



Cancer Screening in Canada

**AN OVERVIEW OF SCREENING PARTICIPATION
FOR BREAST, CERVICAL AND COLORECTAL CANCER**

JANUARY 2015

Acknowledgments

The Joint Cancer Screening Committee (*see Appendix A*) would like to gratefully acknowledge the Monitoring and Evaluation Working Groups of the three National Screening Networks, and the Canadian Partnership Against Cancer's Analytics Team for their contribution to the report. Provincial/Territorial cancer screening data was gathered and report drafts were reviewed by the cancer screening programs. Without the ongoing support from the National Screening Networks and the Canadian Partnership Against Cancer, this report would have not been possible.

Suggested citation: Canadian Partnership Against Cancer. Cancer Screening in Canada: An Overview of Screening Participation for Breast, Cervical and Colorectal Cancer. Toronto: Canadian Partnership Against Cancer; January 2015.

Table of Contents

Background	3	Appendix A:	
Why Screen?	4	Joint Cancer Screening	
The History of Cancer Screening		Committee Membership	27
Programs Across Canada	4		
National Screening Guidelines	4	Appendix B:	
National Indicators and Targets for		Provincial/Territorial Population-Based	
Programmatic Participation	6	Screening Program Start Dates/Program	
		Announcements by Cancer Type	28
Methods	7		
Data Sources and Collection	7	Appendix C:	
Indicators and Analytical Details	8	Canadian Task Force of Preventive	
		Health Care Guidelines for Cancer Screening	29
Results	9		
Breast Cancer Screening		Appendix D:	
Participation Across Canada	9	Project Indicators and Definitions	
Cervical Cancer Screening		for Participation by Cancer Type	30
Participation Across Canada	12		
Colorectal Cancer Screening			
Participation Across Canada	15		
Participation in Multi-Site Screening	20		
Discussion	22		
Conclusion	24		
References	25		

Cancer Screening in Canada

An Overview of Screening Participation for Breast, Cervical and Colorectal Cancer

In March 2013, a meeting was convened that included the Chairs of the Canadian Partnership Against Cancer's (the Partnership's) Screening Networks and Monitoring and Evaluation working groups.

In order to better align processes and indicators to compare the different types of cancer screening programs across Canada, a Joint Cancer Screening Committee was established. The purpose of the Committee is to improve the quality of cancer screening outcomes by taking an integrated approach to national efforts, where appropriate.

As an initial project, the committee decided to produce a pan-Canadian report that compares programmatic participation and self-reported utilization (both programmatic and non-programmatic screening) for breast, cervical and colorectal cancer for within and outside of current national screening guidelines. This approach supports the Partnership's goal of increasing screening within guidelines while decreasing screening outside of guidelines. Programmatic participation and self-reported utilization rates were analyzed by the age groups and screening intervals recommended by the Canadian Task Force on Preventive Health Care (CTFPHC) (1-3). Age groups and intervals that are outside of the guidelines were also analyzed.

Background

In 2014, it was estimated that 191,300 Canadians would be diagnosed with cancer and 76,600 Canadians would die from the disease⁴. The primary risk factors for cancer include genetic and environmental factors, smoking, age, physical inactivity, and poor diet⁵. Early detection through programmatic screening combined with effective treatment is intended to prevent disease and/or reduce deaths amongst those who may be at risk for developing the disease⁶.

The Partnership's Screening & Early Detection Portfolio seeks to understand general screening practices across the country and the reasons why some Canadians do not participate in recommended screening programs. By 2017, the goal of the Partnership is to facilitate improved participation in population-based screening for breast, cervical and colorectal cancer and to better understand barriers to screening amongst those who do not participate.

The potential benefits and possible harms of screening healthy adults for cancer are outlined in evidence-based guidelines that are available to health care providers that make recommendations for cancer screening. In Canada, these cancer screening guidelines are issued by national groups such as the Canadian Task Force on Preventive Health Care (CTFPHC), as well as other national organizations (e.g. Canadian Cancer Society, Canadian Association of Radiologists). Provincial/Territorial guidelines also exist and are issued by provincial programs, organizations or governments. In addition to the guidelines, Canadians have access to cancer screening information via the media which regularly report advice about who should be screened, how often and why.

Why Screen?

