

# Colorectal Cancer Screening in Canada

## MONITORING & EVALUATION OF QUALITY INDICATORS – RESULTS REPORT

JANUARY 2011 – DECEMBER 2012



Alberta Colorectal  
Cancer Screening  
Program



Cancer Care Ontario  
Action Cancer Ontario



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# Executive Summary

## Burden of Disease

Colorectal cancer is the third leading incident cancer and the second leading cause of cancer mortality in Canada, with a projected 24,400 new diagnoses and 9,300 deaths in 2014.<sup>1</sup> While incidence rates have been declining since 2001,<sup>1</sup> Canada has one of the highest age-standardized rates of colorectal cancer incidence worldwide.<sup>2</sup>

Colorectal cancer can occur at any age, but approximately 93% of new cases occur in men and women age 50 or older.<sup>1</sup> The mortality rate for colorectal cancer continues to decline for both males and females.<sup>1</sup> This observed decline is attributable to several factors, including increased screening uptake, changing prevalence of risk factors for colorectal cancer, and therapeutic advances, particularly the widespread use of adjuvant chemotherapy in colon cancer<sup>1,3</sup> and preoperative radiotherapy in rectal cancer.<sup>4</sup> Similar mortality reductions have been observed in the United States, Australia, New Zealand, and Western Europe.<sup>5</sup>

## Colorectal Cancer Screening Program

Screening with fecal tests has been shown to reduce rates of colorectal cancer incidence and mortality.<sup>6,7</sup> As of 2012, organized colorectal cancer screening programs were available, to some extent, in eight provinces, British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Nova Scotia, Prince Edward Island and Newfoundland and Labrador.

The monitoring and evaluation of colorectal cancer screening programs provides an important opportunity to understand the impact of organized screening on colorectal cancer morbidity and mortality, as well as the potential risks associated with screening for colorectal cancer. Systematic evaluation will provide evidence to support ongoing program development and inform best practice, to ensure all screen-eligible Canadians have access to high-quality, effective colorectal cancer screening programs.

## Quality Indicator Framework

This report presents colorectal cancer screening program quality indicators in Canada for the calendar years 2011 and 2012. It builds on the 2009–2010 report,<sup>8</sup> which described the first round of screening. Data are provided for Saskatchewan, Manitoba, Ontario, Nova Scotia, Prince Edward Island and Newfoundland and Labrador. The evaluation framework includes 12 quality indicators that were measured in the previous report, as well as three additional indicators (retention rate, 14 day unplanned hospitalization after follow-up colonoscopy, and interval colorectal cancer rate).

## Results

Screening program participation rates in all provinces have not yet reached the national target of  $\geq 60\%$ , ranging from 12.1% in Manitoba to 36.3% in Saskatchewan. Participation was highest in individuals aged 60–64 years (22.8%) and 70–74 years (25.6%); it was higher in women than in men across all age groups. Screening retention using a 30-month interval ranged from 54.3% in Manitoba to 70.7% in Saskatchewan, and generally increased with age. Fecal test utilization rates in 2012 (including both programmatic and non-programmatic screening) increased from 2008 for all provinces and territories, ranging from 12.8% in Quebec to 51.4% in Manitoba.

The fecal test inadequacy rate met the target of  $\leq 5\%$  in all reporting provinces, ranging from 1.2% in Prince Edward Island to 2.2% in Manitoba. The positivity rate varied by type of fecal test; rates were relatively stable in provinces using the guaiac fecal test (FTg) (2.7% to 4.2%), but showed more variation in provinces using the immunochemical fecal test (FTi) (4.7% to 13.8%). Consistent with the previous report, overall positivity rates were higher in men (5.3%) than in women (3.6%) and increased with age, particularly for those tested with FTi.

The overall rate of follow-up colonoscopy uptake was 75.3%, decreasing from 80.5% in 2009–2010. Rate of uptake varied by province, with only Newfoundland and Labrador meeting the national target of  $\geq 85\%$  within 180 days of an abnormal fecal test. No provinces met the national target of  $\geq 90\%$  within 60 days for the wait time from abnormal fecal test to follow-up colonoscopy; the median was close to the target in Nova Scotia (63 days) and Manitoba (70 days), but substantially higher in the four remaining provinces (ranging from 113 to 159 days). The wait time from follow-up colonoscopy to definitive diagnosis also varied by province; the 90<sup>th</sup> percentile ranged from five days in Saskatchewan to 22 days in Manitoba. As in 2009–2010, no deaths were reported by the three reporting provinces within 30 days of follow-up colonoscopy following an abnormal fecal test.

The national target for positive predictive value (PPV) for adenomas is  $\geq 35\%$  for FTg, and  $\geq 50\%$  for FTi. Manitoba as well as Newfoundland and Labrador met the PPV target for adenoma and neoplasia, and Nova Scotia met the target for adenoma. PPV also increased with age, and was higher in men. The detection rate for adenoma was 10.2 per 1,000 for FTg and 20.7 per 1,000 for FTi, and was similarly higher in men and older age groups.

The detection rate for invasive colorectal cancer was 1.3 per 1,000 for FTg and 1.7 per 1,000 for FTi; this is below the national target of  $\geq 2$  per 1,000. The detection rate was higher in men than in women, and generally increased with age. Over 70% of screen-detected invasive colorectal cancers were early-stage (I or II), increasing from 64.6% in 2009–2010. Data were only available on the interval colorectal cancer rate from Ontario (1.7%), precluding provincial comparison.

## Summary

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The evidence derived from ongoing monitoring of quality indicators in organized colorectal cancer screening provides support that enables governments, regional cancer agencies, screening program managers, health professionals, and other stakeholders in efforts to ensure that high-quality cancer screening services are delivered to Canadians. As colorectal cancer screening programs continue to expand, current quality indicators and targets will be refined, and new quality indicators will be developed. This will contribute to a comprehensive understanding of the impact of screening programs on the burden of colorectal cancer in Canada.

# Introduction

*Despite recent advances in diagnostic and therapeutic strategies, colorectal cancer continues to be a global health problem. In fact, the disease remains one of the major causes of cancer-related morbidity and mortality in the developed world.*

Over the past few decades, specific jurisdictions have reported an overall decline in age-standardized rates of colorectal cancer incidence and mortality.<sup>1,3,5,9</sup> This trend, which exists largely within developed countries, has been attributed in part to the increased uptake of colorectal cancer screening, along with changing population prevalence of risk factors for colorectal cancer, as well as advances in treatment.

The disease has a significant impact on Canadians.

- Colorectal cancer is currently the third most common cancer (after breast cancer in women, prostate cancer in men, and lung cancer in both sexes).<sup>1</sup>
- It is the second leading cause of cancer-related deaths in the country.<sup>1</sup>
- In 2014, an estimated 24,400 Canadians will be diagnosed with colorectal cancer. More than nine out of ten (93%) of these cases will occur in people age 50 years or older.<sup>1</sup>
- In 2014, approximately 9,300 people will die from colorectal cancer.<sup>1</sup>

Current guidelines recommend the use of fecal testing, which looks for the presence of blood in a person's stool as a possible early sign of colorectal cancer. Other more invasive tests such as flexible sigmoidoscopy or

colonoscopy may be recommended at regular intervals starting at age 50 in people considered to be above average risk for developing colorectal cancer.

These tests allow for the early identification and removal of pre-cancerous polyps. Removal of pre-cancerous lesions can decrease the incidence of colorectal cancer. Screening may also reduce colorectal cancer mortality by detecting cancers at an earlier stage when they are more treatable. A meta-analysis of randomized controlled trials demonstrated a 15% reduction in colorectal cancer mortality attributable to biennial screening with fecal testing.<sup>6</sup>

Although these screening tests are widely recommended, there is evidence that they are still significantly underused. Data from the 2012 Canadian Community Health Survey (CCHS) indicate that fewer than 50% of screen-eligible adults had undergone timely colorectal cancer screening.<sup>11</sup> In Canada, population-based colorectal cancer screening programs are currently in various stages of development across the country.

In the context of a publicly funded healthcare system, it is important to ensure equal access to fecal tests. In addition, when a person's test is abnormal, a follow-up colonoscopy to look for polyps or lesions should be completed within the targeted benchmark of 180 days or less.<sup>12</sup>

This report focuses on reporting quality indicators for programmatic screening (e.g. screening that occurs within an organized, population-based program). This contrasts with screening that takes place outside of such programs (known as non-programmatic screening).

A better understanding of both programmatic and non-programmatic screening practices as they exist across Canada today will facilitate the continued shift towards more organized screening within guidelines (programmatic). Such increased population coverage should allow more Canadians to be protected from developing or dying from colorectal cancer. It will also encourage more comprehensive monitoring and evaluation to ensure delivery of high-quality screening services.

In this report, we will:

- review the current state of population-based colorectal cancer screening programs that exist in provinces and territories across Canada
- deliver an update on key quality indicators and targets achieved by the various jurisdictions in Canada which submitted data
- take a closer look at what happens after an abnormal fecal test result, including wait times for follow-up colonoscopy
- provide a brief synopsis of what lies ahead in colorectal cancer screening from the perspective of individual provinces and territories

# Colorectal Cancer Screening in Canada

*There is strong evidence that regular screening using fecal tests (FTs) enables early detection of pre-cancerous or cancerous lesions. This allows for earlier and more successful treatment, leading to an overall reduction in mortality. Screening can also lower the incidence of colorectal cancer through the early detection of pre-cancerous polyps, which can be removed before they become cancerous.<sup>6</sup>*

Once a fecal test result comes back as abnormal – that is, the presence of blood in the person’s stool sample may suggest a lesion – a follow-up colonoscopy is recommended.

Because both fecal testing and colonoscopy are performed on people without any obvious symptoms, it is vital that screening programs maintain a balance between possible benefits and potential harms.

**Possible benefits** would include the ability to find and remove polyps in the colon which can become malignant; or finding an early cancer so treatment can begin immediately.

**Potential harms** revolve around the frequency of false positive fecal test results (i.e. the test suggests a problem where none exists) and the invasive nature of colonoscopy which could result in complications, such as bleeding and perforation.

We believe organized population-based programs can achieve this balance because they include an administrative structure responsible for service delivery, quality assurance and ongoing evaluation.<sup>13</sup>

**FIGURE 1**  
**Colorectal cancer screening program availability as of December 31, 2012**

% of population where organized CRC screening programs are available as of December 31, 2012:



By December 31, 2012, colorectal cancer screening was available in eight provinces.

- Alberta, Manitoba, Ontario, and Prince Edward Island offered province-wide programs.
- Due to the phased-in approach in Nova Scotia, although CRC screening was available province wide, program invitations to the target age group was not yet at 100%.
- Saskatchewan and Newfoundland and Labrador provided screening in targeted regions as a phased-in approach to eventual province-wide screening.
- British Columbia was engaged in a pilot program that covered 1 to 9% of the population; their data are not included in this report.

The provinces and territories continue working to adopt and/or establish best practices in recruitment, testing, education and communication with health-care providers and the general public.

# Colorectal Cancer Screening Pathway

*Fecal tests are the central step in the colorectal cancer (CRC) screening process.*

Organized screening for colorectal cancer involves five steps:

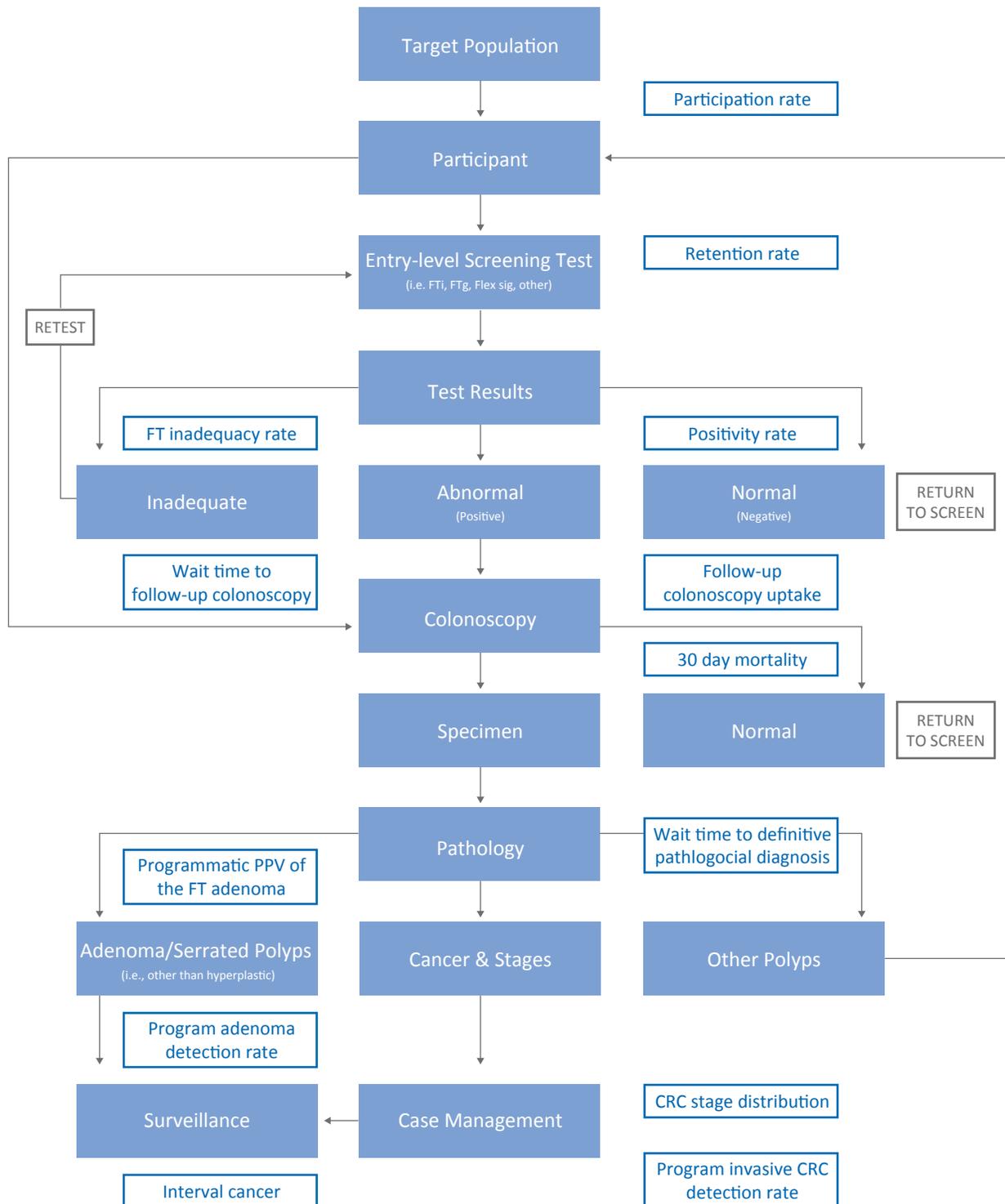
- Identifying people who could benefit from colorectal cancer screening
- Inviting the target population to be screened
- Providing the appropriate screening tests to the target population
- Timely follow-up when abnormalities are detected via screening
- Contacting people who have tested negative (i.e. no abnormalities detected) to be tested again at recommended intervals

Currently Canadian provinces that provide colorectal cancer screening programs use either guaiac (FTg) or immunochemical (FTi) FTs as the screening test. Of note, the FTi is increasingly being implemented in most jurisdictions because of its higher sensitivity. In either case, people provide a stool sample. The sample is tested for specific markers – the presence of microscopic amounts of blood – which may signal an abnormality in the bowel.

Those targeted for regular screening are people aged 50 – 74 years at average risk for colorectal cancer. This means they have no personal or significant family risk factors for colorectal cancer other than being 50 years or older.

Individuals with a positive FT result are then referred for a colonoscopy. Figure 1 outlines the colorectal cancer screening pathway. Colonoscopy is recommended as the screening test for individuals at above average risk of colorectal cancer.<sup>14</sup>

**FIGURE 2**  
**The colorectal cancer screening pathway<sup>14</sup>**



# National Colorectal Cancer Screening Network

*Throughout Canada, greater attention has been dedicated to organized screening for colorectal cancer. Much of the progress made in this area has been through the collaborative efforts of the National Colorectal Cancer Screening Network.*

In 2007, the National Colorectal Cancer Screening Network (NCCSN) was convened through the Canadian Partnership Against Cancer (the Partnership). Creation of the NCCSN resulted in increased attention to and focus on providing organized CRC screening to Canadians. The NCCSN brings together representatives from the following areas:

- provincial screening program staff
- provincial and territorial governments
- the Canadian Cancer Society
- the Public Health Agency of Canada
- the Canadian Cancer Action Network
- the Canadian Medical Association
- the Colorectal Cancer Association of Canada
- the Canadian Association of Gastroenterology

The mandate of the NCCSN is to develop a shared approach to planning and implementing CRC screening across the country. When the NCCSN was formed, three provinces had announced the establishment of CRC screening programs. Since then, CRC screening has expanded so that all 10 provinces have announced screening programs and development work has started in the territories.

Reporting on program performance nationally and setting targets for performance (i.e. specifically for the purpose of quality improvement) are priorities for the NCCSN. An NCCSN monitoring and evaluation working group is dedicated to the ongoing development of these priorities in four distinct categories:

- developing quality determinants for colorectal cancer screening in Canada
- monitoring program performance through the identification of quality indicators (based on the quality determinants)
- reporting results at regular intervals
- setting national targets

A set of quality indicators for colorectal cancer screening was developed in 2009 for reporting at the national level. Subsequent work in 2011 resulted in the definition of targets for six of the indicators. In 2013, the Partnership released an updated version of the publication “Quality Determinants and Indicators for Measuring Colorectal Cancer Screening Program Performance in Canada.”<sup>12</sup> Appendix B provides a list of the quality indicators included in this report.

