ\$40,000, therefore if the cost of each quality year of life gained is less than \$40,000 the programme can be considered to be cost-effective.

Some countries show *cost savings* when a screening programme is implemented. This is usually due to pre-cancerous lesions being removed from the bowel before they develop into bowel cancer, and the stage shift seen between people identified through symptomatic services and those identified through screening. It costs less to treat someone with Stage I bowel cancer compared to someone with Stage II. There is evidence that the cost-effectiveness of screening is becoming more favourable, as treatment savings from preventing (advanced) colorectal cancer and colorectal cancer deaths by screening outweigh the screening costs⁴³.

The University of Otago review of health gain and cost-effectiveness by ethnic group and age-range⁴⁴ found that colorectal cancer screening in NZ using iFOBT is likely to be cost effective in all cases and cost saving in some:

- When modelled for those aged 50-74 (the scenario used in the Waitemata Bowel Screening Pilot), the intervention was found to be 'highly cost-effective' for all sex and ethnic groups.

³⁸ The PIPER Project Final report 7 August 2015, Health Research Council reference: 11/764

³⁹ Mike Hulme-Moir, CD Bowel Screening Pilot

⁴⁰ Draft: The cost effectiveness of bowel cancer screening in New Zealand: a cost-utility analysis based on pilot results. Sapere research group, 23 May 2016

⁴¹ The values used in the CBAX analysis are lower than the values shown in Table 13, as the CBAX excludes end of life costs.

⁴² Lansdorp-Vogelaar I, Knudsen AB, Brenner H, *Epidemiol Rev.* 2011; 33:88-100. Doi: 10.1093/epirev/mxr004.epub 2011 Jun1

⁴³ Lansdorp-Vogelaar I, Knudsen AB, Brenner H, *Epidemiol Rev.* 2011; 33:88-100. Doi: 10.1093/epirev/mxr004.epub 2011 Jun1

⁴⁴ University of Otago, Colorectal cancer screening: Variation in health gain and cost-effectiveness by ethnic group, and optimal age-range to screen, paper under review as at December 2015

- When looking at all those in the New Zealand population aged between 40 and 89, the most cost effective 15-year age group was 60-74 year olds, which was found to be highly cost effective for both Māori and non-Māori. Calculations showed that the intervention for the 65-69 age group was actually cost-saving.
- Within this particular modelled scenario, for an age group to be deemed cost effective one quality adjusted life year (QALY) needed to cost less than the New Zealand GDP per capita (approximately NZ\$40,000).

This review therefore corroborates (from a cost-effectiveness perspective) the decision to screen New Zealanders between the ages of 60-74, as proposed in this business case. The aim of screening for colorectal cancer is to reduce the mortality from colorectal cancer and, in the longer term, potentially reduce the incidence of colorectal cancer. This can only happen if a significant proportion of the population is screened. A more narrow age range would not achieve the population mortality benefits required. Consequently, as in other OECD countries, this business case proposes the widest age range for which screening maximises the mortality benefits as soon as possible, ensuring a return on investment. The age range parameters would be evaluated and reviewed after the Programme has been fully implemented.

Unquantified Benefits

It is anticipated that there would be further benefits from the proposed investment, which cannot easily be quantified but which nevertheless support the case for investment.

- **Improved relationship/engagement with primary care:** Having primary care as an active partner in the bowel screening programme facilitates improved integration and relationships across the health system, which has the potential to have flow on effects for other health issues. It would support the maintenance of a person's main health relationship with primary care, given the broad knowledge and information primary care has about their enrolled population.
- **Raised awareness of bowel cancer:** Results from the Waitemata DHB to date indicate that over the initial two years of the pilot, bowel screening raised awareness of the symptoms of bowel cancer, resulting in an approximately 20 percent increase in referrals for diagnostic colonoscopy, i.e. for investigation of bowel symptoms⁴⁵. The 'bystander effect' of raising population awareness of bowel cancer and symptoms, and disease prevention, is a significant benefit. 'Health literacy' would be improved as people understand more about their health needs and options.
- **Increased identification of individuals and families with genetic bowel cancer syndromes:** Highlighting and assessing the significance of family history of bowel cancer as part of the bowel screening pathway has the potential to identify families with a genetic predisposition to developing bowel cancer. In the Netherlands, approximately 16 percent of participants presenting for colonoscopy as part of the bowel screening programme had a family history of bowel cancer and approximately 6 percent were referred for genetic assessment. Offering these families regular colonoscopy has the potential to substantially further increase the bowel cancer incidence and mortality benefit from bowel screening. The current Familial Gastrointestinal Service has provided an estimated cost benefit of \$11 million annually in saved hospital costs.
- **Wider health benefit:** In addition to the direct health benefit to the individual, there is a wider health benefit to the system and other cancer patients as a result of detecting and treating, earlier stage bowel cancers. Where no further surgery, chemotherapy or radiotherapy is required post colonoscopy, this frees up constrained resource for other cancer patients and assists the achievement of the faster cancer waiting times for all patients. Earlier diagnosis and reduced mortality would also reduce pressure on hospice and palliative care services.