The main goal of screening asymptomatic people for certain cancers is to detect tumours or other abnormalities at an early stage or before the cancer develops⁷. Such early detection means people can receive effective and timely treatment, reducing both morbidity and mortality associated with cancer⁷.

The population's overall benefit from screening can be elevated by increasing screening participation rates within national guidelines. In Canada, cancer screening is delivered via organized programs (called *programmatic screening*), as well as outside these programs (called *opportunistic or non-programmatic screening*) [e.g. self-referral or physician referral for a screening appointment at a hospital, physician's office, or clinic⁸]. Both of these screening routes exist in Canada and have been linked to different benefits and outcomes⁸. However, programmatic screening is set up to provide components required to effectively reduce the burden of cancer, offer methods to evaluate effectiveness, as well as provide greater protection against the potential harms of screening outside of guidelines⁸. The components of programmatic screening often include: a program policy of the screening test provided; the screening interval and who is eligible for screening; invitations and reminders about screening to eligible individuals; monitoring the follow-up of individuals who have an abnormal screening result; quality assurance; and monitoring and program evaluation.

This report quantifies programmatic participation and self-reported utilization of breast, cervical and colorectal cancer screening in Canada, both within recommended guidelines. By measuring and highlighting screening that occurs across Canada both within and outside of the CTFPHC guidelines, this report shows the progress towards reaching existing national targets^{6,8,9}. The information will help inform strategies to improve cancer screening participation and support national guideline adherence in Canada.

The History of Cancer Screening Programs Across Canada

See Appendix B for full listing of start dates for provincial/territorial screening programs (up to 2014).

Organized cancer screening programs were introduced in Canada in 1960 when women in British Columbia were first offered Pap tests to address cervical cancer screening¹⁰. For the majority of other provinces, cervical cancer screening programs were introduced in the early

2000's¹⁰. Within this past year, New Brunswick started implementing its organized cervical cancer screening program¹⁰. For the territories, there are no organized cervical cancer screening programs available at this time¹⁰.

Organized screening programs to detect breast cancer offer the most comprehensive program coverage across Canada: they were first implemented in 1988 in British Columbia⁶. The most recent breast cancer screening program to be implemented was in 2003 for the Northwest Territories. Currently breast screening program coverage extends to 12 out of 13 provinces/territories (only excluding Nunavut)⁶.

Organized colorectal cancer screening programs were first announced in Canada by three provinces in 2007 (Ontario, Manitoba, Alberta)¹¹. Manitoba was the first province to implement screening. Quebec and Newfoundland & Labrador were the last provinces to announce the planning or implementation of their screening program in 2010. No organized colorectal cancer screening programs are currently available to individuals living in the territories but exist in all ten provinces¹¹.

National Cancer Screening Guidelines

Cancer screening guidelines contain evidence-based recommendations that clinicians and the general population should consider when making decisions about cancer screening. These guidelines are updated periodically to address new technologies and tests, new evidence and any emerging issues which can impact screening outcomes for the general population¹. The evidence around the harms and benefits of screening for specific types of cancer is constantly evolving, and guidelines should be reflective of these changes¹. Although many national organizations and provincial ministries and agencies issue screening guidelines, those guidelines issued by the Canadian Task Force on Preventive Health Care (CTFPHC) will be considered as the national benchmark, for the purposes of this report (*see Appendix C for the summary of CTFPHC guidelines*). The CTFPHC is an independent panel of health care experts supported by the Public Health Agency of Canada to develop and disseminate clinical practice guidelines for primary and preventive care, based on systematic analysis of scientific evidence¹². The guideline recommendations are intended for Canadian family physicians and focus on average risk populations¹².

Although it is best practice to measure behaviors against the most recent guidelines, it is important to consider

previous recommendations when interpreting data from years prior to the release of new guidelines. Below are the details of the CTFPHC guidelines for the disease sites of interest. Overall, the most recent changes to note with respect to the CTFPHC guidelines are:

- For breast cancer screening, the recommendations to screen women aged 70-74 and to not screen those aged 40-49, as well as the screening interval (every 2-3 years) for women aged 50-74 has been added since the last revision in 2001¹.
- For cervical cancer screening, the recommendation to not screen women under the age of 25 has been added since the last revision in 1994². The previous recommendation included Pap testing for women aged 20-69².