# Intent of this Report

*The findings presented in this report will assist in the advancement of program development and quality monitoring in organized colorectal cancer screening programs throughout Canada.*

Since screening programs for colorectal cancer were first introduced in Canada in 2007, a great deal of work has been done to identify a set of indicators that could be used to measure and compare screening activities across the country. The National Colorectal Cancer Screening Network has been organized to: encourage greater collaboration between jurisdictions; share lessons learned; and develop a set of best practices for colorectal cancer screening. These efforts are aimed at enabling higher-quality screening programs, earlier detection of colorectal cancers, and more opportunities for prevention and effective treatment.

This report presents results for key indicators and targets for provinces that were able to provide data from January 1, 2011, to December 31, 2012. While six provinces submitted data for this report (an increase from five in the initial report published in 2013) not all the indicators could be reported on by all six provinces. The provinces that submitted data for some, if not all indicators, were Saskatchewan, Manitoba, Ontario, Nova Scotia, Prince Edward Island and Newfoundland and Labrador.

This report ends by highlighting a special topic, specifically “wait times to colonoscopy.” Provinces and territories were asked to provide commentaries on several issues, including: their views on current wait times to colonoscopy; processes for follow-up after an abnormal fecal test; and strategies for improving wait times and tracking results.

# Quality Indicators

*Colorectal cancer screening programs across Canada have evolved at different rates and are shaped by provincial and territorial characteristics and factors, including the adoption of different screening models among the provinces and territories. Therefore, the results that follow should be interpreted cautiously within this context.*

# Participation Rate

*Participation Rate is defined as the percentage of the target population who successfully completed at least one fecal occult blood test (guaiac – FTg or immunochemical – FTi) in the program within the measurement timeframe (January 2011 – December 2012).*

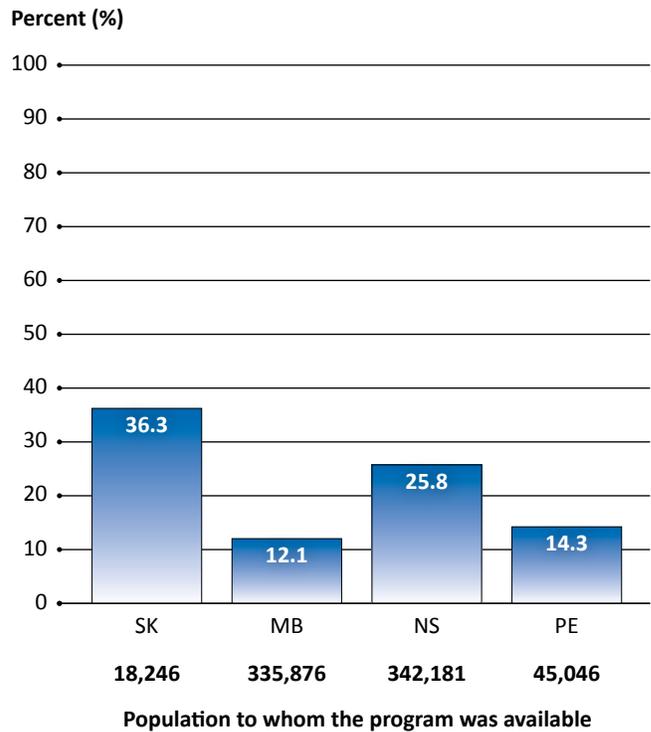
Participation has not yet reached the target of 60%. As screening programs become more established throughout Canada, participation is expected to increase.

## Participation Rate Calculation

- Numerator: Number of individuals within the target population that had at least one FT in the program, within the measurement timeframe.
- Denominator: Number of individuals within the target population, to whom the program was available, within the same measurement timeframe as numerator.

FIGURE 3

### Colorectal cancer screening participation among individuals to whom the screening program was available, by province, January 1, 2011 to December 31, 2012



SK data include one health region.

NS participation rate shown in Figure 5 is a more accurate representation of the true programmatic participation in NS, given that individuals can only participate once they have been mailed an invite and screening test from the program.

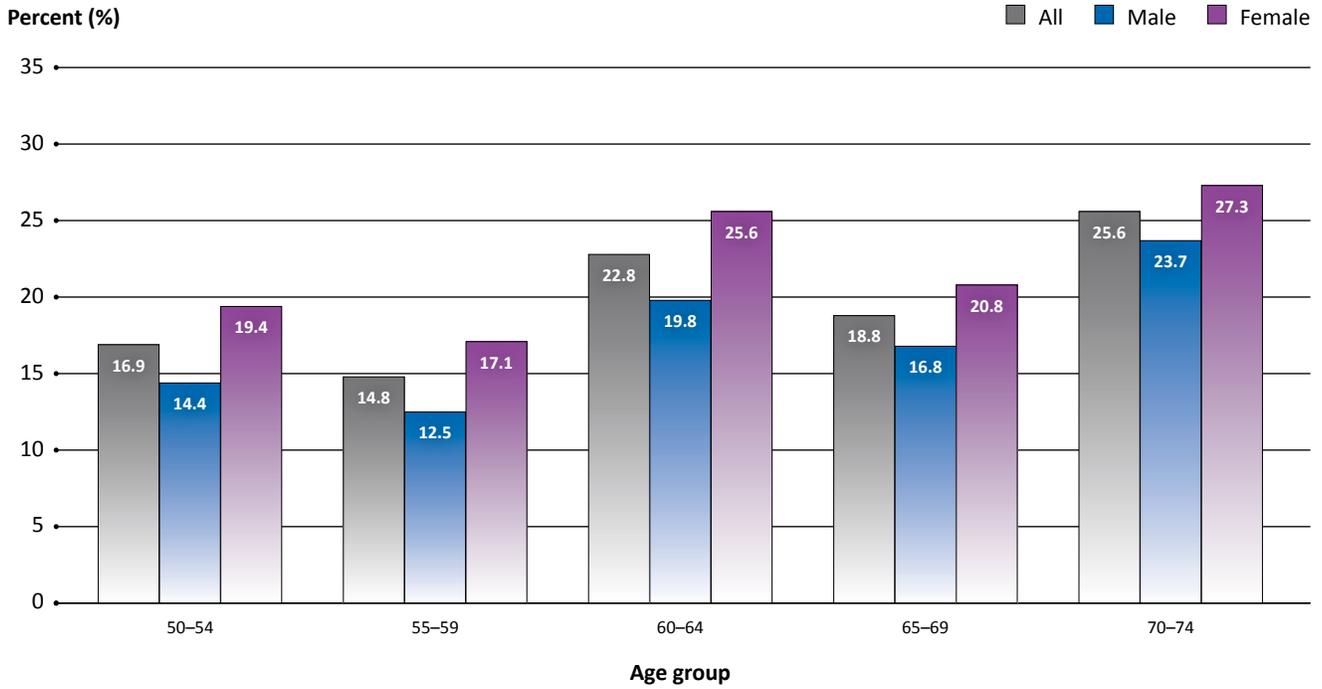
PE data are for May 1, 2011 – Dec. 31, 2012. FTg was discontinued by June of 2012 after transition to FTi. FTi was implemented in early 2012.

NL data only available for last five months of the reporting period and would not reflect program participation.

Participation in screening for colorectal cancer through organized programs ranged from 12.1% in Manitoba to 36.3 % in Saskatchewan.

FIGURE 4

**Participation in colorectal cancer screening, by age group and sex, January 1, 2011 to December 31, 2012**

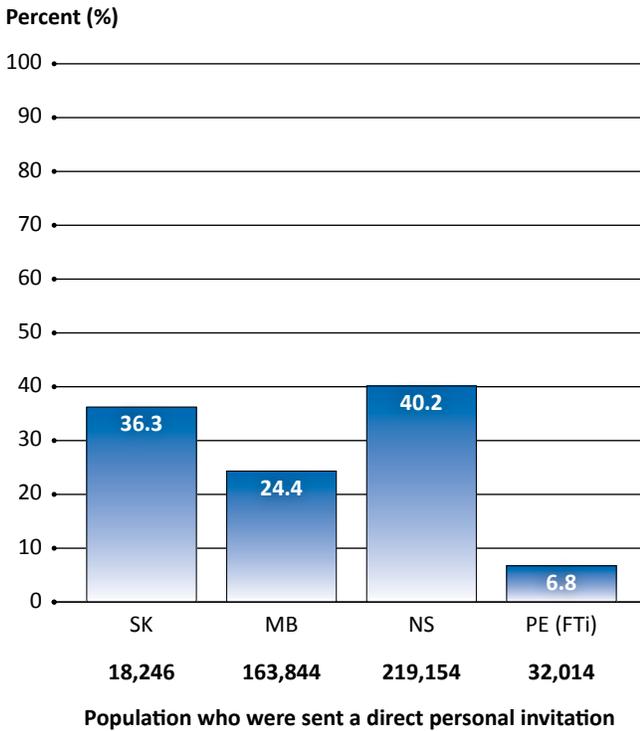


Data include SK, MB, NS and PE.  
 SK data include one health region.  
 NS has an invitation only screening program.  
 PE data are for May 1, 2011 – Dec. 31, 2012. FTg was discontinued by June of 2012 after transition to FTi. FTi was implemented in early 2012.

Overall participation was highest in the 70 to 74 age group.  
 It was also higher among women than among men.

FIGURE 5

**Colorectal cancer screening participation among individuals who were sent a direct personal invitation, by province, January 1, 2011 to December 31, 2012**



SK data include one health region.  
 NS has an invitation only screening program.  
 PE data for FTg are not available. FTi was implemented in early 2012. Invitations were sent out for age 50–64 only during the timeframe.

There are many strategies for improving the uptake of fecal testing by the target population. Common strategies include general media, printed promotional materials, and direct correspondence.

Figure 5 shows the participation results of those receiving personalized invitations.

Participation rates among people sent a direct personal invitation varied widely – from 6.8% in Prince Edward Island to 40.2% in Nova Scotia.

# Retention Rate

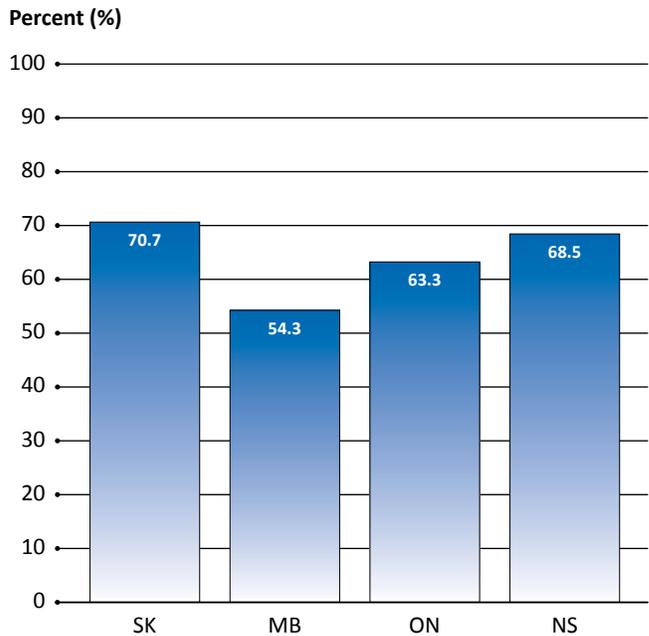
*Retention rate is defined as the proportion (expressed as percentage) of individuals who had a normal screening test who were rescreened within the measurement timeframe.*

## Retention Rate Calculation

- Numerator: Number of individuals with at least one FT in the program within the measurement timeframe (January 1, 2011 – December 31, 2012) who also had a previous successful FT in the program 24 to 30 months prior.
- Denominator: Number of individuals with normal FT results obtained between January 1, 2009 and December 31, 2010.

Data are available for four programs, two using FTg (MB, ON) and two using FTi (NS, SK); Ontario accounted for 86.6% of all FOBT negative cases for whom data were available.

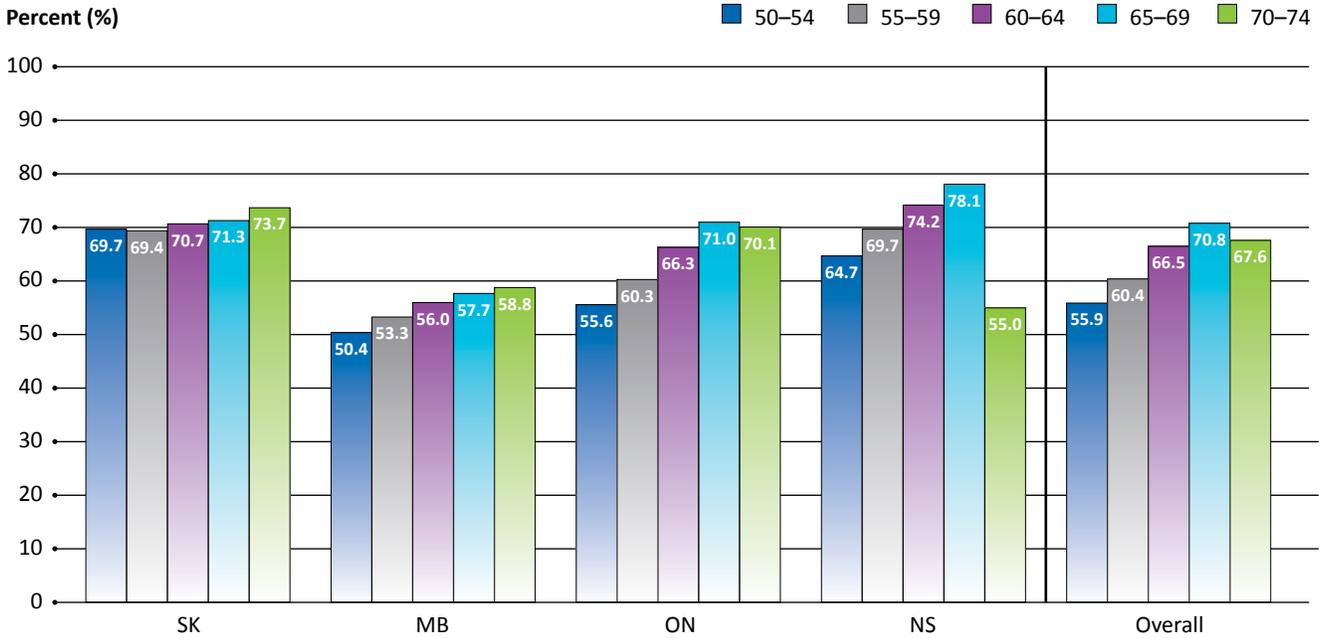
**FIGURE 6**  
**30 month retention rate by province**



SK data include one health region.  
 ON initial fecal data are for 2009.  
 Exclusions: individuals with a missing or invalid HIN, date of birth, sex, postal code, individuals with a previous invasive colorectal cancer or a previous colectomy, individuals who had colonoscopy and flexible sigmoidoscopy during the follow-up period.

Retention rates varied markedly between programs. In general retention rates increased progressively from age 50–54 through to age 65–69. Data were limited for people over age 70. Reported retention rates may be less reliable for those in the 70–72 age group.

**FIGURE 7**  
**30 month retention rate by province and age group**



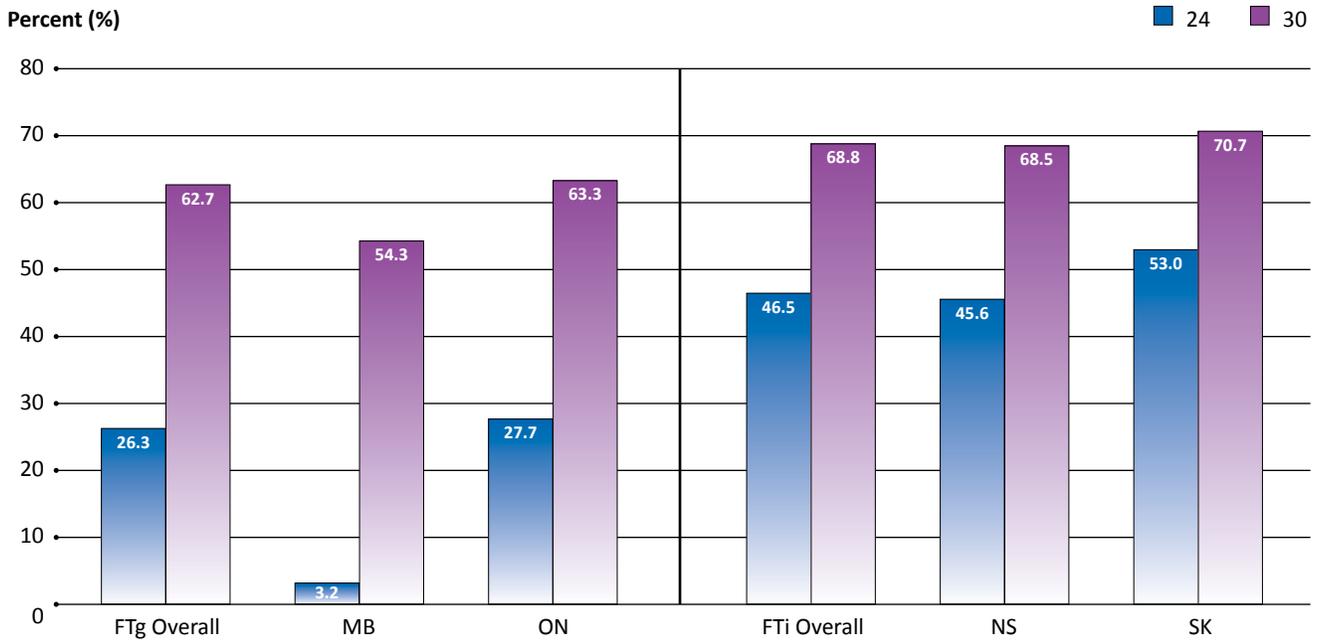
Overall data include SK, MB, ON and NS.

SK data include one health region.