⁴⁵ Email with Debbie Holdsworth, Director of Planning and Funding, Auckland and Waitemata DHBs.

Dis-benefits

In any change process, there are benefits as well as dis-benefits i.e. the known downsides of making the investment. They are things that would definitely occur (as opposed to risks which may or may not occur). Table 14 summarises the main dis-benefits identified for this programme.

Table 14: Dis-Benefits of Implementing a National Bowel Screening Programme

Dis-Benefit	Summary
Increased inequity between population groups	<ul style="list-style-type: none"> Whilst every effort would be made to minimise inequity between population groups, evidence from the pilot and other screening programmes nationally indicate that the Programme would have a disproportionately positive impact on some population groups. Females, people in higher socio-economic groups and non-Māori/non-Pacific populations are more likely to participate. Actions to drive equitable participation will mitigate this. Māori and Pacific populations will gain the reduced mortality benefits from screening, but will benefit less than other population groups due to a lower incidence of colorectal cancer.
Adverse health outcomes from the screening process	<ul style="list-style-type: none"> Some eligible participants would receive a false negative from the initial screening, causing false reassurance. People with symptoms may be less likely to seek medical attention and therefore some cancers would be missed or diagnosis delayed. This would be mitigated as far as possible by providing good information to screening participants. Some eligible participants would have a cancer missed at colonoscopy causing them to disregard symptoms delaying diagnosis. Some eligible participants would have a false positive test result (that is, have no abnormality at colonoscopy) from screening, creating anxiety whilst they wait for a colonoscopy. Some eligible participants would experience adverse outcomes from the colonoscopy, including bleeding or tearing of the bowel wall (if a polyp is removed or a tissue sample is taken for testing) or complications from sedation. The risk of a significant complication is about one in 1,000 procedures. This harm, whilst significant for the individuals, is within internationally acceptable ranges. Rarely, these adverse outcomes can result in death.
Delays in diagnosing bowel cancer for some populations	<ul style="list-style-type: none"> The proposed phased rollout of the Programme would result in people in some areas being offered screening later than those in other areas. Some cancers would have diagnosis delayed as a result of the rollout approach.
Programme parameters will result in some cancers not being identified	<ul style="list-style-type: none"> The constrained age-range for the programme will result in people outside this range not being screened, resulting in some cancers not being identified. The threshold for positivity on the iFOBT test will result in some cancers not being identified, which would have been detected with a lower threshold for positivity.
Opportunity cost	<ul style="list-style-type: none"> The cost of implementing the National Bowel Screening Programme would preclude investment in other priority areas. This would be at both a national level and a local level, as DHBs may need to prioritise capex and/or opex to implement the programme in their area. Increased endoscopy suite/theatre and consultant time allocated to screening programme activity would reduce capacity available for other patients/activities.
Increased pressure on staff	<ul style="list-style-type: none"> Endoscopy and histology capacity is constrained. As the rollout progresses, the pressure on staff in these areas would increase until increased investment can improve workforce capacity.

As experienced internationally, screening programmes often increase ethnic inequalities in health. The findings of the December 2015 paper from the University of Otago⁴⁶ suggest that although a national bowel screening programme would offer health gains for both Māori and non-Māori, it will almost certainly increase inequalities between the two.

Māori have lower incidence of colorectal cancer, higher background mortality and are likely to have lower screening coverage compared to non-Māori. This would almost certainly result in an increased disparity in cancer outcomes. To be clear, a national bowel screening programme would improve total population health and result in health gains for both Māori and non-Māori. However, non-Māori gains are likely to be larger. The net effect is that the disparity between Māori and non-Māori cancer health outcomes would increase. The pilot has since achieved improved participation rates for Māori and Pacifica as a result of targeted actions to drive equitable participation, which will result in reduced disparity in outcomes.