Breast Cancer Screening

Current CTFPHC guidelines for breast cancer screening (2011) recommend that women at average risk for breast cancer who are between 50-74 years old should participate in routine mammography screening every 2-3 years¹³.

When it comes to younger women at average risk for breast cancer (those aged 40-49) the advice about mammography screening continues to be debated. For example, researchers have pointed to the potential harms that can occur when screening younger women such as over-diagnosis and unnecessary biopsies. These are important in view of the small reductions in breast cancer mortality rates¹. The CTFPHC recommends against routinely screening average risk women aged 40-49 for breast cancer with mammography¹³.

All of the CTFPHC breast cancer screening recommendations listed above are weak recommendations with moderate or low quality evidence, indicating that the majority of individuals would want to follow the suggested course of action but many others may not (*refer to Appendix C, for categories of recommendations used by the CTFPHC*). The evidence for screening women aged 70-74 is low quality compared to moderate quality for the 50-69 age group.

Other national organizations have developed different recommendations for breast cancer screening. For example, the Canadian Association of Radiologists (CAR) guidelines recommend annual mammography screening for asymptomatic women aged 40-49¹⁴. In addition, the CAR recommends that asymptomatic women aged 50-74 should undergo screening every 1-2 years, and that women over age 74 who are in good health should screen every 1-2 years¹⁴.

Cervical Cancer Screening

Cervical cancer screening guidelines were recently released in 2013 by the CTFPHC. The updated guidelines gave a strong recommendation with high quality evidence to support screening by Pap tests every 3 years in women aged 30-69². There was a weak recommendation with moderate quality evidence for screening women aged 25-29 with Pap tests every 3 years. For younger women — aged 20-24 — there was a weak recommendation with moderate quality evidence against routine screening². There was a strong recommendation with high quality evidence against routine screening for women younger than 20 years of age. As for women aged 70 and older, the guidelines note that regular cervical cancer screening via Pap testing can be ceased after three successive negative (normal) Pap test results (weak recommendation, low quality evidence)².

Guidelines for cervical cancer screening have also been issued by other national organizations such as the Society of Obstetricians and Gynecologists (SOGC). No specific start age, stop age or interval for routine Pap testing was specified in SOGC guidelines published in 2007; and the SOGC is currently in the process of updating its cervical screening guidelines¹⁵.

Colorectal Cancer Screening

A number of entry level tests can be considered for colorectal cancer screening. These screening tests include:

- Fecal tests : Guaiac fecal occult blood testing (FTg) or immunochemical fecal occult blood testing (iFOBT or FIT [fecal immunochemical test])
- Flexible sigmoidoscopy
- Colonoscopy (e.g. for individuals at high risk such as those with a family history of colon cancer)

Currently, colorectal cancer screening guidelines are under revisions by the CTFPHC. The 2001 guidelines state that asymptomatic individuals at average risk over the age of 50 should be screened for colorectal cancer using a fecal test or flexible sigmoidoscopy³.

Other national organizations, such as the Canadian Association of Gastroenterologists (CAG), have issued recommendations for colorectal cancer screening. The CAG recommends that individuals over age 50 who are at average risk for colorectal cancer should be

screened using fecal test, preferably a FIT test, every 1- 2 years through an organized screening program¹⁶. In addition, colonoscopy is not recommended as an entry level test for population-based colorectal cancer screening at this time¹⁶.

National Indicators and Targets for Programmatic Participation

The Partnership supports the continuous monitoring of breast, cervical and colorectal cancer screening performance through technical Monitoring and Evaluation working groups. This includes the development of standardized reporting definitions, and production of reports comparing program results across Canada⁸.

A number of quality performance indicators are collected for each of the three cancer types (breast, cervical and colorectal) to monitor screening from coverage, laboratory/cytology/radiologic performance, system capacity, follow-up and outcomes⁸. For the purposes of this report, participation rate will be the only indicator considered, *refer to Appendix D for complete definitions used in this report for participation rate, by cancer type*.

National targets for screening participation have been adopted through consensus of the members of the national screening networks. Target-setting is informed by reviewing current national and international evidence and literature, and is useful nationally and provincially.