ON initial fecal test data are for 2009. Exclusions: individuals with a missing or invalid HIN, date of birth, sex, postal code, individuals with a previous invasive colorectal cancer or a previous colectomy, individuals who had colonoscopy and flexible sigmoidoscopy during the follow-up period.

FIGURE 8

**Retention rate: proportion of FT negative people who had a repeat test within 24 and 30 months**



Retention rates for programs offering screening every two years should be assessed at least six months after the scheduled follow-up test; there are no data here to indicate whether the delay should be shorter or longer (i.e. more or less than 30 months after the previous negative screening test).

There is no indication that the retention rates are associated with the type of test used.

# Fecal Test Utilization

Fecal test (FT) utilization is defined as the percentage of the target population that has successfully completed at least one FT, either programmatic or non-programmatic. This information may be available from a variety of sources, including screening programs, fee-for-service data and self-reported data.

As organized colorectal cancer (CRC) screening programs develop, it is important to recognize that a portion of CRC screening occurs outside organized screening programs. The utilization of CRC screening is evaluated to reflect screening as a whole in the population. Doing so assists in developing a fuller understanding of screening practices in

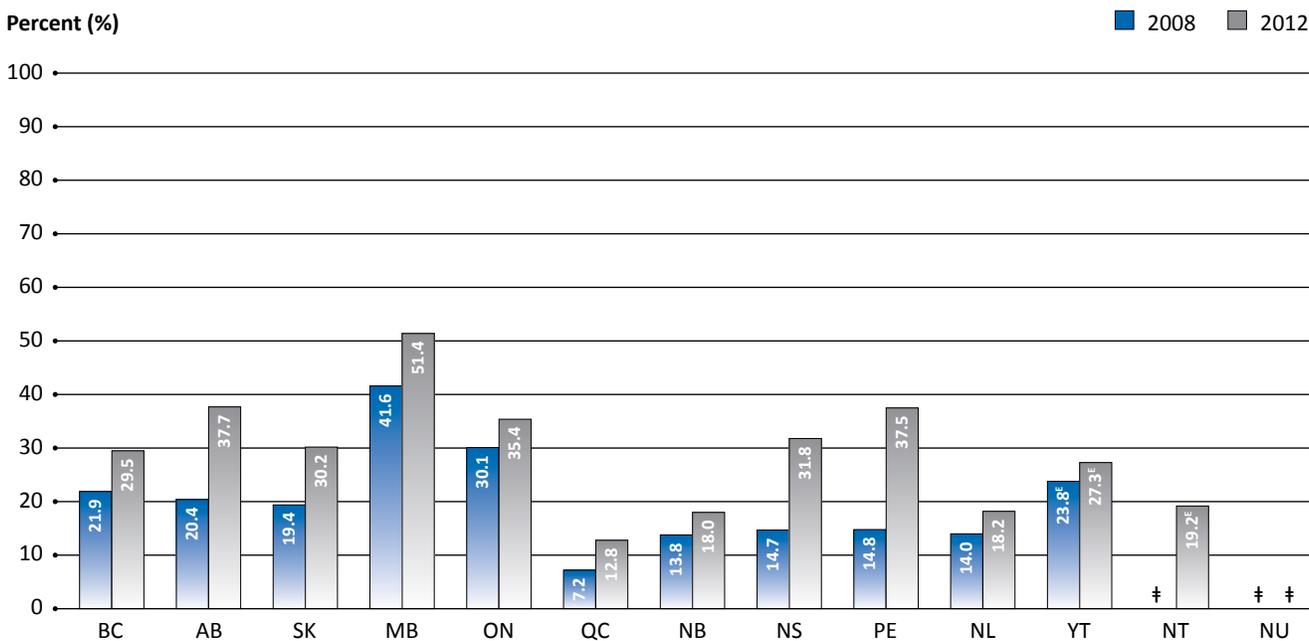
Canada and making the eventual shift toward organized programmatic screening.

It is expected that utilization will be more widely reported as the ability to collect information grows within the programs. Until that time, national surveys will be used to reflect FT utilization in Canada.

Figure 9 shows the percentage of Canadians aged 50–74 at average risk for colorectal cancer who reported having a fecal test in the past two years (data from 2008 and 2012). In 2008, fecal test utilization ranged from 7.2% in Quebec to 41.6% in Manitoba. In 2012, fecal test utilization ranged from 12.8% in Quebec to 51.4% in Manitoba.

FIGURE 9

**Percentage of population aged 50–74 that reported having had a screening<sup>†</sup> fecal test in the last two years, by province/territory – 2008 and 2012 reporting years**



‡ Suppressed due to statistical unreliability caused by small numbers.  
 † Interpret with caution owing to large variability in the estimate.

† Excludes tests done to investigate symptoms.  
 Data source: Statistics Canada, Canadian Community Health Survey

Surveys such as the Canadian Community Health Survey (CCHS) and the Colorectal Cancer Screening in Canada Survey provide valuable insight into self-reported screening behaviours. They also reflect perceptions, attitudes and willingness of respondents to participate in

regular CRC screening. These data provide an additional opportunity to understand population-based screening behaviours and account for people who may be up-to-date with screening due to endoscopy.

# Fecal Test Inadequacy Rate

*This is defined as the proportion (expressed as percentage) of individuals whose FT was inadequate and who have not repeated the test to get a successful FT result.*

FT Inadequacy Rates varied among the reporting provinces and all met the target of 5% or less.

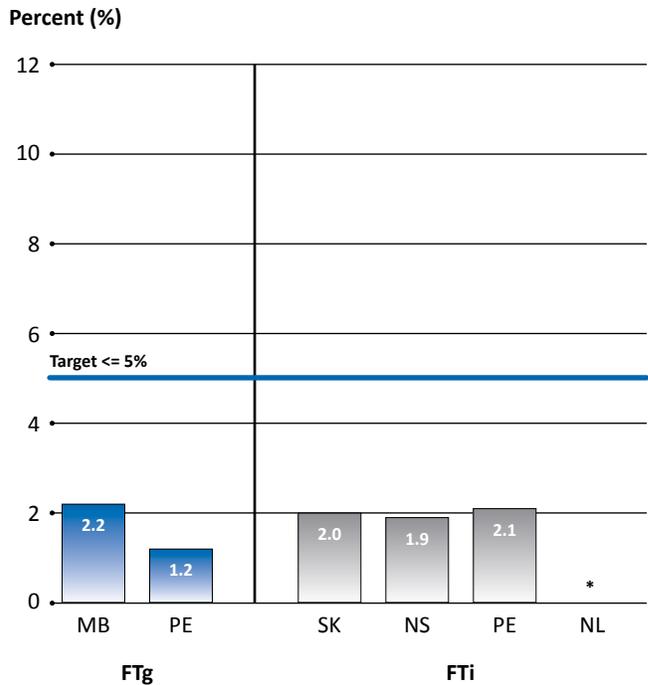
The FT Inadequacy Rate provides information about the successful completion of the process of performing the FT by the targeted population. Factors that may influence inadequate results may include improper fecal sampling, missing participant information, or quality assurance issues associated with the laboratory or vendor. Understanding these factors enables programs to develop strategies for enhancing participant education for effective sampling and labeling as well as quality improvement methodologies for processing the FT.

## Fecal Test Inadequacy Rate Calculation

- Numerator: Number of individuals that had an inadequate FT who have not repeated the test to obtain a successful FT laboratory result within the measurement timeframe.
- Denominator: Number of individuals that had an FT within the same measurement timeframe as the numerator.

FIGURE 10

**Fecal test inadequacy rates by test type and province, January 1, 2011 to December 31, 2012**



FTg=guaiac fecal test; FTi=immunochemical fecal test

\* Suppressed owing to small numbers.

SK data include one health region.

PE data are for May 1, 2011 – Dec. 31, 2012. FTg was discontinued by June of 2012 after transition to FTi. FTi was implemented in early 2012.

NL data are for the final 5 months of the reporting period, in one health region.

Fecal test inadequacy rates ranged from 1.2% in Prince Edward Island to 2.2% in Manitoba (Figure 10).

# Positivity Rate

Positivity rate is defined as the percentage of individuals with an abnormal FT result.

## Positivity Rate Calculation:

- Numerator: Number of individuals that had an abnormal FT laboratory result within the measurement time frame of January 1, 2011 to December 31, 2012. (Tests with equivocal results are excluded.)
- Denominator: Number of individuals that had at least one successful FT processed by the laboratory with the same measurement timeframe as the numerator.

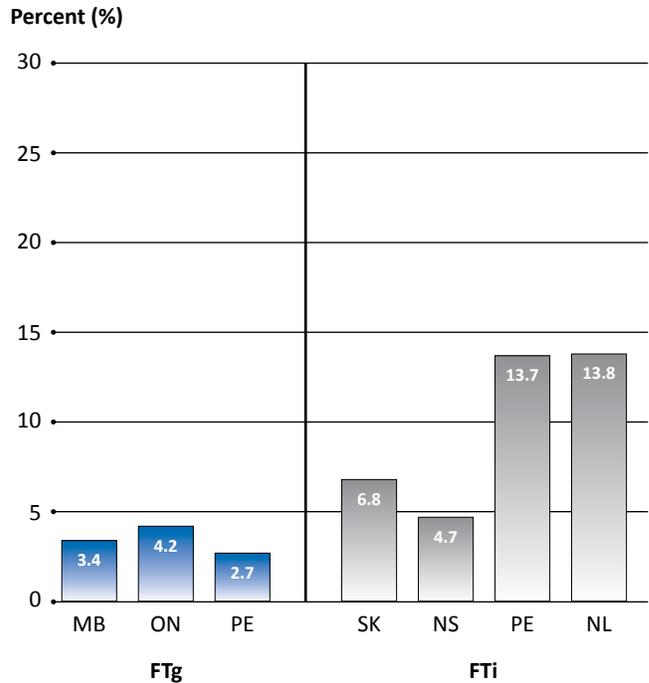
In the six reporting provinces, the positivity rate differed according to the type of FT used. For the provinces that used an FTg test, positivity rate ranged from 2.7% in Prince Edward Island to 4.2% in Ontario.

The positivity rates varied more noticeably among the provinces using FTi – from 4.7% in Nova Scotia to 13.8% in Newfoundland and Labrador.

It is recognized that some factors may influence the range of positivity when FTi is used. These factors include cut-off values (the number above or below which the test is considered positive), the number of fecal samples required, and the type of FTi being utilized.

FIGURE 11

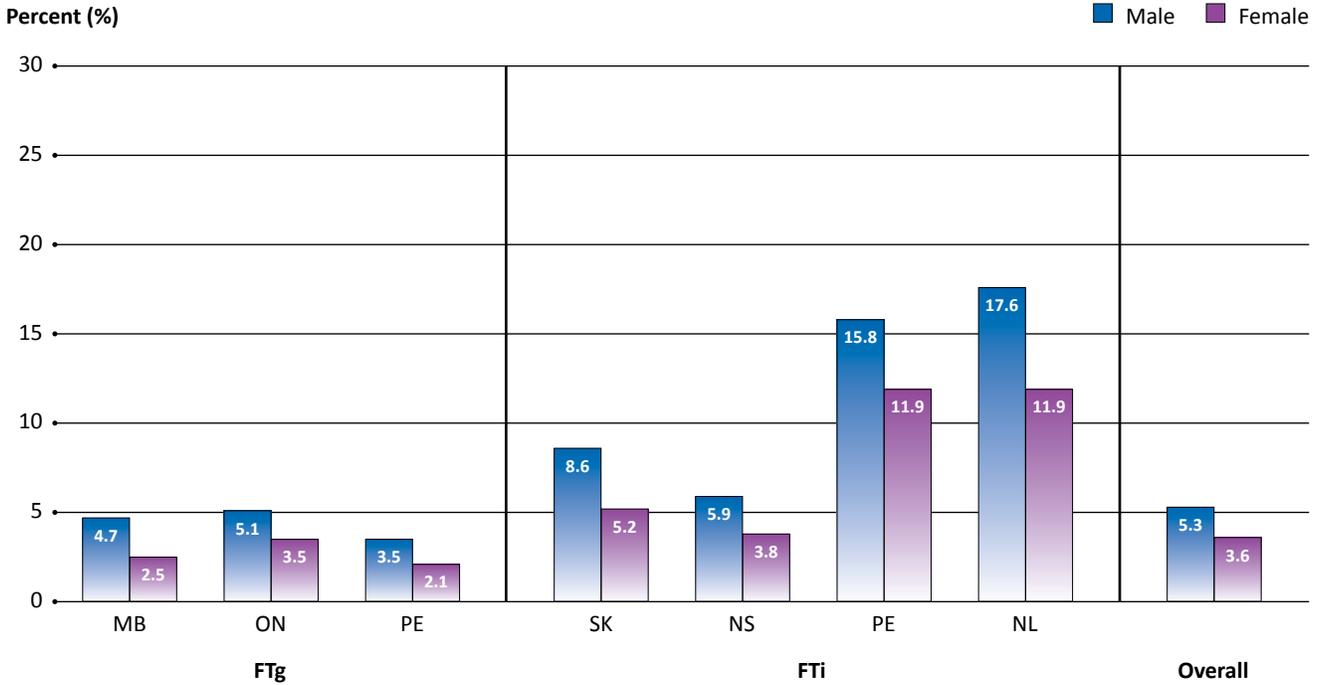
**Positivity rate by fecal test type and by province, January 1, 2011 to December 31, 2012**



FTg=guaic fecal test; FTi=immunochemical fecal test  
 ON data are for Jan. 2011 – Dec. 2011. Exclusions: individuals with a missing or invalid HIN, date of birth, sex, postal code, individuals with a previous invasive colorectal cancer or a previous total colectomy, individuals who returned kits that were ejected or indeterminate.  
 PE data are for May 1, 2011 – Dec. 31, 2012. FTg was discontinued by June of 2012 after transition to FTi. FTi was implemented in early 2012.  
 SK data include one health region.  
 NL data are for the final 5 months of the reporting period, in one health region.

FIGURE 12

**Positivity rate by fecal test type, province and sex, January 1, 2011 to December 31, 2012**



FTg=guaiaic fecal test; FTi=immunochemical fecal test

Overall data include MB, ON, PE, SK, NS and NL.

ON data are for Jan 2011 – Dec 2011. Exclusions: individuals with a missing or invalid HIN, date of birth, sex, postal code, individuals with a previous invasive colorectal cancer or a previous total colectomy, individuals who returned kits that were rejected or indeterminate.

PE data are for May 1, 2011 – Dec. 31, 2012. FTg was discontinued by June of 2012 after transition to FTi. FTi was implemented in early 2012.

SK data include one health region.

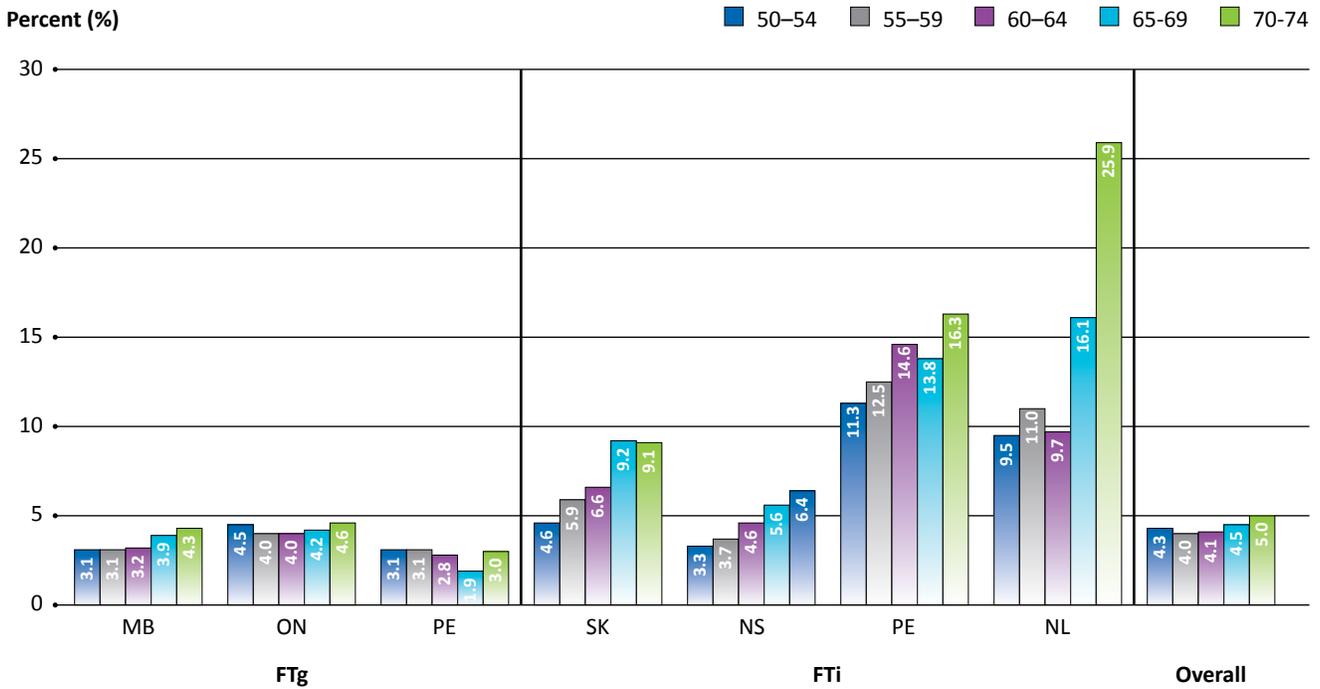
NL data are for the final 5 months of the reporting period, in one health region.

Positivity rates were higher in males in all provinces reporting the results of fecal testing.

The overall combined positivity rate for males was 5.3%, compared to 3.6% for females.