The University of Otago paper suggests it would be theoretically possible to achieve equal health gains by increasing coverage for Māori to a level high enough to offset the lower colorectal cancer incidence and the higher background mortality. However they go on to suggest that the resources required to achieve equal health gains may be better used elsewhere to reduce Māori health inequalities, such as in tobacco control, as this intervention may offer the potential for even greater inequality reduction.

Whilst the dis-benefits summarised in Table 14 cannot be eliminated, they reinforce the need for robust mitigating actions to minimise their impact. The proposed national bowel screening programme will:

- Include actions to ensure equitable participation in bowel screening, such as targeted actions to increase participation in bowel screening for Māori, Pacific and high deprivation populations groups; DHB equity plans; national monitoring of participation and outcomes by ethnicity; primary care involvement; and national and local governance to have a strong focus on equity.
- Minimise adverse health outcomes by ensuring robust and closely monitored quality standards and the establishment of a national bowel screening IT solution to capture information and support monitoring and evaluation activity.

4.5 Key Programme Risks

The key programme risks identified and evaluated by the Ministry’s IT and Bowel Cancer teams are recorded in the Programme Risk Register. Detailed risk management planning is ongoing and would continue during the detailed planning and implementation of the Programme.

The risks assessed as having the highest risk rating are summarised in Table 15. A summary of the current high programme risks is attached as Appendix 5.

Table 15: Key Programme Risks

Key Risks	Summary and Risk Management Strategies
Enhanced and extended Pilot IT system is not available or cannot be integrated by the DHBs.	Delay in roll- out of the first three DHBs. This would be mitigated by: <ul style="list-style-type: none"> • Good governance and oversight of Programme, strong programme and project management. Rigorous management of scope and schedule. • Clear scope control. • Ensuring adequate resourcing and funding to deliver the Programme, and ensuring the business case recommends adequate CAPEX. • Broad stakeholder consultation, detailed and clear IT requirements documented. • Robust exception reporting.

⁴⁶ University of Otago, [Colorectal cancer screening: Variation in health gain and cost-effectiveness by ethnic group, and optimal age-range to screen](#), paper under review as at December 2015

Key Risks	Summary and Risk Management Strategies
NBSP IT solution is delayed or has insufficient functionality	<p>DHBs roll-out onto the NBSP IT solution will be delayed, which may result in timeframe for delivering the NBSP to all regions being delayed. This would be mitigated by:</p> <ul style="list-style-type: none"> • Good governance and oversight of Programme, strong project management. • Rigorous management of scope and schedule and early locking down of requirements. • Clear scope control. • Ensuring adequate resourcing and funding to deliver the Programme, and ensuring the business case recommends adequate CAPEX. • Broad stakeholder consultation, detailed and clear IT requirements documented. • Robust exception reporting.
The Infrastructure partner and hosting environment is not decided within programme timeframes then there will be a delay to the programme delivery	<p>Where the infrastructure will be hosted and supplied is yet to be confirmed and will result in delays if it is not in place at the start of the IT solution development. A delay in agreement on hosting location/arrangements will have a knock on effect in finalising/signing the Infrastructure Supplier contract. This may result in the infrastructure required not being in place, causing a delay to Tranche 1 delivery as the infrastructure decision and contract is a prerequisite for Tranche 1 delivery timeline. It would also delay delivery of the NBSP IT solution delivery. This risk would be mitigated by:</p> <ul style="list-style-type: none"> • Governance Board approval at the start of the programme for the Infrastructure hosting strategy. The chosen infrastructure supplier has the necessary resources and capability to deliver to the project delivery timeframes. • Ensuring that the infrastructure requirements are clear and available as soon as the Governance Board approval has been given. • Working within existing contracts and preferred suppliers. • Working closely with the programme procurement.

4.6 Key Constraints and Dependencies

The proposal is subject to constraints (limitations imposed on the investment proposal from the outset) and dependencies (external influences e.g. actions or developments outside the scope of the programme upon which success is dependent). The key constraints and dependencies are summarised in Table 16.