In Canada, the current national targets for participation in breast, cervical and colorectal cancer screening programs are as follows:

Breast cancer screening: ≥ 70% within 30 months; women aged 50-69 should be screened using mammography within the recommended screening interval plus six months (i.e., 2 years plus 6 months). This target was adapted from a previous target of 70% within 24 months developed at a workshop hosted by the Public Health Agency of Canada several years ago. The change in interval to 30 months was made to reflect a more realistic adherence to screening interval recommendations¹⁷.

Cervical cancer screening: ≥ 80% within 42 months; women ages 21 to 69 should be screened using the Pap test within the recommended screening interval plus six months (i.e., 3 years plus 6 months). This target has been adopted at the Partnership's Cervical Cancer Screening Targets Workshop held in November, 2013.

Colorectal cancer screening: ≥ 60% within 24 months; men and women aged 50-74 should be screened using a fecal test within the recommended screening interval (i.e. 2 years). This target was developed at the Partnership's Monitoring Program Performance: Targets & Quality Indicators Workshop held in October, 2011. This target did not include a 6 month allowance for adherence.

Due to the differences in health care structures/service delivery and the significant amount of opportunistic screening occurring in Canada, both indicators (programmatic participation and overall utilization) should be monitored and reported¹⁷. The above national targets have been developed for programmatic participation; however, for the purposes of this report, we will use these targets to compare against utilization rates as this is a more comprehensive estimate to demonstrate the way in which Canadians undergo screening¹⁷.

Methods

Data Sources and Collection

The data sources used in this report include data originating from provincial/territorial screening programs and self-reported population survey data from the Canadian Community Health Survey (CCHS). The CCHS is a cross-sectional survey that collects information related to health status, health care utilization and health determinants for the Canadian population¹⁸. Analyses from these data sources allow for both programmatic participation and self-reported utilization rates to be further examined.

Provincial/Territorial Screening Program Data

This report covers the periods from 2007-2012, depending on the years for which data were available. The programmatic data for both cervical and colorectal cancer screening were gathered by analyzing aggregate, non-identifiable data. These data were previously submitted by provinces/territories to the Partnership to produce reports disseminated by the Monitoring and Evaluation working groups. Programmatic breast screening data were obtained through the Canadian Breast Cancer Screening Database (CBCSD), held by the Public Health Agency of Canada. The CBCSD contains breast cancer screening program data for all provinces and one territory⁶. For some of the indicators, data elements were not available for all provinces/territories participating in the CBCSD; provinces with missing data have been excluded from the analysis of these indicators (*see Appendix D for complete details on indicator definitions*).

Canadian Community Health Survey Data

In order to provide a more comprehensive assessment of screening uptake, it is important to report on the self-reported screening test utilization rate¹⁷. Self-reported rates were calculated using CCHS data for 2008 and 2012, by the Partnership's Data Analytics Team.

There are three content components of the CCHS: the common content, the optional content and the rapid response content¹⁸. Some of the modules are collected annually while others are collected for one or two years and rotated every two or four years¹⁸. The Pap testing, mammography and colorectal cancer screening questions are included in the optional module of the CCHS and are gathered every 4 years¹⁹.

Additionally, the questions posed for each of the screening test types cover varying time periods with fixed end points, e.g. the question "when was the last time you had a mammogram" offer the following time periods: "1 to <2 years ago", "2 to <5 years ago", etc.¹⁹. As a result, the self-reported utilization rates for mammography screening within national guidelines could only be calculated for up to 2 years.

It should be noted that with self-reported data, it is possible that some respondents have incorrectly recalled and have provided social desirable responses or overestimated their use of screening services for all three disease sites^{17,20,21}. However, these biases are similar across all survey respondents and many studies have suggested that self-reporting is fairly accurate, shows good and fair concordance, as well as overall similarities with administrative and medical record level data^{20,22-24}. Moreover, a study on mammography participation rates

found that self-reported screening test utilization rates for breast screening provided a good estimate of the combined programmatic and non-programmatic participation rate¹⁷. Self-reported CCHS data are also useful to compare rates across age groups, provinces/territories and time, as all respondents have answered the same questions; and consistent methodologies can be applied across the sample when applying inclusions/exclusions and adjustments, e.g. applying hysterectomy correction for self-reported Pap testing rates across all provinces and territories. This facilitates horizontal comparisons between all Canadian jurisdictions without requiring the use of provincial screening program data sources, which are often collected and/or adjusted differently across the country.