FIGURE 13

**Positivity rate by fecal test type, province and age group, January 1, 2011 to December 31, 2012**



FTg=guaiaic fecal test; FTi=immunochemical fecal test

Overall data include MB, ON, PE, SK, NS and NL.

ON data are for Jan 2011 – Dec 2011. Exclusions: individuals with a missing or invalid HIN, date of birth, sex, postal code, individuals with a previous invasive colorectal cancer or a previous total colectomy, individuals who returned kits that were rejected or indeterminate.

PE data are for May 1, 2011 – Dec. 31, 2012. FTg was discontinued by June of 2012 after transition to FTi. FTi was implemented in early 2012.

SK data include one health region.

NL data are for the final 5 months of the reporting period, in one health region.

Positivity rates increased with age, particularly for those who underwent immunochemical fecal testing.

## Follow-up Colonoscopy Uptake

*Follow-up Colonoscopy Uptake is defined as the percentage of individuals with an abnormal FT result that had a follow-up colonoscopy within 180 days.*

Uptake of follow-up colonoscopy varied among the provinces; only one province (Newfoundland and Labrador) reached the target.

The target for this indicator is  $\geq 85\%$ .

### Follow-Up Colonoscopy Uptake Calculation

- Numerator: Number of individuals with an abnormal FT laboratory result within the measurement timeframe, having a follow-up colonoscopy within 180 days of the date of the abnormal FT laboratory result. (Incomplete colonoscopies are included; any colonoscopy after 180 days from the abnormal FT is excluded, even if it is the first and only colonoscopy.)
- Denominator: Number of individuals with an abnormal FT laboratory result within the same measurement timeframe as the numerator.

TABLE 1

### Follow-up colonoscopy uptake within 180 days, by province and overall, by sex and by age group (January 1, 2011 to December 31, 2012)

Follow-up colonoscopy uptake (%) Target $\geq 85\%$	SK	MB	ON	NS	PE	NL	Overall
<b>All participants</b> (number of Follow-up colonoscopies/ number of abnormal FT)	70.3 (312/ 444)	78.6 (1,068/ 1,358)	74.6 (15,472/ 20,740)	80.1 (3,249/ 4,055)	61.1 (322/ 527)	88.4 (76/ 86)	<b>75.3</b> <b>(20,499/ 27,210)</b>
<b>Male</b>	72.3	77.7	74.7	81.3	60.1	88.9	<b>75.5</b>
<b>Female</b>	67.2	80.1	74.5	78.8	62.2	88.0	<b>75.1</b>
<b>Ages 50–54</b>	73.5	81.2	76.2	81.7	65.8	87.5	<b>76.8</b>
<b>Ages 55–59</b>	75.7	79.8	74.6	83.4	49.6	93.8	<b>75.3</b>
<b>Ages 60–64</b>	66.1	80.5	75.5	81.8	65.5	66.7	<b>76.4</b>
<b>Ages 65–69</b>	64.4	76.0	73.4	79.5	64.8	92.0	<b>74.3</b>
<b>Ages 70–74</b>	73.8	74.5	72.0	76.5	60.9	95.5	<b>73.1</b>

Overall: Data include SK, MB, ON, NS, PE and NL.

SK data include one health region.

ON data are for Jan. 2011 to Dec. 2011. Exclusions: individuals with a missing or invalid HIN, date of birth, sex, postal code, individuals with a previous invasive colorectal cancer or a previous total colectomy.

NS data only include programmatic colonoscopies.

PE data are for May 1, 2011 – Dec. 31, 2012. FTg are for May 1, 2011 – July 1, 2012, FTi are for 2012 only.

NL data are for the final 5 months of the reporting period, in one health region.

A total of 27,210 individuals in the six provinces submitting data had abnormal fecal test results during the reporting period.

Of those testing abnormal, 75.3% had a follow-up colonoscopy within the national target of 180 days from the date of their abnormal fecal test result.

Follow-up colonoscopy uptake after an abnormal test ranged from a low of 61.1% in Prince Edward Island to a high of 88.4% in Newfoundland and Labrador.

Newfoundland and Labrador was the only reporting province that reached the 85% target for follow-up colonoscopy uptake after an abnormal fecal test, although this was based on a very low volume.

# Wait Times to Follow-up Colonoscopy

*Wait times to follow-up colonoscopy is defined as the time from an abnormal FT result to follow-up colonoscopy.*

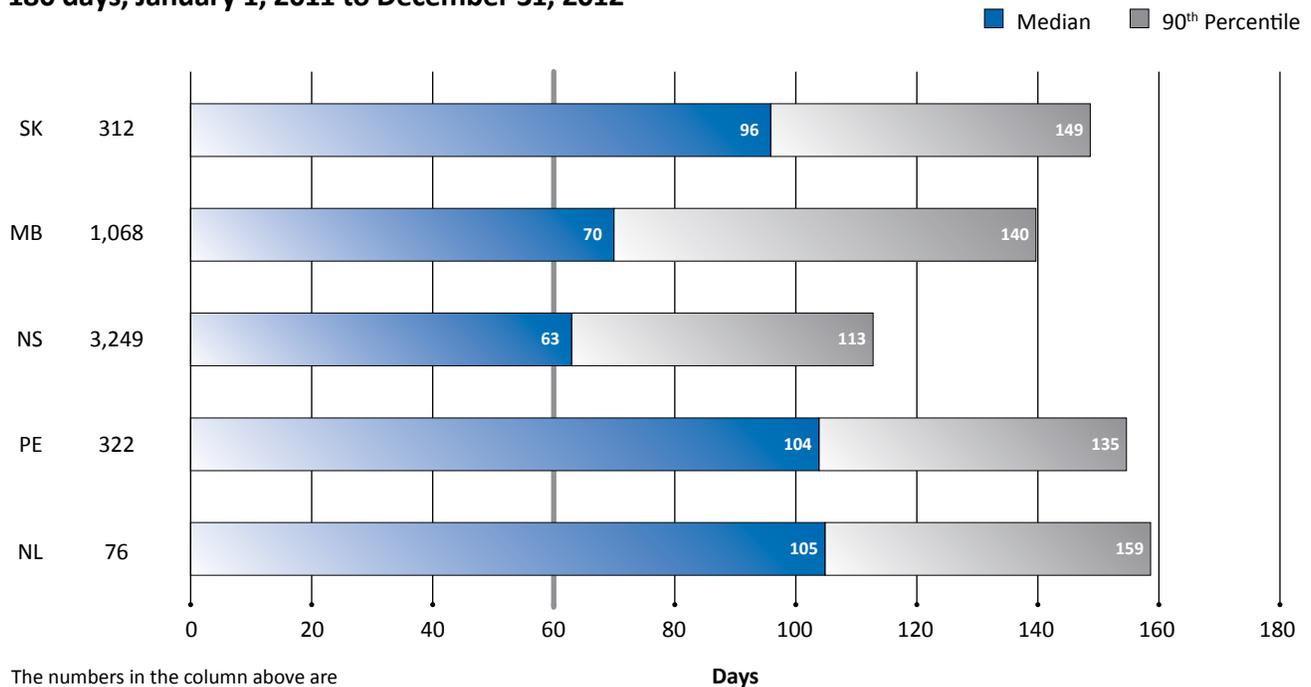
The national target for this indicator is  $\geq 90\%$  within 60 days of an abnormal FT.

The date of the abnormal FT is defined as the date the result is reported by the laboratory for each individual test of the cohort; if there is more than one abnormal FT, the date of the first test is used.

Among individuals having had a follow-up colonoscopy within 180 days of an abnormal FT in 2011–2012, wait times were near the target of 60 days for half of the individuals (median): in Nova Scotia – 63 days, Manitoba – 70 days. However, the 90<sup>th</sup> percentile in the five reporting provinces indicates that many individuals had to wait twice the recommended number of days, ranging from 113 days to 159 days for the follow-up colonoscopy.

FIGURE 14

**Median and 90<sup>th</sup> percentile for wait times from abnormal fecal test to follow-up colonoscopy within 180 days, January 1, 2011 to December 31, 2012**



The numbers in the column above are the number of individuals having a follow-up colonoscopy within 180 days

SK data include one health region.

FTg was discontinued in PE by June of 2012 after the transition to FTi. FTi was implemented in early 2012.

NL data are for the final 5 months of the reporting period, in one health region.

# 14 Day Unplanned Hospitalization Following Follow-up Colonoscopy

*This indicator is defined as the percent of unplanned hospitalizations within 14 days after a follow-up colonoscopy.*

## **14 Day Unplanned Hospitalization After Follow-Up Colonoscopy Calculation**

- Numerator: Number of individuals who have had unplanned hospitalization within 14 days after having undergone an endoscopic procedure (i.e. where the hospitalization was NOT attributable to surgical or other curative interventions initiated because of a colorectal cancer diagnosis). This includes individuals with an abnormal laboratory FT result within the measurement timeframe having had follow-up colonoscopy within 180 days of the date of the abnormal FT result.
- Denominator: Number of individuals with an abnormal laboratory FT result within the same measurement timeframe as the numerator having follow-up colonoscopy within 180 days of the date of the abnormal FT result.

Only two provinces were able to provide data on this indicator in the measurement timeframe (January 2011 – December 2012). Therefore it is not possible to report on 14 day unplanned hospitalization after a follow-up colonoscopy.

It should be noted that reporting on this indicator requires many steps such as linkage with administrative databases or local follow-up in chart review, and some provinces have not had the resources needed to do this work.

Harm caused by colonoscopy (represented by the percentage of individuals who had unplanned hospitalization due to complications related to colonoscopy within 14 days of the procedure) is not restricted to individuals participating in colorectal cancer screening. This outcome should be evaluated and reported regularly to colonoscopy units. Efforts should be made to capture those data, perhaps in conjunction with the Canadian Association of Gastroenterology.

# 30 Day Mortality Following Follow-up Colonoscopy

*This indicator is defined as a percent mortality within 30 days of a follow-up colonoscopy.*

## **30 Day Mortality Calculation**

- Numerator: Number of individuals deceased from any cause within 30 days of the date of the follow-up colonoscopy. This includes individuals with an abnormal laboratory FT result within the measurement timeframe who had a follow-up colonoscopy within 180 days of the date of the abnormal FT result.

- Denominator: Number of individuals with an abnormal laboratory FT result within the same measurement timeframe as the numerator having a follow-up colonoscopy within 180 days of the date of the abnormal FT result.

No deaths occurred within 30 days among the 710 individuals who proceeded to a follow-up colonoscopy within 180 days of an abnormal FT in the reporting provinces of SK, NL and PE.

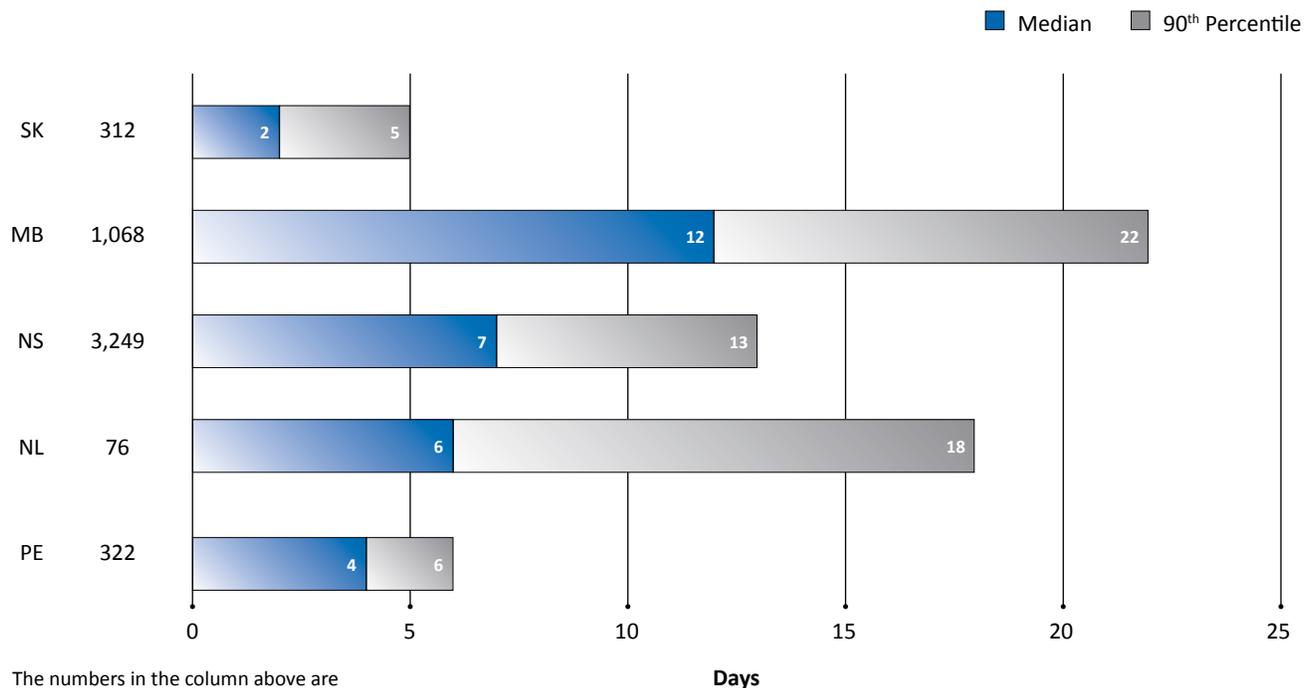
# Wait Times from Follow-up Colonoscopy to Definitive Pathological Diagnosis

*Wait times from follow-up colonoscopy to definitive pathological diagnosis is defined as the time from a follow-up colonoscopy procedure to definitive pathological diagnosis.*

The date of definitive pathological diagnosis refers to the date of the initial pathological report after a complete colonoscopy that confirms the presence (or absence) of colorectal cancer or adenoma.<sup>12</sup>

There is currently no national target for this indicator. However the European Guidelines for Quality Assurance in Colorectal Cancer Screening and Diagnosis (2010)<sup>15</sup> suggests that the diagnosis should be available within 15 days of the colonoscopy.

**FIGURE 15**  
**Median and 90<sup>th</sup> percentile days between abnormal colonoscopy and definitive pathological diagnosis, January 1, 2011 to December 31, 2012**



The numbers in the column above are the number of individuals having a follow-up colonoscopy within 180 days

SK data include one health region.

FTg was discontinued in PE by June of 2012 after the transition to FTi. FTi was implemented in early 2012.

NL data are for the final 5 months of the reporting period, in one health region.

## Positive Predictive Value (PPV) Adenoma(s)

### Programmatic PPV of the FT for Adenoma

*This is defined as the proportion (%) of individuals with an abnormal fecal test, within the measurement timeframe, in whom one or more adenomas were confirmed by pathology at colonoscopy or surgery performed within 180 days of the FT.*

*As illustrated in Appendix D, this is  $(O+P)/C*100$ .*

### PPV of the FT for Adenoma Among Those Who Completed Follow-Up

*This is defined as the proportion (%) of individuals with an abnormal fecal test within the measurement timeframe, who underwent colonoscopy or surgery within 180 days, in whom one or more adenomas are confirmed by pathology.*

*As illustrated in Appendix D, this is  $(O+P)/E*100$ .*

This indicator has a target of  $\geq 35\%$  for FTg and  $\geq 50\%$  for FTi.

### PPV Calculation:

- Numerator: Number of individuals whose pathological specimens removed at endoscopy or surgery have been reported by a pathologist to be adenomatous, from a

follow-up colonoscopy or surgery performed within 180 days of the date of an abnormal laboratory FT result obtained within the measurement timeframe. (All adenomas, advanced or not advanced, are included.)

- Denominator: Number of individuals having a follow-up colonoscopy (or surgery) performed within 180 days of the date of an abnormal laboratory FT result obtained within the same measurement timeframe.

PPV includes the proportion of individuals with an abnormal FT result diagnosed with the following: adenoma(s), advanced adenoma(s), invasive colorectal cancer, neoplasia and advanced neoplasia.

PPV is often used to reflect the probability that a positive test result indicates the underlying condition targeted by screening.

The use and calculation of PPV is not standard among all countries offering programmatic colorectal cancer screening. However, for the purposes of this report, and from the perspective of the Canadian cancer screening programs who submitted data, PPV can assist in showing how many individuals/what percentage of individuals can benefit from programmatic screening.

TABLE 2

### Positive predictive values by province (%), January 1, 2011 to December 31, 2012

Type of lesion	FTg					FTi		Overall
	MB	ON	PE	SK	NS	PE	NL	
Adenoma	39.8	-	20.0	45.8	53.2	33.7	51.3	48.5
Advanced adenoma	20.8	-	†	29.8	34.4	10.5	30.3	29.5
CRC	5.1	4.3	12.7	1.9	-	4.1	†	4.3
Neoplasia*	44.9	-	32.7	47.8	-	37.8	52.6	44.3
Advanced neoplasia**	25.9	-	16.4	31.7	-	14.6	31.6	25.2

FTg=guaiac fecal test; FTi=immunochemical fecal test

- Data are not available.

† Suppressed owing to small numbers.

\* Neoplasia refers to the sum of all adenomas and CRC.

\*\* Advanced neoplasia refers to the sum of advanced adenoma and CRC.

ON data are for Jan 2011-Dec 2011. Exclusions: individuals with a missing or invalid HIN, date of birth, sex, postal code, individuals with a previous invasive colorectal cancer or a previous total colectomy.

PE data are for May 1, 2011 – Dec. 31, 2012. FTg was discontinued in PE by June of 2012 after the transition to FTi. FTi was implemented in early 2012.

SK data include one health region.

NL data are for the final 5 months of the reporting period, in one health region.

With the exception of Positive Predictive Value Invasive Colorectal Cancer (PPV-CRC), the PPVs for adenoma(s), advance adenoma(s), neoplasia and advanced neoplasia, are reported to be higher for those provinces that used the FTi in comparison to those provinces that used the FTg.

The PPV increased with age and was higher in the male population. It varied across provinces.