Table 16: Key Constraints and Dependencies

Constraints	Notes
Workforce and facility capacity	<p>Comprehensive modelling for the Programme rollout has shown that in the year with the greatest colonoscopy demand (2019/20) an additional 8,300 colonoscopies would be required. Of the total volume of colonoscopies in New Zealand in that year, screening colonoscopies would account for 18%. This modelling takes into account current waiting lists (symptomatic and surveillance), ageing population, predicted 20% increase in demand for symptomatic colonoscopies (as seen in the Bowel Screening Pilot and internationally) and a gradual increase in Computed Tomography colonoscopy as capacity allows.</p> <p>Workforce capacity:</p> <ul style="list-style-type: none"> • Endoscopy capacity would limit the number of colonoscopies which could be undertaken, thereby limiting the age range of the proposed rollout. • Pathology capacity would limit the volume of pathology samples that could be processed. <p>Facility capacity:</p> <ul style="list-style-type: none"> • Insufficient existing endoscopy suite/theatre capacity to undertake the projected volume of colonoscopies in some DHBs. Private capacity is also limited and therefore implementation in some DHBs cannot occur until adequate capacity is available.

Constraints	Notes
Programme go-live mid-2017, rollout complete by end of 2019	The Programme will go-live from mid-2017 and is expected to have all DHBs live by the end of 2019 at the earliest.
Budget timeline	If the restated business case is not approved in August 2017, to release set up funds appropriated in Budget 2016, the first implementation would not go-live in July 2017 as there would be insufficient time to plan effectively.
National consistency and continuing quality improvements	The programme is required to deliver high quality screening, consistently across New Zealand. Local variation (e.g. in testing approach, age-range etc.) is not acceptable.
Dependencies	Notes
DHBs ensuring adequate workforce and facility capacity	The programme would require DHBs to establish capacity to meet the projected volumes. This would be managed through: <ul style="list-style-type: none"> Regional coordination of capacity. Local (DHB) commissioning of additional endoscopy suite capacity. Local (DHB) commissioning of private capacity.
DHB IT system integration with bowel screening IT solution	<ul style="list-style-type: none"> IT solution to support the National Bowel Screening Programme must be interoperable with existing DHB IT systems. Data Warehouse – to support extracts and reporting for Programme quality/performance monitoring and evaluation.
DHB technical capability to provide data to Ministry (central repository)	<ul style="list-style-type: none"> DHBs to plan for delivery of data and ensure appropriate mechanisms would be established prior to go-live. DHB IT readiness in terms of capacity, capability, funding prioritisation etc.
Endoscopy improvement activities	DHBs to ensure they have good foundations to commence screening. These could include: <ul style="list-style-type: none"> Achievement of quality standards through the Global Rating Scale. Availability of national clinical decision support software in endoscopy units (Electronic endoscopy reporting systems - to facilitate monitoring quality of colonoscopy).

4.7 Stakeholder Engagement

Stakeholder engagement and communication has been, and would continue to be, critical for the success of the Programme. Key stakeholders have been identified and analysed to determine level of influence and the extent the Programme would impact them; for example, the degree to which they would be required to change their current business/behaviour.

Highly impacted and influential stakeholders have been engaged extensively through a national meeting and a series of regional meetings during August and September 2015 to explore how a national bowel screening programme could be delivered. Waitemata DHB has been a key partner in developing the Programme approach, providing information and insight into the successes and challenges of the pilot and ensuring that the proposed programme considers learning from the first four years.

A variety of agencies have been engaged, including the Treasury, MBIE, the office of the GCIO and DPMC. This has included scoping meetings and ongoing update meetings with the Treasury. Ongoing engagement is expected with the office of the GCIO and the Capital Investment Committee as the business case development progresses. The Programme has been assessed as 'High' on the Treasury Risk Profile Assessment, and it is expected that monitoring agencies would continue to be engaged through the life of the Programme, including through Gateway reviews and independent Programme Monitoring.

In the initial planning stages, the Ministry has engaged with other Ministries to discuss potential opportunities and implications for a national bowel-screening programme. To date these include: Ministry of Social Development, Department of Corrections, Ministry of Pacific Island Affairs and Te Puni Kōkiri.

It is anticipated that the government agencies identified above would continue to be engaged on an ad hoc basis, to provide advice and guidance, links to key networks and opportunities where appropriate. Initial discussions have explored a mutual concern about participation, logistics and ensuring the promotional approach of the national bowel screening is delivered in an informed manner.