Indicators and Analytical Details

Indicators guiding the analysis for programmatic participation and self-reported utilization rates were identified for each disease site, *refer to Appendix D*. The age groups and screening tests considered within and outside of national guidelines were based from the most recent CTFPHC guidelines; *refer to Appendix C for complete guidelines by disease site*. More emphasis was placed on the strongly recommended guidelines by the CTFPHC when interpreting the results. The CTFPHC's strongly recommended guidelines (e.g. initiating Pap testing every three years at age 30) are interventions to be considered by most individuals, *refer to Appendix C for GRADE definitions*. All of the programmatic participation rates were also measured against the national participation targets set for each disease site.

There were some inclusion/exclusion criteria applied to the analyses. For example when calculating self-reported utilization rates for cervical cancer screening, respondents who had a hysterectomy were excluded from the numerator and denominator; and for self-reported colorectal cancer screening rates, respondents who had a colonoscopy as follow-up of a fecal test result were excluded from the numerator.

Hysterectomy correction was applied to the self-reported utilization rates by using data derived from the CCHS general survey question on hysterectomy (in the mammography module), which does not distinguish by hysterectomy type (partial and total hysterectomies)¹⁹. However, in Canada, partial supra-cervical hysterectomy is uncommon (less than 10% of all hysterectomies); and thus, the rates should not be greatly affected²⁵.

For some age groups, screening for all three disease sites is recommended. This provides an opportunity to assess the degree of participation in these individuals across all three screening sites. Measuring compliance for all recommended screening provides additional details and understanding about screening behaviour. Screening is recommended for breast, cervical and colorectal cancers in women aged 50-69 years; therefore, this population was selected for the analysis of screening uptake for all three disease sites using CCHS data.

Results

Breast Cancer Screening Participation Across Canada

Programmatic participation includes the percentage of women who have undergone a screening mammogram within 30 months as a proportion of the total Canadian census population within the age groups considered. The Canadian programmatic participation rate included all provinces and the Northwest Territories; and the screening years 2007-2009 and 2009-2011. Self-reported

utilization rates were defined as follows: women who have reported undergoing a screening mammogram within 2 years as a proportion of all women who responded. Although the CTFPHC recommends an interval of 2-3 years, CCHS data cannot be analyzed for a 3 year interval.

In Table 1, when comparing programmatic participation with self-reported utilization rates for women aged 50-74

TABLE 1

Programmatic or self-reported participation rate for at least one screening mammogram in the previous 2 years by age group, Canada (2007-2012)

Age group	2007 2009		2009 2012	
	Programmatic participation rate 30 months (2007 2009)* (%)	Self reported rate 24 months (2008)** (%)	Programmatic participation rate 30 months (2009 2011)* (%)	Self reported rate 24 months (2012)** (%)
40-49	11.0	31.0	10.9	29.0
50-69	52.8	61.0	49.3	62.0
70-74	44.9	52.0	44.3	54.0
75+	12.5	25.0	12.1	24.0

For programmatic data, 30 month interval includes: July 1st, 2007 - Dec. 31st, 2009 and July 1st, 2009 - Dec. 31st, 2011

Note:

*Numerator = Number of women within the age group as of Dec. 31st of the last year, screened within a 30-month period

Denominator = Target Population (Estimate of population as of Dec. 31st of last year, from census/forecast - prevalent cases excluded)

Excludes: Yukon and Nunavut since there is no organized screening program in place

**Numerator = A woman was deemed to have had at least one screening mammogram if her reasons were one of the following: family history, regular check-up/routine screening, age and HRT; and NOT any of the following: lump, breast problem, follow-up to breast cancer treatment or other reasons

Denominator = All women

Data source: Canadian Breast Cancer Screening Database* & Statistics Canada, Canadian Community Health Survey**

(age group recommended by the CTFPHC), both rates were higher in this group than other age groups; and this is consistent across both screening years. Self-reported utilization rates were higher than programmatic participation rates in all age groups and the differences were more pronounced in the 40-49 and 75 and older age groups. This indicates that for the screening recommended age group, most breast cancer screening is occurring within provincial/territorial programs.