When interpreting this data, testing quality (volumes/cases) should be considered in addition to the specific test used (FTi or FTg), as these factors may impact results. Direct comparison is not always appropriate.

TABLE 3

### Positive predictive value adenomas by FT, sex and age group, January 1, 2011 to December 31, 2012

		Positive predictive value %	Number of adenomas detected
Fecal test type	FTg (target >=35%)	38.8	436
	FTi (target >=50%)	51.2	2,000
Sex	Male	56.5	1,564
	Female	38.6	872
Age group	50–54 Years	40.0	322
	55–59 Years	44.0	314
	60–64 Years	49.1	585
	65–69 Years	50.1	469
	70–74 Years	56.5	603

FTg=guaiac fecal test; FTi=immunochemical fecal test

Data include SK, MB, NS, PE and NL by Fecal Test Type and Sex. Data include MB, NS, PE and NL by Age Group.

SK data include one health region.

FTg was discontinued in PE by June of 2012 after the transition to FTi. FTi was implemented in early 2012.

NL data are for the final 5 months of the reporting period, in one health region.

PE data are for May 1, 2011 – Dec. 31, 2012. FTg was discontinued in PE by June 2012 after the transition to FTi. FTi was implemented in early 2012.

## Program Adenoma Detection Rate

*This is defined as the proportion (per 1,000) of individuals undergoing an adequate fecal test, within the measurement time frame, in which one or more adenomas were confirmed by pathology at colonoscopy or surgery performed within 180 days of the abnormal FT result.*

As referenced in Appendix D, this is  $(O+P)/A \times 1,000$ .

### Program Adenoma Detection Rate Calculation

- Numerator: Number of individuals with adenoma confirmed by pathology from a follow-up colonoscopy or surgery performed within 180 days of the date of an abnormal FT result obtained within the measurement timeframe.
- Denominator: Number of individuals having had at least one successful FT processed by the laboratory within the same measurement timeframe as numerator divided by 1,000.

TABLE 4

**Program adenoma detection rate per 1,000 people screened, January 1, 2011 to December 31, 2012**

	FTg	FTi
<b>Successful tested population (n)</b>	42,691	96,777
<b>Adenoma detection rate per 1,000 people screened</b>	10.2	20.7

FTg=guaiaic fecal test; FTi=immunochemical fecal test

FTg data include MB and PE; PE FTg data are for May 1, 2011 to July 1, 2012.

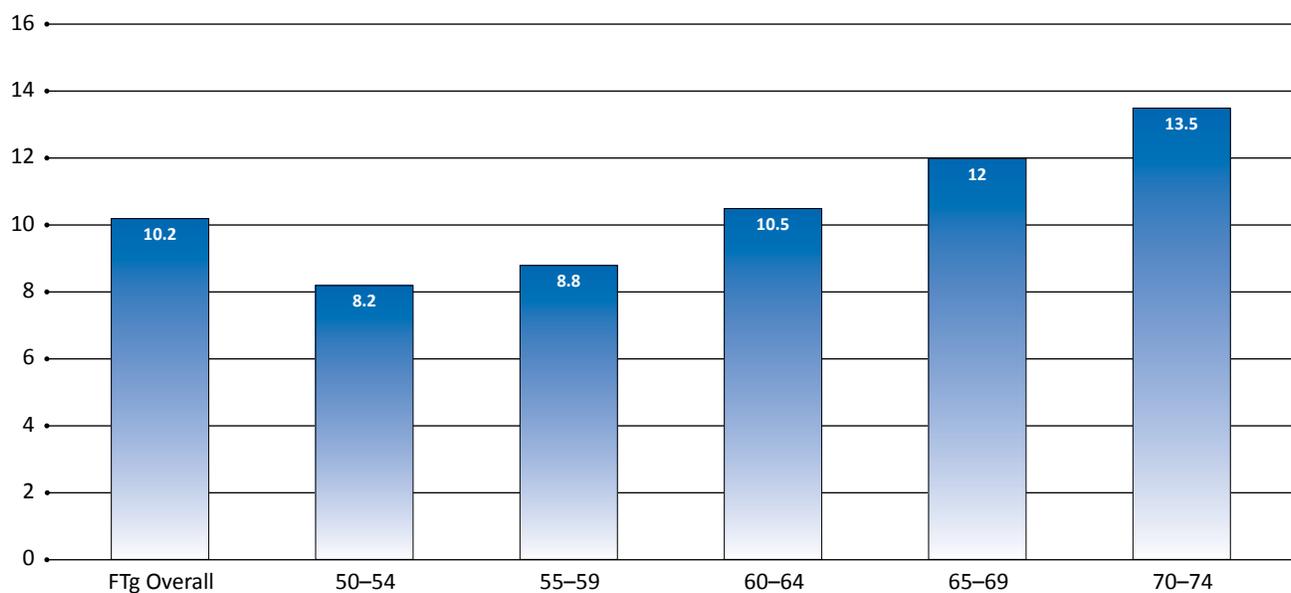
FTi data include SK, NS, PE and NL; SK data include one health region; PE FTi was implemented in early 2012;

NL data are for the final 5 months of the reporting period, in one health region.

FIGURE 16

**Program adenoma detection rate by age using FTg, January 1, 2011 to December 31, 2012**

per 1,000 people screened



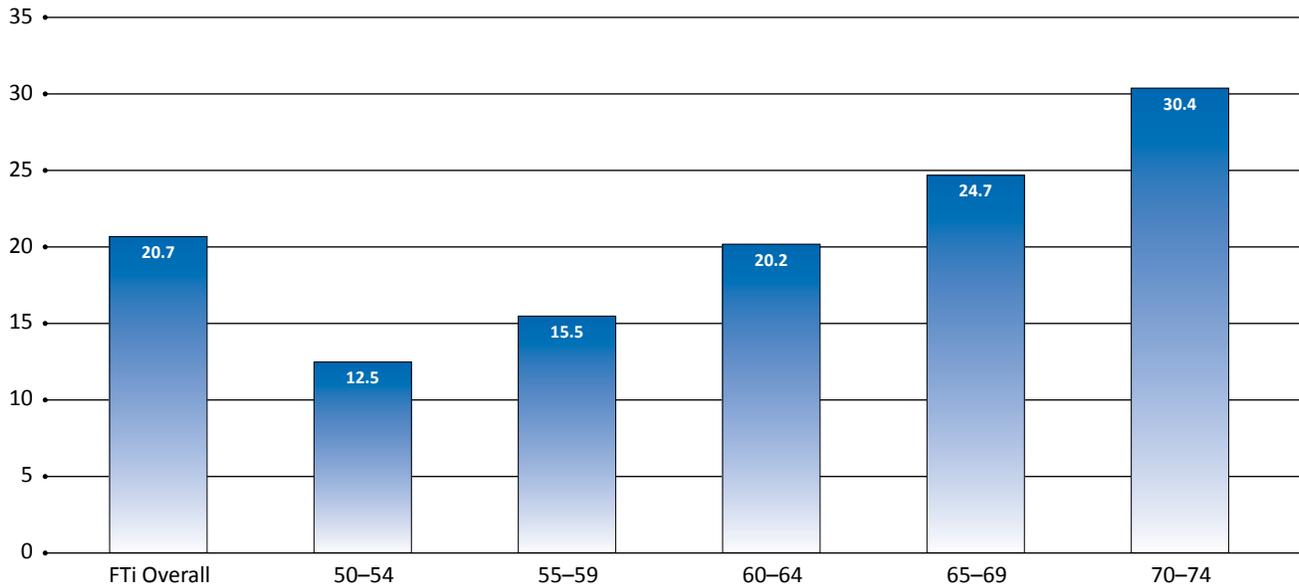
**Includes MB and PEI**

Adenoma detection rates were approximately two times greater in programs using FTi compared with those using FTg. For both tests, there was a progressive increase in adenoma detection rates by age group; the detection rates in those aged 70-74 were 1.5 times (FTg) to 2 times (FTi) higher than rates for those aged 50-54. Adenoma detection rates were 2.5 times higher in males than in females for both tests.

FIGURE 17

**Program adenoma detection rate by age using FTi, January 1, 2011 to December 31, 2012**

per 1,000 people screened



**Includes NL, NS, SK and PEI (2012)**

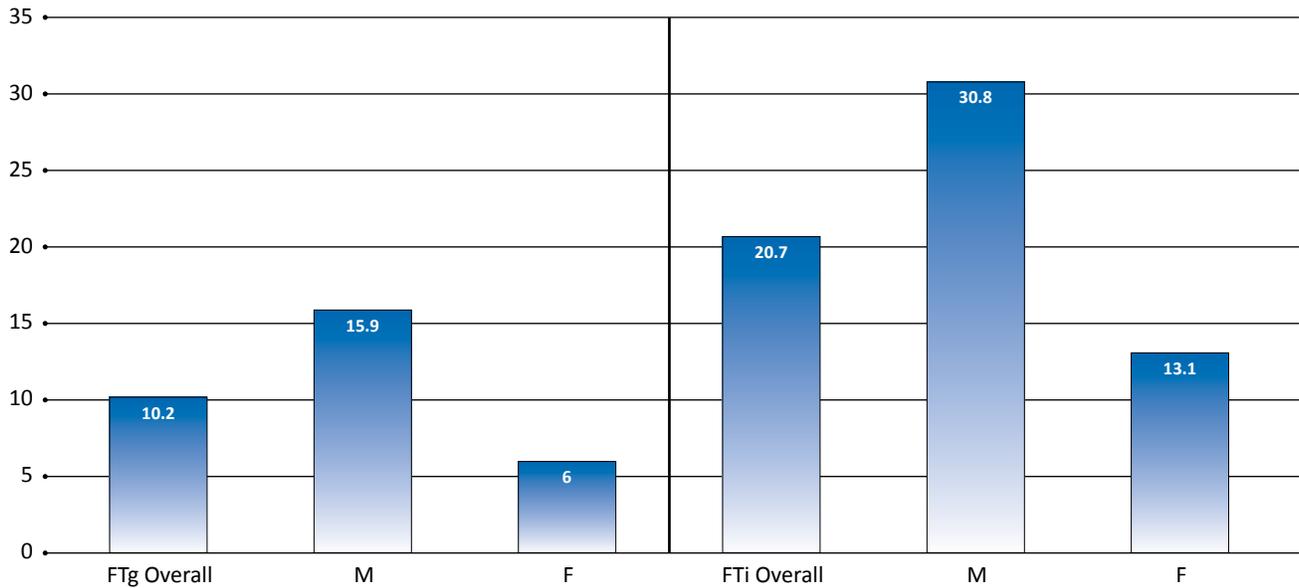
Data were submitted by five provinces who were screening for colorectal cancer during the reporting timeframe. One (Manitoba) used only FTg; three (Newfoundland and Labrador, Nova Scotia and Saskatchewan) used only FTi; and one (Prince Edward Island) used both FTg & FTi.

The majority of the people screened were in Manitoba (92.8% of FTg) and Nova Scotia (89.3% of FTi); the adenoma detection rates are determined primarily by data from these two programs.

FIGURE 18

**Program adenoma detection rate by fecal test type and sex, January 1, 2011 to December 31, 2012**

per 1,000 people screened



FTg Overall includes MB and PE; FTi Overall includes NL, NS, SK and PE (2012 only)

## Program Invasive CRC Detection Rate

*This is defined as the proportion of individuals with CRC confirmed by pathology from a follow-up colonoscopy performed within 180 days of the date of an abnormal screening FT per 1,000 screened within the measurement timeframe.*

The target detection rate for this indicator is  $\geq 2$  colorectal cancers per 1,000 screened.

### Program Invasive CRC Detection Rate Calculation

- Numerator: Number of individuals with CRC confirmed by pathology from a follow-up colonoscopy performed within 180 days of the date of an abnormal FT result obtained within the measurement timeframe.
- Denominator: Number of individuals having had at least one successful FT processed by the laboratory within the same measurement timeframe as the numerator divided by 1,000.

TABLE 5

**Program invasive CRC detection rate by province, January 1, 2011 to December 31, 2012**

	SK (FTi)	MB (FTg)	ON (FTg)	NS* (FTi)	PE (FTg)	PE (FTi)	NL (FTi)	Overall
<b>Colorectal cancer detection rate per 1,000 people screened</b>	0.9	1.4	1.3	–	2.3	3.4	†	1.3

FTg=guaiac fecal test; FTi=immunochemical fecal test

- Data are not available.

\* Qualitative FTi.

† Suppressed owing to small numbers.

SK data include one health region.

ON data are for 2011. Exclusion: individuals with a missing or invalid HIN, date of birth, sex, postal code, or those had a previous invasive colorectal cancer or total colectomy.

FTg was discontinued in PE by June of 2012 after the transition to FTi. FTi was implemented in early 2012.

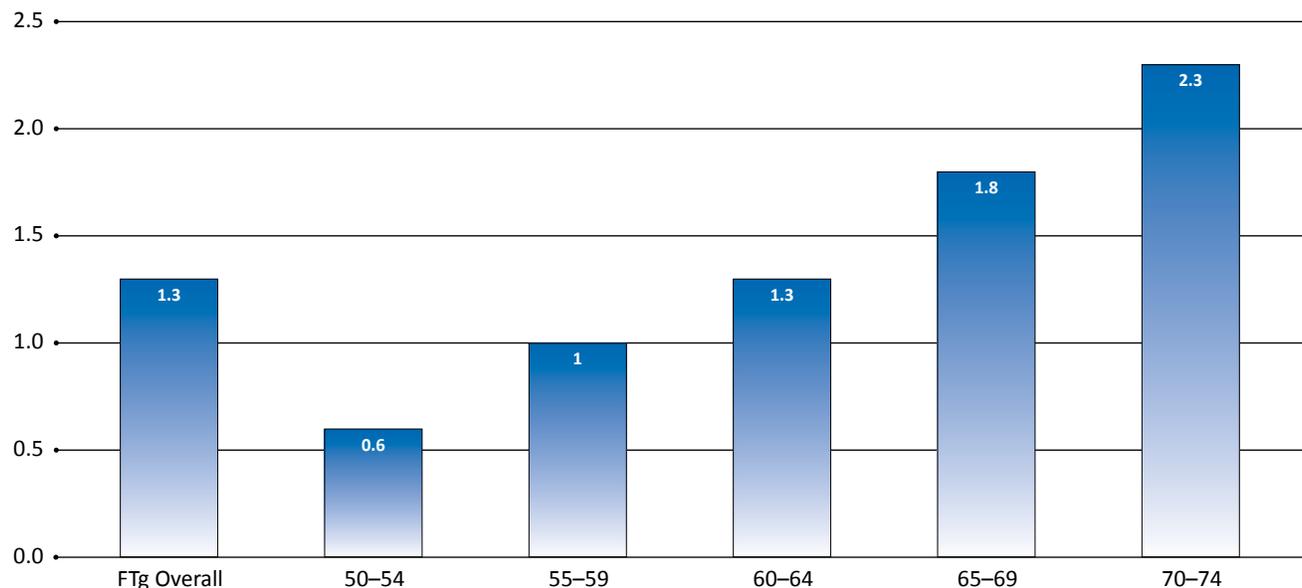
NL data are for the final 5 months of the reporting period, in one health region.

PE data are for May 1, 2011 – Dec. 31, 2012. FTg was discontinued in PE by June 2012 after the transition to FTi. FTi was implemented in early 2012.