Once the planning of the stakeholder and communications for the programme is fully underway, the programme team would investigate these issues and opportunities further and utilise regional networks that would assist in promotion and championing at a local level. This is likely to include NGOs and other community groups that would be important in ensuring equity and consideration of cultural sensitivities.

Key stakeholders are shown in Figure 13. Many are influential (i.e. they can influence the direction or design of the proposed programme) but are not directly impacted by the programme. As the most significantly impacted group, eligible participants, have relatively low influence, it is important to continue to seek their input to the programme design and implementation. To date, this has been achieved through surveys and discussion, primarily in the eligible population for the Bowel Screening Pilot and membership on national groups as appropriate.

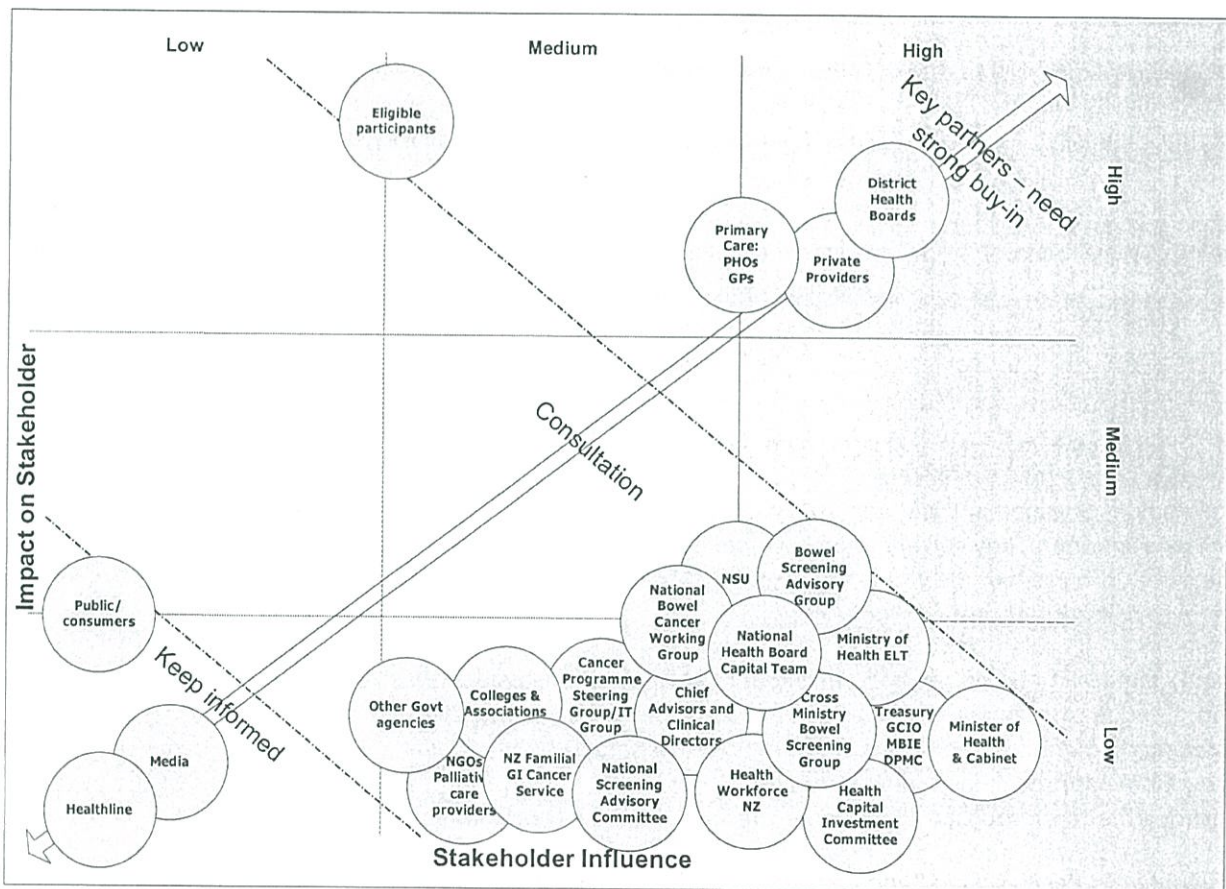


Figure 13: Key Stakeholders - Influence and Impact