When considering screening outside of the recommended age group, there appears to be a sizeable percentage of women reporting that they have been screened (refer to Table 1). During the years 2009-2012, the programmatic participation rate for women ages 40-49 was 11% and the self-reported utilization rate was 29%, which is an 18% difference. For women over the age of 75, the programmatic participation rate was 12%, and self-reported utilization rate was 24%, which is a 12% difference. These differences in programmatic participation and self-reported utilization rates reflect the variable eligibility policies of programs for these age groups; and indicate that there is mostly non-programmatic, opportunistic screening occurring in these women.

Most women participate in mammography screening every two years in order to maintain the optimal benefits from screening; however, some women undergo annual mammography screening²⁶. Annual screening rates are particularly important to calculate since they may indicate higher risk screening (with annual screening interval recommendations), or over-screening in average risk women who are screened more frequently than the recommended 2-3 year interval.

Programmatic data were used to calculate annual screening rates. CCHS data could not be used to calculate annual screening rates due to limitations of the survey questions. Annual screening is defined as the cumulative probability of women returning for a subsequent screen within 18 months of a previous one. In Table 2, women between the ages of 40-49 had the highest annual screening rate of any age group for the years 2007-2009 (66%). There are six provinces/territories that accept women for screening in this age group without a physician referral (British Columbia, Alberta, Nova Scotia, Prince Edward Island, Northwest Territories and Yukon)²⁶. In addition, annual screening rates were higher in women over the age of 70 when compared to the target age group of 50-69. In 2007-2009, the annual screening rate was 33% for women aged 70-74 and 32% for those over the age of 75.

TABLE 2

Cumulative probability of returning for a subsequent screen within 18 months* by age group, Canada (2007-2009)

	2007 2009 (index year 2007)			
	Age group			
	40 49	50 69	70-74	75+
Canada**	65.6	25.8	32.8	31.5

For programmatic data, 18 month interval includes: July 1st, 2008 - Dec. 31st, 2009
Note:

* The estimated percentage of women aged 50-68 who returned to screen within 18 months of their previous screen

** Alberta data, which were collected from the Screen Test program only, were removed from the analysis. A province-wide breast cancer screening program was implemented in March 2007

For the Northwest Territories, in the 2008 index year, follow up data was missing in 2010. Due to this missing data, Northwest Territories has been included and censored for the estimation of the Canadian rate

Also excludes: Yukon and Nunavut since there is no organized screening program in place

Women aged > 68 who returned to screen are included in the population but censored at their index screen as programs may not send recall letters to women outside this age group. Women lost to follow-up or those that did not return for a subsequent screen are excluded from the calculation

Kaplan-Meier Method was used to calculate the following rates

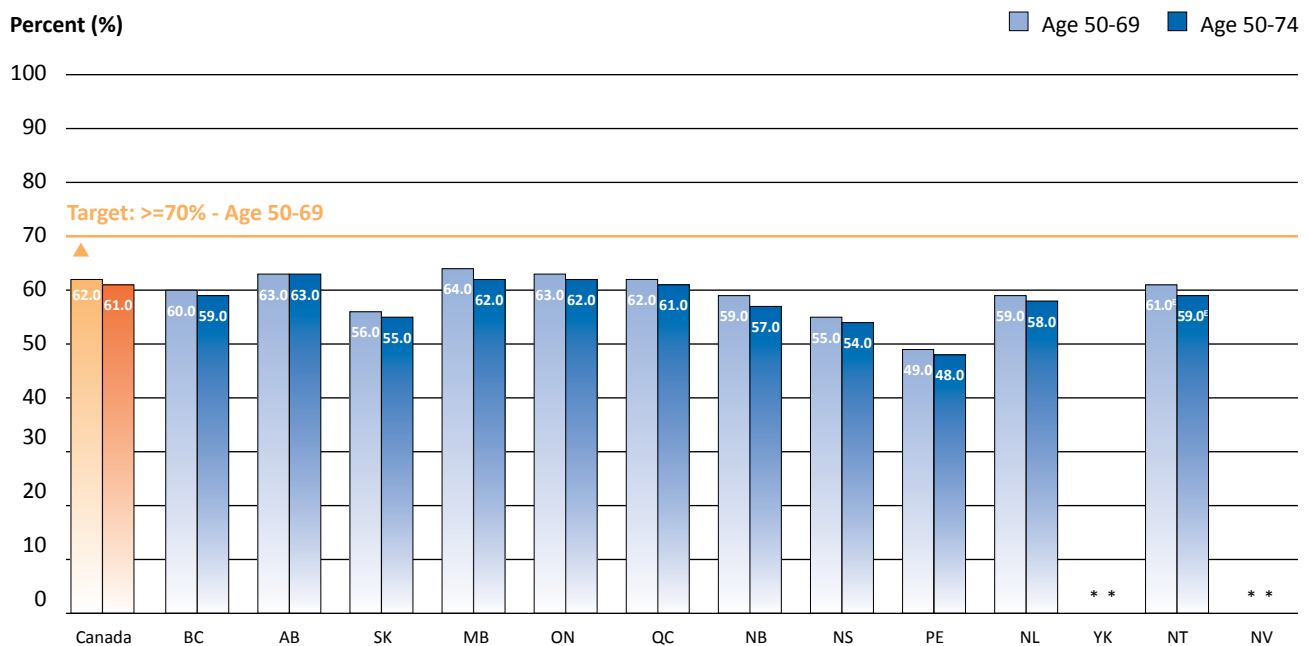
Data source: Canadian Breast Cancer Screening Database