FIGURE 19

**Program invasive CRC detection rate by age using FTg, January 1, 2011 to December 31, 2012**

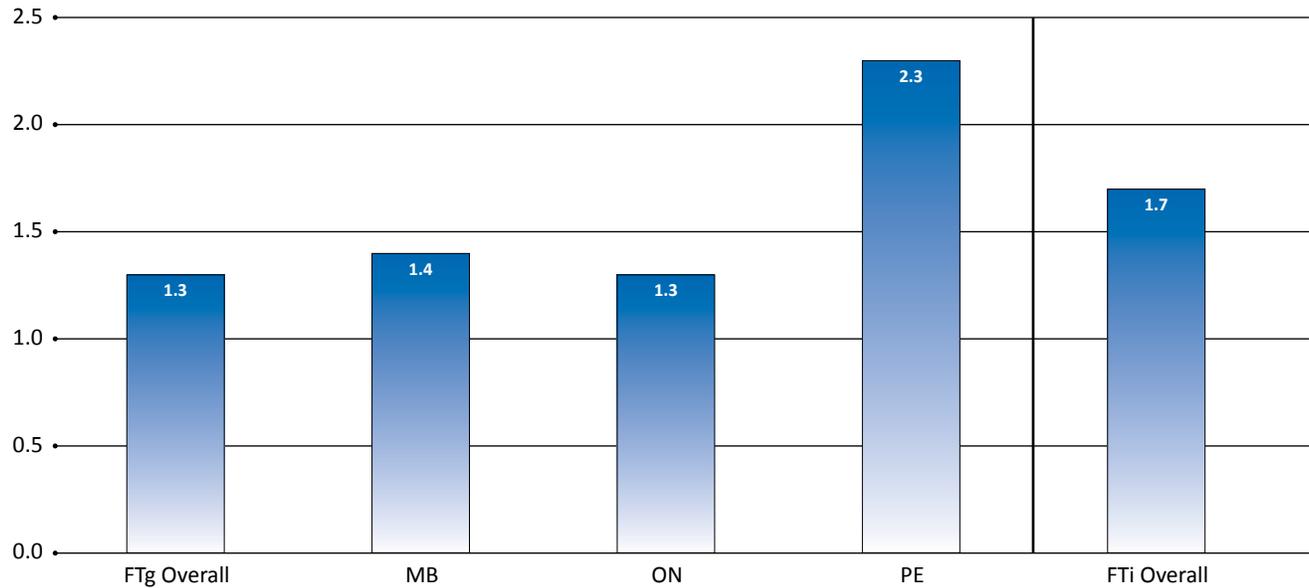
per 1,000 people screened



Includes MB, ON (2011 only) and PEI

FIGURE 20

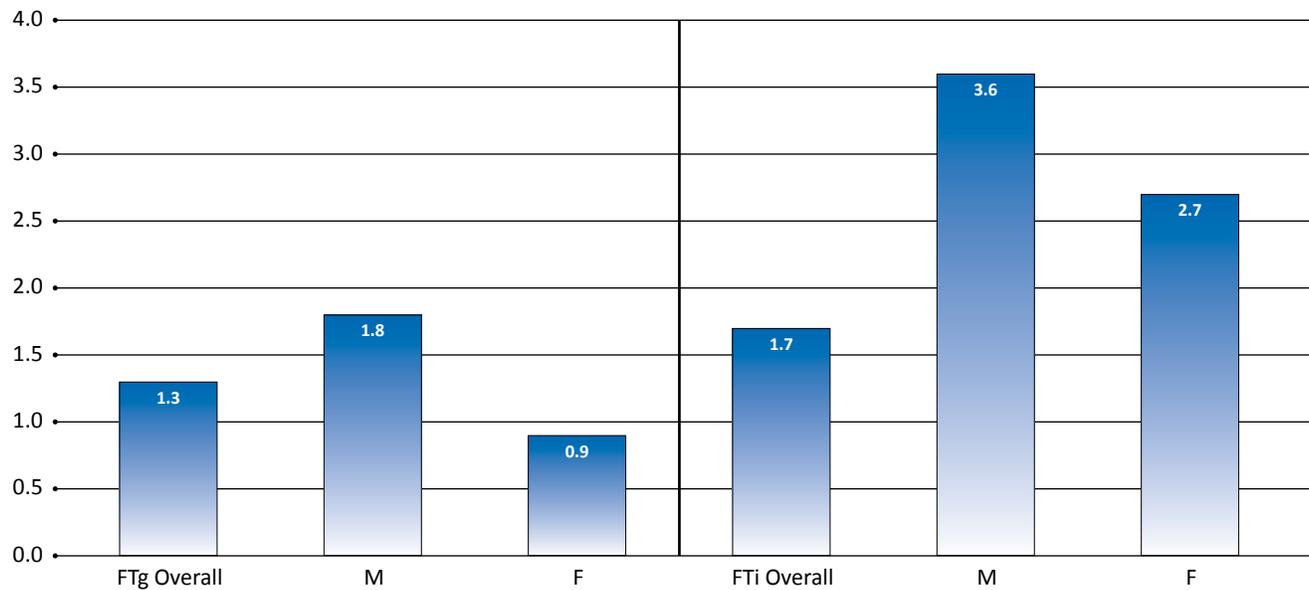
**Program invasive CRC detection rate by fecal test type and province, January 1, 2011 to December 31, 2012 per 1,000 people screened**



FTg Overall includes MB, ON (2011 only) and PE; FTi Overall includes NL, SK and PE (2012 only)

FIGURE 21

**Program invasive CRC detection rate by sex, January 1, 2011 to December 31, 2012 per 1,000 people screened**



FTg Overall includes MB, ON (2011 only) and PE; FTi Overall includes NL, SK and PE (2012 only)

FTi by sex includes only NL and PE data

Overall rates of invasive CRC detection for each of FTg and FTi were 1.3 and 1.7 respectively. Detection rates were twice as high in males as in females with FTg, and 1.3 times as high in males as in females with FTi. There was a consistent trend in Manitoba and Ontario for increasing rates of invasive CRC detection in patients over age groups. Overall, detection rates in 70–74 year-olds were twice those in 60–64 year olds, which were, themselves, twice those in the 50–54 year-olds. Small patient numbers in Prince Edward Island and Newfoundland and Labrador precluded any analysis of age or sex-related trends in invasive CRC detection.

Patient numbers were too small and were therefore not presented for the FTi group. Thus, comparison between the FTi group and the FTg group was not possible.

## Interval CRC

*Interval CRC is defined as the proportion (expressed as percentage) of individuals with normal FT screening results who were subsequently diagnosed with colorectal cancer before their next scheduled screening test.*

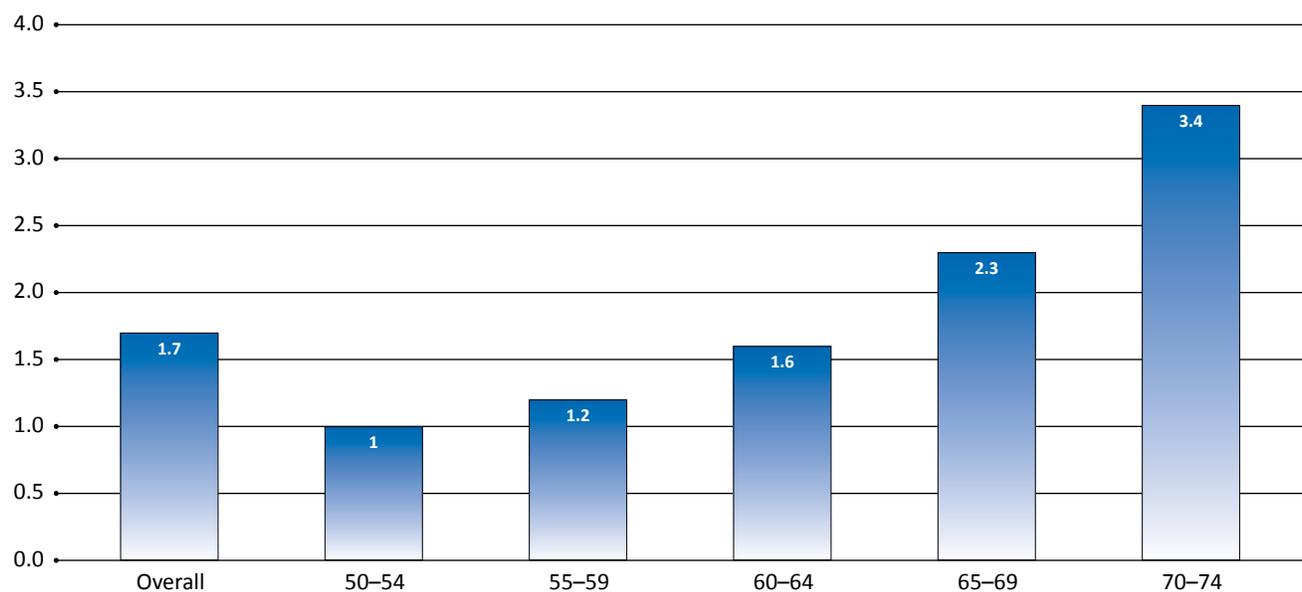
### Interval CRC Calculation

- Numerator: Number of individuals with a CRC diagnosed within the measurement timeframe (January 1, 2011 – December 31, 2012) who also had normal FT screening results  $\leq$  24 months prior.
- Denominator: Number of individuals with normal FT screening results obtained between January 1, 2009 and December 31, 2012.

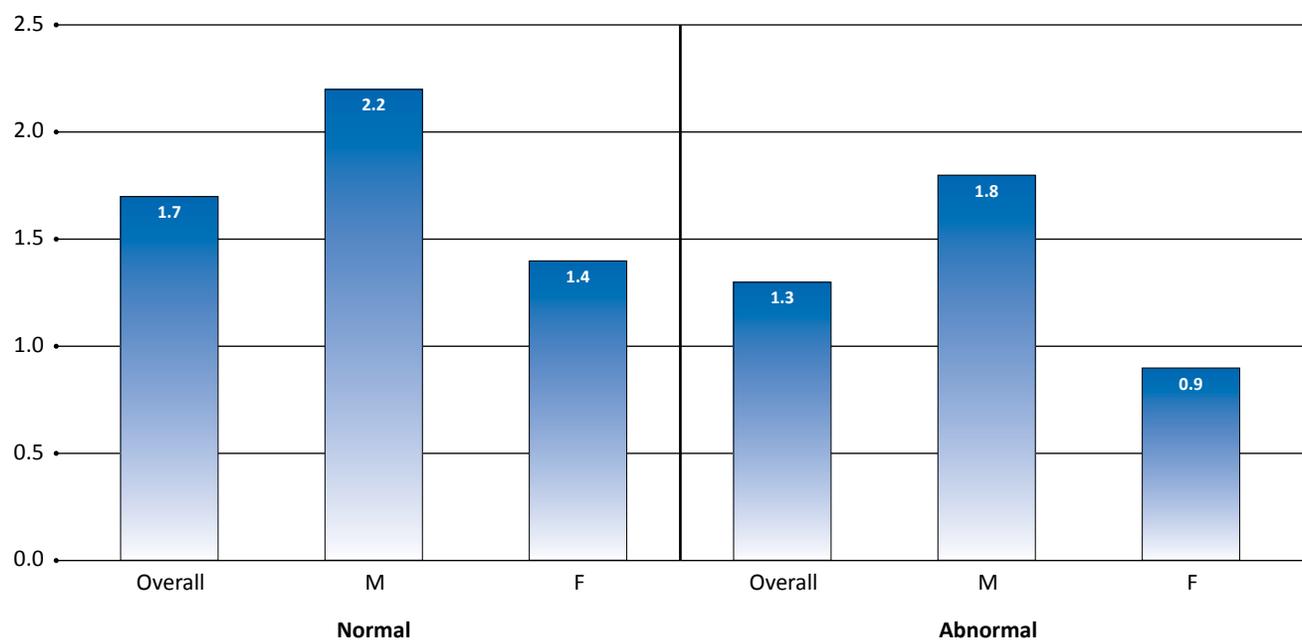
Data are available for only one program (Ontario) for CRC detected over the two-year period after a negative FTg for people who had undergone screening during 2008.

Interval CRC rates in FTg negative patients were comparable to the invasive CRC detection rates for FTg positive patients in Ontario, overall, in males and in females. The interval CRC rates were higher in males than in females and the interval CRC rates increased progressively from age 50–54 years through to age 70–74 years in males and females.

**FIGURE 22**  
**Ontario – interval CRC by age, based on FTg**  
 per 1,000 people with normal FT



**FIGURE 23**  
**Ontario – interval CRC by sex, based on FTg**  
 per 1,000 people with a normal and abnormal FT



## Invasive CRC Stage Distribution

*This is defined as the distribution (percentage) of screen-detected invasive colorectal cancer by TNM stage.*

### Invasive CRC Stage Distribution Calculation:

- Numerator: Number of individuals with invasive CRC stage I, II, III or IV diagnosed by the screening program from a follow-up colonoscopy within 180 days after an abnormal laboratory FT result within the measurement timeframe.
- Denominator: Number of individuals with invasive CRC confirmed by pathology at follow-up colonoscopy within 180 days after an abnormal laboratory FT result within the same measurement timeframe as the numerator.

Programmatic data from Saskatchewan, Manitoba, Prince Edward Island and Newfoundland and Labrador indicate that 70.9% of screening- detected cancers among people aged 50–74 years were found at Stage I or Stage II (during the January 1, 2011 to December 31, 2012 reporting timeframe).

Staging information is not yet available at the national level.<sup>1</sup> However, data on stage distribution of colorectal cancer diagnosed in the general population in 2006–2007 were collected in Alberta, Saskatchewan and Manitoba. These data show that among people aged 50–59 years, 43.1% of cancers were detected Stage I; among those aged 70–74 years, 49.5% of cancers were detected at Stage II.

The incidence of CRCs diagnosed at a later stage (Stages III and IV) should decline as programs achieve higher uptake in participation.

TABLE 6

### **Invasive colorectal cancer stage distribution, January 1, 2011 to December 31, 2012**

Type of fecal test	FTg Overall	FTi Overall	Overall
Stage I	37.0	61.1	43.1
Stage II	25.9	33.3	27.8
Stage III	24.1	5.6	19.4
Stage IV	13.0	0	9.7

FTg overall includes MB, PE. FTi overall includes NL, PE, SK

SK data include one health region.

FTg was discontinued in PE by June of 2012 after the transition to FTi. FTi was implemented in early 2012.

NL data are for the final 5 months of the reporting period, in one health region

## SPECIAL FOCUS TOPIC:

# Wait Times to Colonoscopy

*Several provinces have already developed systems to monitor wait times for colonoscopy following an abnormal fecal test result. At the other end of the spectrum, some provinces and territories are only starting to lay the groundwork for organized colorectal cancer screening.*

As more provinces establish population-based fecal testing programs, more and better data about wait times for follow-up colonoscopy will become available. These data can be used to determine whether greater investments are needed to support these efforts.

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### British Columbia

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#### About Wait Times

British Columbia's Colon Screening Program was launched provincially in November of 2013. As data become available, wait times for colonoscopy will be monitored closely.

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#### Process for Follow-Up

Patients registered in the Colon Screening Program at the time of their fecal immunochemical test (FTi) will be referred to their geographic health authority for pre-colonoscopy assessment. Physicians who do not register their patients at the time of the FTi being ordered may choose to refer patients with abnormal FTi results to the program. At that point, a referral will be sent to the health authority. Once a patient's referral is facilitated through the program, the program monitors progress and tracks outcomes for patients.

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### Improving Wait Times and Tracking Results

Most Health Authorities have implemented new booking processes to better track overall wait times for gastrointestinal (GI) procedures, including for those patients registered in the Colon Screening Program. In addition, the Program tracks registered patients from date of abnormal FTi result to colonoscopy. These results are reported back to the Health Authorities, to the Ministry of Health and to the Colon Screening Program Steering Committee.

Once data are available, Health Authorities will be assessing the overall service needs and will consider where and when additional resources may be required. Some Health Authorities have already increased colonoscopy procedure capacity, and all are monitoring capacity needs.

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### Alberta

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#### About Wait Times

The Alberta Colorectal Cancer Screening Program (ACRCSP) facilitates the coordination of colorectal cancer (CRC) screening-related services and activities within each

of the five geographic Alberta Health Services zones. This approach provides the flexibility required for zone-based services and activities to meet needs in the local context.

The initial phase of the program implementation is to offer screening through health care providers. The Fecal Immunochemical Test (FTi) was implemented in Alberta as the entry level screening test for average risk individuals in November 2013.

### Process for Follow-Up

Currently, of the five zones within the province of Alberta, three (Edmonton, Calgary, and South), have a centralized triage process in place. The remaining two zones (North and Central) accept referrals by individual physicians. This makes waitlist information difficult to track.

The process for follow-up of an abnormal FTi result is referenced in *the ACRCS Standards and Guidelines for Colonoscopy Services* and is outlined below.

- The ordering physician is responsible for following up abnormal FTi results and informing the patient that he or she should have a follow-up colonoscopy. As a safety net, the ACRCS provides FTi result letters to all patients in Alberta. Those who have a positive FTi result are instructed to follow up with their family physicians.
- Referring physicians inform the local CRC screening centre or the local colonoscopist of an abnormal FTi result. Abnormal FTi referrals should be triaged first to ensure the most appropriate patients are seen first. The triage staff confirm the laboratory result and any other identifying information prior to the patient being called for immediate booking of his or her pre-procedure consultation.
- Alberta Colorectal Cancer Screening Program sets program standards and guidelines for timely diagnostic follow up of abnormal FTi results based on the national recommendations and best practice, and closely monitors the program performance.

These processes are currently in place in larger centres (i.e. Edmonton and Calgary zones). The ACRSP is working to facilitate processes in the smaller zones to enhance FTi follow-up activities. This will help ensure colonoscopy services are standardized across the province.

### Improving Wait Times and Tracking Results

The goal of offering FTi screening to a population at average risk for colorectal cancer is to identify those with possible

early stage disease. When an FTi test is abnormal the person is referred for colonoscopy for further follow up.

The ACRCS is working to improve wait times by using the following strategies: implementing processes for colonoscopy prioritization as outlined above and described in the ACRSP Standards and Guidelines for Screening Colonoscopy Services; and contacting average-risk individuals by mail to offer them FTi screening instead of colonoscopy. This will help remove average risk patients from the current colonoscopy wait list.

The ACRCS program has recommended to colonoscopy services that patients with an abnormal FTi result should be re-prioritized as urgent for colonoscopy services. The ACRCS is utilizing a variety of mechanisms to target and engage leadership, clinical services and primary care. For example, infrastructure is being enhanced throughout all zones.

It is anticipated that colonoscopy services will eventually receive information about abnormal FTi results directly from the laboratory. Individuals will thus be more rapidly identified and contacted either directly or through primary care service. At present, results are received by letter through our program to the patient and their Family Physician receives the results from the labs and through Net care.

At present wait time for colonoscopy screening of Alberta's average-risk population is tracked on a facility-by-facility basis. There is no formalized system for tracking delays. The ACRCS is working with zones to adopt a standardized reporting format. The uptake of the FTi within Alberta is being closely monitored by the program and is reported on a zone basis. The ACRCS is also exploring the use of data linkage with sources of secondary data (e.g., National Ambulatory Care Reporting System, and the Discharge Abstract Database) and FTi utilization data to determine the interval between FTi result and colonoscopy. This will help determine wait times for diagnostic follow-up colonoscopy in Alberta.

## Saskatchewan

### About Wait Times

Saskatchewan has chosen a staged approach for implementing colorectal cancer screening. Data for the 2011–2012 time period shows that only one area – the Five Hills health region – completed a two-year cycle of screening.

### Process for Follow-Up

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During the 2011–2012 screening cycle no navigation process was in place to track colonoscopy screening in the province. However, the Saskatchewan Program for Colorectal Screening (SPCRC) did track physician follow-up of clients by asking physicians to submit a form to the Screening Program indicating that they had referred specific patients for colonoscopy testing.

At present SPCRC has expanded to all Saskatchewan health regions. A staged-in approach to add navigation for clients with abnormal results has started. Client navigators are registered nurses with endoscopy experience who assess, prepare and book clients for colonoscopy through pooled referral. (Pooled referrals mean all endoscopic referrals are located in a central booking system.) The client is assigned to the next available endoscopist appointment.

### Improving Wait Times and Tracking Results

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Saskatchewan is working to improve the system for colorectal cancer screening on several fronts:

- Saskatchewan has a central repository for all laboratory results. The Fecal Immunochemical Test (FTi) result is sent to the physician electronically and by paper.
- A letter is sent by the Colorectal Screening Office Clerk directly to clients to inform them of their FTi result
- Designated endoscopists are identified within each health region.
- The nurse navigator assesses the client using standardized guidelines and submits the assessment to the Endoscopy Unit. Endoscopists only see clients prior to endoscopy if there are complex health concerns.

Clients may request a delay in colonoscopy for personal reasons. Currently this is tracked via a manual process as the electronic software does not include a process to track this.

## Manitoba

### About Wait Times

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In Manitoba, 78.6% of ColonCheck participants who had a positive fecal occult blood test between January 2011 and December 2012 underwent a follow-up colonoscopy within 180 days. The percentage was higher for women (80.1%) than men (77.7%) and appeared to decrease with age. The median wait time was 70 days. This reflects the date the participant attended the appointment—rather than the first available appointment—as participants sometimes delay appointments for medical or personal reasons.

### Process for Follow-Up

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ColonCheck has formal agreements with a limited number of endoscopists and facilities to perform follow up colonoscopies for program participants. This helps to ensure that follow-up occurs in a timely manner and that results are reported to the program in a standardized format.

Participants with a positive FTg are telephoned by ColonCheck’s Follow-Up Coordinator to inform them of the test result and recommend they undergo a follow-up colonoscopy. The participant is sent the result by mail, along with information about follow-up testing including appointment details. A letter about the positive FTg result is also sent to the participant’s primary care provider.

If the participant lives in Winnipeg or receives medical care in Winnipeg, the Follow-Up Coordinator books a colonoscopy at one of two facilities. Before the appointment, ColonCheck’s Nurse Practitioner meets with the person to conduct a pre-colonoscopy assessment, provide bowel preparation instructions and answer questions.

If the participant receives medical care outside Winnipeg, the Follow-Up Coordinator sends referral information to a local endoscopist/facility partnering with ColonCheck. The endoscopist or facility then schedules the procedure and pre-colonoscopy assessment.

In about 25% of cases, primary care providers (rather than ColonCheck) refer their patients for colonoscopy.

## Improving Wait Times and Tracking Results

ColonCheck is improving wait times by working with ColonCheck endoscopists and colonoscopy facilities across the province and having designated procedure times for program participants. In Winnipeg, a Nurse Practitioner provides pre-colonoscopy assessments for all patients, further reducing wait times by eliminating the need for a consult with an endoscopist prior to the procedure. ColonCheck also participates in provincial and regional initiatives, such as the Cancer Patient Journey Initiative to reduce wait times.

ColonCheck works closely with participating endoscopists and colonoscopy facilities to track program-referred participants and to obtain colonoscopy reports and follow-up recommendations. Endoscopists working with ColonCheck are required to complete standardized reporting forms. In addition ColonCheck tracks procedural performance and quality indicators for quality assurance and provides feedback to endoscopists. ColonCheck has also implemented standardized recommendations for future screening and colonoscopic surveillance to support patient safety and appropriate use of resources.

ColonCheck also follows up with all primary care providers who refer participants directly to colonoscopy to obtain results.

## Ontario

### About Wait Times

Cancer Care Ontario does not publish wait times, so data from Ontario were not submitted to the 2011–2012 Program Performance Results Report. However, Cancer Care Ontario publishes two related indicators:

- The percentage of Ontarians 50–74 years old who had a follow-up colonoscopy within six months of an abnormal FTg result.
- The percentage of Ontarians 50–74 years old with an abnormal FTg result who had a follow-up colonoscopy within eight weeks of the abnormal test result.

Of the approximately 19,000 50–74 year-old Ontarians who had an abnormal FOBT result requiring follow-up with colonoscopy in 2012, nearly 8,000 (42%) had a colonoscopy within eight weeks and 14,500 (76%) had a colonoscopy within six months of the abnormal result.

## Process for Follow-Up

Referrals to colonoscopy for individuals with an abnormal FTg result are made by the individual's primary care provider (PCP). For those individuals without a PCP who received a test through a non-PCP channel (community pharmacy, mobile coach, or Telehealth Ontario), Cancer Care Ontario contacts those with an abnormal result directly and attaches them to a primary care provider for referral to colonoscopy.

### Improving Wait Times and Tracking Results

Abnormal follow-up and wait times are tracked in a number of ways:

- The two colorectal cancer screening abnormal follow-up indicators (colonoscopy within eight weeks and six months of an abnormal FTg) are reported annually in the Ontario Cancer System Quality Index (CSQI). Data are reported for the province, by region (Local Health Integration Network), and by sociodemographic factors (age, sex, neighbourhood income quintile, and urban/rural).
- Cancer Care Ontario collects wait time data from 61 hospitals that receive incremental funding for colonoscopies performed for ColonCancerCheck program indications (abnormal FTg and family history). Wait time data are reported at the facility level, by region and by province on a monthly basis to these facilities as well as to the 14 Regional Cancer Programs.
- Twice a year, primary care providers in a Patient Enrollment Model practice receive a Screening Activity Report, a tool that allows providers to see the complete screening status of their patients including those with abnormal results requiring follow-up. (In 2014, the Screening Activity Report was expanded to incorporate screening status for cervical and breast cancer in addition to colorectal cancer.)

### Improving Wait Times / Abnormal Follow-Up:

- Facility and regional wait times are monitored, and Cancer Care Ontario has an escalation process that can be implemented if necessary. This process involves working with each region (including the regional lead and regional cancer program staff) to develop a strategy to improve wait times.

- Using a regional version of the Screening Activity Report, Regional Primary Care Leads contact primary care providers with a high number of people who require abnormal follow-up to provide education regarding the reports and recommended abnormal follow-up.
- Cancer Care Ontario is exploring the possibility of conducting a pilot study where nurse navigators will be used to facilitate follow-up of abnormal FTg results.

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## Quebec

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### About Wait Times

There are currently no organized screening colorectal cancer screening programs underway in Quebec. Eight institutions are conducting demonstration projects. As part of this work, a standardized colonoscopy request application has been developed detailing clinical indications for colonoscopy as well as related priorities for access.

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### Process for Follow-Up

The referring physician receives the patient's immunochemical fecal occult blood test (FTi) result following the analysis by the main laboratory. If there is blood in the stool, the physician orders a colonoscopy for diagnostic confirmation; this test must be performed within 60 days following the positive screening result. So the responsibility to follow-up on abnormal fecal screening tests currently falls on the prescribing physician.

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### Improving Wait Times and Tracking Results

A standardized colonoscopy form is available. The main purpose of this form is to sort out the relevance of requests and to propose clinical indications, as well as related priorities for access. The goal is to have 95% of referring physicians eventually use this standardized form. Institutions are responsible for implementing actions to achieve this target – for example, returning non-compliant forms or calling the referring physician.

The availability of the immunochemical fecal occult blood test (FTi) has helped reduce the use of colonoscopy as a first-line screening test for colorectal cancer in asymptomatic persons identified as being at average risk. The result is that colonoscopy is now reserved for symptomatic or high-risk individuals. We expect that this will help reduce colonoscopy wait times.

Efforts are being made towards upgrading gastrointestinal endoscopy units by analyzing organizational and clinical processes. A guide that will help organizations achieve this is in the process of being published. One chapter deals specifically with the standards recommended for ensuring that anyone who requires a colonoscopy can receive one within the wait time required by his/her condition. The chapter also covers strategies for getting an accurate picture of the colonoscopy waiting list and achieving a balance between supply and demand. The guide also provides details on wait time calculation, the roles and responsibilities of those involved in the monitoring of colonoscopy access, and monitoring indicators.

Health and social services institutions and agencies designated as demonstration sites for the PQDCCR (Quebec's colorectal cancer screening program) are responsible for documenting and monitoring wait times. They must forward this information to management at the *ministère de la Santé et des Services sociaux* (the department of health and social services in Quebec). A ministerial "data warehouse" exists for these data, but not all institutional appointment management systems currently allow the transfer of access data to this warehouse. Efforts are underway to ensure that access data from all endoscopy units in the province will be documented.

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## New Brunswick

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### About Wait Times

The New Brunswick Colon Cancer Screening Program was scheduled to be launched in the fall of 2014. Information about the wait times between an abnormal (FTi) result and a colonoscopy is not available for this report.

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### Process for Follow-Up

The New Brunswick Colon Cancer Screening Program's Nurse will contact all participants whose FTi results are abnormal/positive to discuss recommended follow-up. The Nurse will do a pre-colonoscopy assessment over the phone; if the participant is assessed to be able to proceed to colonoscopy, she will coordinate the booking of a colonoscopy.

The Nurse will ask for pre-colonoscopy consult with a program endoscopist if this is required based on the pre-colonoscopy assessment. The Program's goal is to have the colonoscopy booked within 60 days of the abnormal/positive FTi result date and a consult booked with endoscopist within four weeks of the referral. The New Brunswick Cancer Network (NBCN) has negotiated with regional hospital facilities to purchase after-hours time-slots for colonoscopies generated by the Colon Cancer Screening Program.

### Improving Wait Times and Tracking Results

In New Brunswick, the Cancer Screening Integrated Information System (CS-IIS) will track wait times between the positive FTi result report date and the date of the actual colonoscopy for each participant. The Cancer Screening Program Business Unit staff will investigate if any delays are due to capacity or personal reasons. The Program is supported by the Clinical Practice Guidelines distributed to all primary health-care providers, gastroenterologists, general surgeons, pathologists, medical and radiation oncologists and various other stakeholders.

## Nova Scotia

### About Wait Times

In 2012, the median wait time for Nova Scotians with an abnormal FTi result and colonoscopy was 63 days; the 90<sup>th</sup> percentile wait time for this was 111 days. The median wait time between colonoscopy and confirmed pathological finding was seven days; the 90<sup>th</sup> percentile wait time for this was 13 days.

In addition to national reporting through the Canadian Partnership Against Cancer, Nova Scotia's Colon Cancer Prevention Program also monitors the wait times from abnormal FTi notice (result letter mailed to participant to first contact by District Screening Nurse) and wait times to colonoscopy through the program's information system.

The Program's wait time target for people to be contacted by a District Screening Nurse is two weeks after the abnormal FTi result. The wait time target for colonoscopy is eight weeks after the abnormal FTi result. Delays are tracked and coded according to the nature of the delay. The goal is to better understand the role of personal and medical factors (e.g. patient choice or a current health

condition) that may affect delays, versus system factors (e.g., finite capacity) in what happens after an abnormal result on first screening.

The Program frequently uses this information to gain a better understanding of wait times and resource utilization at both the provincial and district health authority levels. Furthermore, this information (regional and provincial wait time data and program targets) is also reported to each health district on a regular basis to support individual institution planning/operations. These data also enable districts to see how their performance compares with outcomes in other parts of the province.

### Process for Follow-Up

Through Nova Scotia's Colon Cancer Prevention Program, all program participants with abnormal FTi results are informed of their results by mail and a copy of the letter is sent to the person's primary care provider. As of October 1, 2014, FTi results began to flow electronically to primary care providers via their primary care Electronic Medical Record (EMR). The letter informs each participant that blood was found in his/her stool sample and that a follow-up test called a colonoscopy is needed to determine the source of the blood. The letter also informs participants that a District Screening Nurse will be contacting them to set up an appointment to discuss their screening result and to explain the colonoscopy procedure. This nurse will also perform an initial "pre-colonoscopy" assessment.

Once the District Screening Nurse has met with the patient and deemed the person medically fit for colonoscopy, the nurse (with the patient's permission) books that patient for the procedure. If the District Screening Nurse is unable to determine the patient's fitness for colonoscopy, the patient is referred to a colonoscopist for consultation.

### Improving Wait Times and Tracking Results

Nova Scotia's Colon Cancer Prevention Program is committed to monitoring and improving wait times. Work is currently underway to expand the provincial wait time information system and to explore options for monitoring all endoscopy wait times. Such data should provide a more "global perspective" of endoscopy wait times in the province.

## Prince Edward Island

### About Wait Times

Prince Edward Island (PEI) experienced a significant uptake in screening program participation from program implementation in May 2011 to December 2012. This is likely due to the fact that the province moved to Fecal Immunochemical Testing (FTi). This was accompanied by mass invitation-to-screening mail-outs and promotional campaigns.

Along with this increase in participation, PEI experienced a significantly higher rate of abnormal test results which placed an unanticipated strain on endoscopic services. That said, it is reassuring to see that the wait times for colonoscopy first reported for PEI in 2011–2012 did not change dramatically over the following year considering the increase in demand (see the Canadian Partnership Against Cancer's 2009–2011 *Colorectal Cancer Screening Program Performance Results Report*). The managers of the endoscopic units are closely linked to the planning and monitoring of the program which allows for response to fluctuations when possible. As well, two additional general surgeons were hired in late 2012 to fill the complement for PEI, and in early 2013 a gastroenterologist opened a new practice providing more availability of endoscopic services.

PEI continues to monitor participation in screening, rates of abnormal FTi testing and patient wait times for colonoscopy. These statistics are regularly reported to program administrators in an effort to mitigate wait times and improve access to timely screening for PEI residents.

In 2012, the screening program implemented a standardized colonoscopy referral form to be used by healthcare providers. The goal is to improve the quantity and quality of information that accompanies referrals for colonoscopy. This will help endoscopic physicians to better triage patients taking into account the level of urgency for each requested procedure. In 2014, a revised referral form was developed to align with the provincial Colorectal Cancer Screening Clinical Practice Guidelines and provide more guidance on what information is needed to best plan patient care.

### Process for Follow-Up

In PEI the responsibility for following up an abnormal FTi result belongs to the person's primary care provider (GP or NP), whether the FTi was programmatic or not. However, if a person is without a primary care provider and

participates in the program, then the program is responsible for linking the patient to a primary care provider in his/her primary care network to follow-up on the abnormal test.

The current process for monitoring screening program participants with an abnormal FTi that requires a follow-up colonoscopy is managed by the PEI Colorectal Cancer Screening Coordinator. Participants are tracked using reports from the province's Clinical Information System (CIS). The current practice of the coordinator is to follow-up with the primary care provider if the patient does not have a colonoscopy scheduled or completed after three months from the time the abnormal FTi result.

The PEI Colorectal Cancer Screening Program does not make referrals for colonoscopy nor does it book colonoscopies. This referral is done by the person's primary care provider.

### Improving Wait Times and Tracking Results

Preliminary data reviewed for 2013 shows decreased wait times for screening participants requiring follow-up colonoscopy. A number of investments took place in that year to improve access and shorten wait times. This included the addition of two general surgeons and one gastroenterologist which increased the complement of endoscopic physicians to 10 in PEI.

As well, the provincial screening program funded a temporary "overtime" initiative in early 2013: this enabled more than 100 colonoscopies to be done on screening program patients with positive FTi results by scheduling the procedures during weekends and holidays.

The strain on endoscopic services in PEI has also demonstrated possible inconsistencies in the screening pathway for patients. In early 2014 a working group representing primary care, endoscopy and pathology was formed by Health PEI to develop provincial clinical practice guidelines and make recommendations for improvements in the screening pathway. The PEI Colorectal Cancer Screening Clinical Practice Guidelines were formally approved in the spring of 2014. This information will be used to better support clinical decisions, guide consistent surveillance after an index colonoscopy and improve uptake of colonoscopy following an abnormal FTi result.

## Newfoundland and Labrador

### About Wait Times

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The Newfoundland and Labrador Colon Cancer Screening Program began in late July 2012. A total of 76 colonoscopies were completed within the reporting time frame. All these screening colonoscopies were completed within 180 days of an abnormal Fecal Immunochemical Test (FTi). The median wait time was 105 days (the 90<sup>th</sup> percentile was 159 days). The relatively low volume of procedures refers to the actual number of colonoscopies completed for the colon cancer screening program ending December 31, 2012. As the number of abnormal FTi colonoscopies increases, it is reasonable to assume that a more accurate picture of wait time for abnormal FTi colonoscopy will emerge.

### Process for Follow-Up

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A process is in place within the Newfoundland and Labrador Colon Cancer Screening Program aimed at helping participants with abnormal FTi tests navigate the health system and undergo a timely colonoscopy procedure. Program nurses work with the client, endoscopy booking clerks and the Medical Director of the Newfoundland and Labrador Colon Cancer Screening Program to complete this process. (At the time this report was written, the program did not yet have dedicated endoscopy time.) Program nurses also educate clients on the colonoscopy procedure and the importance of proper bowel preparation.

The province has a Provincial Wait Time Advisory Committee for Endoscopy that continues to work towards enhancing endoscopy services in the province. The Newfoundland and Labrador Colon Cancer Screening Program is working with the committee as the screening program is phased-in throughout the province.

An information management system exists within the Program that records data on each client including colonoscopy appointment dates. This data can be de-identified and wait times within the screening program can then be reported annually to the program endoscopists.

## Nunavut

Organized screening for colorectal cancer in Nunavut is not yet up and running so we have no wait time data. Our current model was designed to consider the unique health care access situation in the North and the system of community health centres that exists in Nunavut.

All FTs are done at our territory lab, with abnormal results forwarded from the lab directly to the Colorectal Screening Team which is affiliated with Nunavut's Surgical Services. We then notify the patient's practitioner – a family physician (FB) or NP (in Iqaluit) or a health centre nurse in the person's local community. A request is made for a Part Two Colorectal Assessment form which contains details about the person's overall health and current medications; this form is supposed to be completed within a week and then forwarded to Surgical Services. Once the Part Two form has been received by the screening team in Iqaluit, a colonoscopy booking is made and the person's home community health centre nurse is notified. Tracking and follow-up are done by the screening team.

## Northwest Territories

The Northwest Territories (NWT) does not have an organized colorectal cancer screening program. As such, it does not have a systematic means for tracking wait times for follow up colonoscopies after an abnormal FTi. The three sites in NWT where colonoscopies are performed typically track the process manually.

The goal is to see these clients within 60 days of an abnormal FTi result. Since this is classified as a semi-urgent referral (i.e. considered less urgent than referrals for people with potentially troubling colorectal signs/symptoms), the wait list tends to be fairly short. More routine follow-ups tend to involve the longest wait times.

Depending on capacity, there is plan to conduct a four-year review of the colonoscopy referral process for an abnormal FTi result. This will allow linkage of findings to pathology reports.

## Yukon

In the absence of a formal colorectal cancer screening program, Yukon does not currently have the means to track wait times. Anecdotally, wait times for abnormal screen results are one month or less, but this has not been verified either by audit or automated tracking.

All follow-up colonoscopies are carried out by the surgical service at Whitehorse General Hospital.

# Conclusion

*This report describes programmatic colorectal cancer screening data for six provinces that were able to provide data for the period of January 2011 to December 2012. The report continues to reveal significant variations in terms of screening uptake as well as achieved targets for quality indicators.*

Participation is a key indicator of program success. Current participation rates have not yet reached the national target of 60%; however, as programmatic colorectal cancer screening has begun only recently in Canada, participation is expected to increase as programs become established.

It is also important to note that many Canadians report screening with fecal tests, flexible sigmoidoscopy, or colonoscopy outside of screening programs.<sup>11</sup> Continuous monitoring of participation and identification of successful recruitment strategies are essential to increase colorectal cancer screening participation. While men have higher rates of colorectal cancer incidence and fecal test positivity, they are less likely to participate in screening. Thus, the development of strategies which increase screening participation in men and other under-screened groups must continue.

The rate of fecal test inadequacy meets the target of  $\leq 5\%$  in all provinces, indicating a high level of effectiveness for test performance by the target population. Encouragingly, no deaths occurred within 30 days of follow-up colonoscopy in any of the reporting provinces from 2009 to 2012.

The proportion of screen-detected invasive colorectal cancers diagnosed at an early stage increased from 64.4% in 2009–2010, to 70.9% in 2011–2012. It is expected that

the stage distribution will continue to shift towards early-stage detected cancers as screening uptake and retention increase.

Results demonstrate that only 75% of individuals with an abnormal fecal test result obtained a follow-up colonoscopy within 180 days – this is 10% below the national target of  $\geq 85\%$ . The wait time from abnormal fecal test to colonoscopy similarly falls short of the target ( $\geq 90\%$  within 60 days) across the country.

As highlighted in our special topic section, all provinces and territories are taking active steps to improve wait times to colonoscopy and to implement strategies that will ensure appropriate and timely follow-up of all individuals with an abnormal fecal test result.

It has been demonstrated that screening delivered through organized programs has a greater potential ability to reduce cancer incidence and mortality, is more cost-effective, and is more likely to reduce potential harms from screening compared with non-programmatic screening.<sup>16</sup> As more provinces and territories develop and implement population-based screening programs, our ongoing evaluations and reporting of these programs will provide opportunities for an iterative process of quality improvement among the various jurisdictions.

TABLE 7

## Summary of performance indicators results, by province, January 1, 2011 to December 31, 2012

	SK	MB	ON	NS**	PE	PE	NL*	Overall
Type of fecal test	FTi	FTg	FTg	FTi	FTg	FTi	FTi	
Successfully tested population (n)	6,487	39,626	488,801	86,423	3,065	3,244	623	628,269
Positive results (n)	444	1,358	20,740	4,055	84	443	86	27,210
Positive results (%)	6.8	3.4	4.2	4.7	2.7	13.7	13.8	4.3 FTi 5.2 FTg 4.2
Follow-up colonoscopy within 180 days (n)	312	1,068	15,472	3,249	322		76	20,499
Follow-up colonoscopy uptake within 180 days (%)	70.3	78.6	74.6	80.1	61.1		88.4	75.3
Wait time for colonoscopy, days (90 <sup>th</sup> percentile)	149	140	–	113	155		159	–
PPV adenoma (%)	45.8	39.8	–	53.2	20.0	33.7	51.3	48.5 FTi 51.2 FTg 38.8
Adenoma detected per 1,000 screened	22.0	10.7	–	20.0	3.6	27.7	62.6	17.5
PPV CRC (%)	1.9	5.1	4.3	–	12.7	4.1	†	4.3
CRC detected per 1,000 screened	0.9	1.4	1.3	–	2.3	3.4	†	1.3
30-Month retention rate***	70.7	54.3	63.3	68.5	–	–	–	63.2

FTg=guaiac fecal test; FTi=immunochemical fecal test

– Data are not available.

\* Quantitative FTi

\*\* Qualitative FTi

† Suppressed owing to small numbers.

\*\*\*Initial fecal test data are for Jan. 1, 2009 – Dec. 31, 2010. ON initial fecal test data are for 2009 and excluded individuals with a missing or invalid HIN, date of birth, sex, postal code, individuals with a previous colorectal cancer or a previous colectomy, individuals who had colonoscopy and flexible sigmoidoscopy during the follow-up period. MB data for polyp detection rate count only people with polyps that had pathology.

SK data include one health region.

ON data are for Jan 2011 – Dec 2011. Exclusion: individuals with a missing or invalid HIN, date of birth, sex, postal code, or those had a previous invasive colorectal cancer or total colectomy.

FTg was discontinued in PE by June of 2012 after the transition to FTi. FTi was implemented in early 2012.

NL data are for the final 5 months of the reporting period, in one health region.

# Appendix A

## Colorectal Cancer Screening Monitoring & Evaluation Working Group Members

<b>Winson Cheung</b>	Chair, CRC Screening Monitoring & Evaluation Working Group
<b>MaryAnne Zupancic, Danielle Swerhone</b>	Alberta
<b>Laura Gentile</b>	British Columbia
<b>Kelly Bunzeluk</b>	Manitoba
<b>Grlica Bolesnikov, Linda Varner</b>	New Brunswick
<b>Scott Antle</b>	Newfoundland and Labrador
<b>Kami Kandola</b>	Northwest Territories
<b>Erika Nicholson, Amy Folkes</b>	Nova Scotia
<b>Katherine Canil</b>	Nunavut
<b>Anna Kone</b>	Ontario
<b>Marla Delaney, Bethany Murphy</b>	Prince Edward Island
<b>Katleen Busque</b>	Quebec
<b>Yvonne Taylor, Annamae Perry</b>	Saskatchewan
<b>Brendan Hanley</b>	Yukon
<b>David Armstrong</b>	Chair, National Colorectal Cancer Screening Network
<b>Gregory Doyle</b>	Chair, Canadian Breast Cancer Screening Network
<b>Diane Major</b>	Chair, Joint Cancer Screening Initiative
<b>Susan Fekete</b>	Director, Screening & Early Detection, Canadian Partnership Against Cancer
<b>Verna Mai</b>	Expert Lead, Screening & Early Detection, Canadian Partnership Against Cancer
<b>Meghan Walker</b>	Analyst, Canadian Partnership Against Cancer
<b>Carol Irwin</b>	Co-ordinator, Screening & Early Detection, Canadian Partnership Against Cancer

# Appendix B

## Colorectal Cancer Screening Quality Indicators

(The timeframe for all indicators, unless other specified, is January 1, 2011 – December 31, 2012)

Indicator	Description
<b>1. Participation Rate</b>	Participation Rate is defined as the percentage of the target population who successfully completed at least one fecal occult blood test FT (guaiac – FTg or immunochemical – FTi) in the program within the measurement timeframe (January 2011 – December 2012).
<b>2. Retention Rate</b>	Retention rate is defined as the proportion (expressed as percentage) of individuals who had a normal screening test who were rescreened within the measurement timeframe.
<b>3. Fecal Test Utilization</b>	Fecal test utilization is defined as the percentage of the target population that has successfully completed at least one FT, either programmatic or non-programmatic. This information may be available from a variety of sources, including screening programs, fee-for-service data and self-reported data.
<b>4. Fecal Test Inadequacy Rate</b>	Fecal Test Inadequacy is defined as the proportion (expressed as percentage) of individuals whose FT was inadequate and who have not repeated the test to get a successful FT result.
<b>5. Positivity Rate</b>	Positivity rate is defined as the percentage of individuals with an abnormal FT result.
<b>6. Follow-up Colonoscopy Uptake</b>	Follow-up Colonoscopy Uptake is defined as the percentage of individuals with an abnormal FT result that had a follow-up colonoscopy within 180 days.
<b>7. Wait Times to Follow-up Colonoscopy</b>	Wait times to follow-up colonoscopy is defined as the time from an abnormal FT result to follow-up colonoscopy.
<b>8. 14 Day Unplanned Hospitalization Following Follow-up Colonoscopy</b>	14 Day Unplanned Hospitalization Following Follow-up Colonoscopy is defined as the percent of unplanned hospitalizations within 14 days after a follow-up colonoscopy.
<b>9. 30 Day Mortality Following Follow-up Colonoscopy</b>	30 Day Mortality Following Follow-up Colonoscopy is defined as a percent mortality within 30 days of a follow-up colonoscopy.
<b>10. Wait Times from Follow-up Colonoscopy to Definitive Pathological Diagnosis</b>	Wait times from follow-up colonoscopy to definitive pathological diagnosis is defined as the time from a follow-up colonoscopy procedure to definitive pathological diagnosis.
<b>11. Positive Predictive Value (PPV) Adenoma(s)</b>	<p>Programmatic PPV of the FT for Adenoma is defined as the proportion (%) of individuals with an abnormal fecal test, within the measurement timeframe, in whom one or more adenomas were confirmed by pathology at colonoscopy or surgery performed within 180 days of the FT.</p> <p>PPV of FT for Adenoma among those who completed follow-up is defined as the proportion (%) of individuals with an abnormal fecal test within the measurement timeframe, who underwent colonoscopy or surgery within 180 days, in whom one or more adenomas are confirmed by pathology.</p>

Indicator	Description
<b>12. Program Adenoma Detection Rate</b>	Program Adenoma Detection Rate is defined as the proportion (per 1,000) of individuals undergoing an adequate fecal test, within the measurement time frame, in which one or more adenomas were confirmed by pathology at colonoscopy or surgery performed within 180 days of the abnormal FT result.
<b>13. Program Invasive CRC Detection Rate</b>	Program Invasive CRC Detection Rate is defined as the number of individuals with CRC confirmed by pathology from a follow-up colonoscopy performed within 180 days of the date of an abnormal screening FT per 1,000 screened within the measurement timeframe.
<b>14. Interval CRC</b>	Interval CRC is defined as the proportion (expressed as percentage) of individuals with normal FT screening results who were subsequently diagnosed with colorectal cancer before their next scheduled screening test.
<b>15. Invasive CRC Stage Distribution</b>	Invasive CRC Stage Distribution is defined as the distribution (percentage) of screen-detected invasive colorectal cancer by TNM stage.

# Appendix C

## List of Figures and Tables

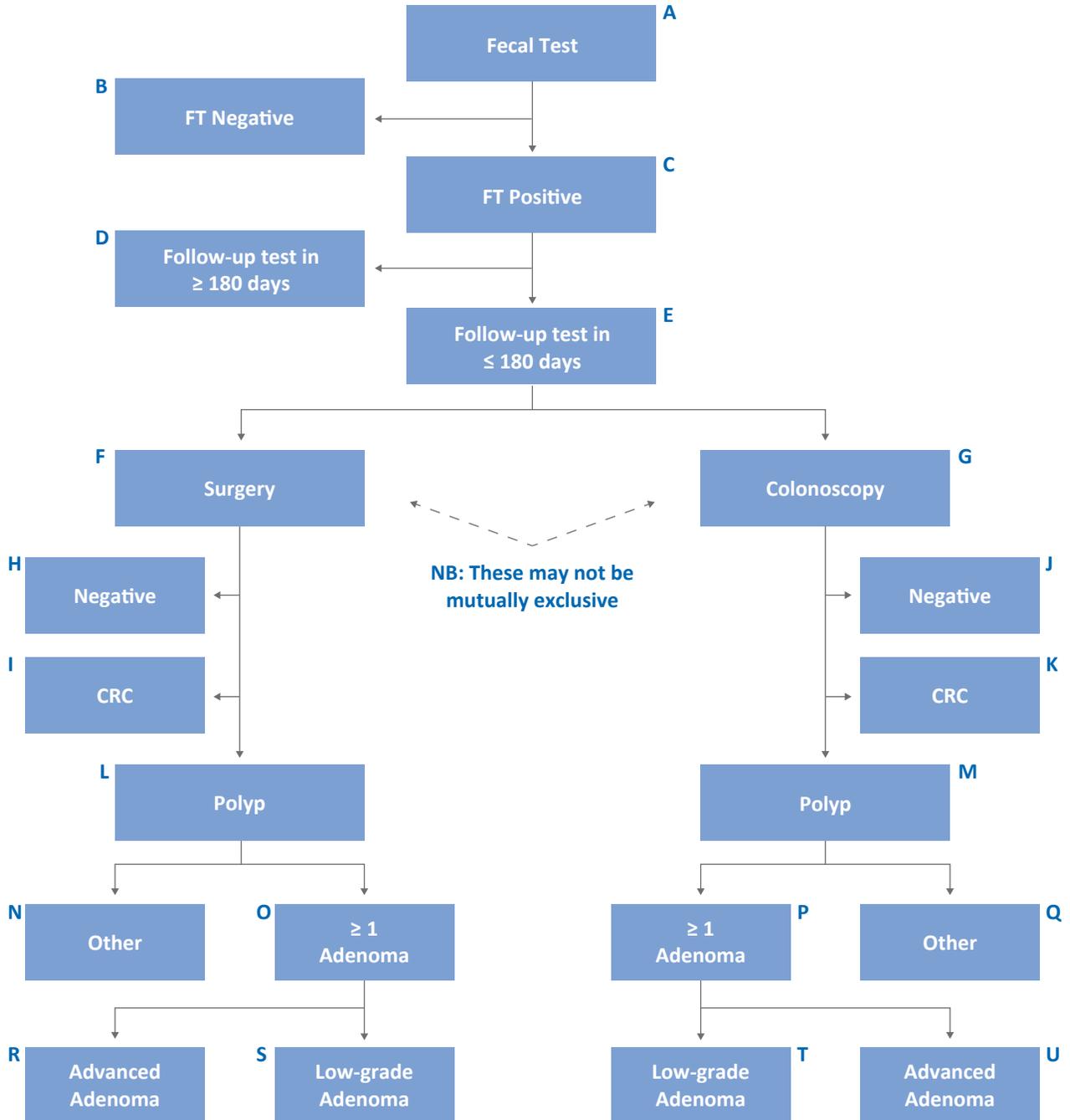
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# Appendix D

## Polyp Detection Indicators — Colorectal Cancer Screening



# Appendix E

## Glossary

### ***Variables Related to FT Screening***

The following process variables are described in the context of CRC screening in which FT is used as the primary screening test.

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#### **Screened/tested (screened or tested participants)**

People who have used and returned an FT, irrespective of the test result, including people with inadequate or incomplete results. Each person is counted once, regardless of the number of tests performed.

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#### **Inadequate test**

An FT returned by a participant in which the results cannot be reliably determined. The quality is insufficient for processing and the test cannot be used for recording a result according to the program policy.

### **Abnormal test (also referred to as a positive test)**

An abnormal FT result based on the last adequate test that, according to the program policy, leads directly to a follow-up colonoscopy referral.

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#### **Normal test (also referred to as a negative test)**

A normal FT result based on the last adequate test according to the program policy.

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#### **Follow-up colonoscopy**

Participants with an abnormal FT require a follow-up colonoscopy. Ideally all participants with abnormal FTs are referred for follow-up colonoscopy.

### ***Variables Related to Endoscopic Screening***

The following process variables are described in the context of CRC screening in which either flexible sigmoidoscopy (FS) or colonoscopy is used as the primary screening test.

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#### **Screened**

Screened participants who have attended the FS or colonoscopy screening examination, irrespective of the result, including people with inadequate or incomplete results. Each person is counted once regardless of the number of exams performed.

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#### **Inadequate test**

Participants who attended FS or colonoscopy screening for whom the test results could not be interpreted within the reporting period. A new screening examination should be performed.

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**Abnormal test (also referred to as a positive test)**

An abnormal screening FS or colonoscopy resulting either in diagnosis of cancer, removal of an adenoma or other lesion or referral for further investigation, according to the program policy.

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**Normal test (also referred to as a negative test)**

An FS or colonoscopy screening test that reports no abnormalities based on the last adequate test according to the program policy.

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**Follow-up Colonoscopy**

Participants with an abnormal screening FS or colonoscopy require a follow-up colonoscopy.

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**Referral to surgery or tertiary endoscopy**

Participants who require surgery or tertiary endoscopy for removal of challenging lesions following a positive FS or colonoscopy.

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**Severe complications requiring hospitalization**

Severe complications requiring hospitalization within 14 days of FS or colonoscopy due to serious hemorrhaging involving transfusion, or due to perforation, vagal syndrome or peritonitis-like syndrome.

**30 day mortality**

Deaths that may occur within 30 days after an FS or colonoscopy, whether diagnostic or therapeutic. If the death is attributed to complications caused by the endoscopy, the participant should be counted in this group.

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**Lesion**

Any lesion removed or biopsied at endoscopy or surgery (whether or not it is diagnosed as adenoma).

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**Adenomas**

Pathological specimens removed at endoscopy or surgery that have been reported by a pathologist to be adenomatous.

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**Cancers**

Colorectal cancer diagnosed by the screening program, or diagnosed as a direct result of participating in the screening program.

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