Figure 1 demonstrates the trends in self-reported biennial mammography screening for ages 50-69 (Canadian target) and 50-74 (age group recommended by the CTFPHC) by province/territory. There was not much variation between these two age groups. The self-reported percentage of

women aged 50-69 ranged from 49-64% across provinces/territories (where data exists), compared to the Canadian estimate of 62%. For those between the ages of 50-74 this percentage ranged from 48-63%, compared to the Canadian average of 61%.

FIGURE 1

Proportion of women reporting at least one screening mammogram in the past two years, by province/territory (2012)



[†] Interpret with caution due to a large amount of variability in the estimates

** Suppressed due to unreliability by small numbers and/or to avoid residual disclosure

Note:

The age group of 50-69 is the national target age group

The age group of 50-74 is the age group considered by the CTFPHC

Numerator: A woman was deemed to have had at least one screening mammogram if her reasons were one of the following: family history, regular check-up/routine screening, age and HRT; and NOT any of the following: lump, breast problem, follow-up to breast cancer treatment or other reasons.

Denominator: All women respondents

Data source: Statistics Canada, Canadian Community Health Survey.

Cervical Cancer Screening Participation Across Canada

Programmatic participation rates (calculated by the programs) include the percentage of eligible women who have undergone at least one Pap test within 3 years. Women who have had a hysterectomy do not need routine screening, and ideally they should not be included in the calculation⁸. Not correcting for hysterectomy results in an underestimation of screening participation rates in older women⁸. Three provinces provided data for hysterectomy-corrected screening rates, while five provinces reported non-hysterectomy-corrected screening rates (depending on the date frame of the data obtained). In 2013, there was a change in the age of initiation of routine cervical cancer screening from 18 years to 25 years in the CTFPHC's updated guideline. It is important to note that screening after the age of 30 is strongly recommended based on higher quality evidence and this report has included the 30-69 age grouping². Most provincial/territorial guidelines have increased their

starting age for routine cervical screening to 21, but none have adopted 25 years as the age of initiation of screening^{2,10}. As a result of the evolving guidelines for cervical cancer, it is important to consider age groupings with different start ages, when reviewing participation rates.

In Table 3, age-standardized cervical cancer screening programmatic participation rates were compared to self-reported utilization rates for the following three age groupings: 20-69, 25-69 (age group recommended by the CTFPHC) and 30-69 (age group strongly recommended by the CTFPHC). Hysterectomy-corrected participation rates were similar in these age groupings, ranging from 69-70% (programmatic participation rates), and from 80-82% (self-reported rates). Throughout the time periods, 2007-2009 and 2009-2012, there was approximately a 10% difference observed between programmatic participation and self-reported utilization rates. The higher self-reported utilization rates may be due to rates not being an exact

TABLE 3

Age standardized percentage of women who had at least one Pap test within the past 3 years by age group, provinces combined (2007-2012)

Age group	Programmatic participation rate 2007 2009 (%)	Self reported rate 2008* (%)	Programmatic participation rate 2009 2011 (%)	Self reported rate 2012* (%)
Hysterectomy corrected (includes[†] BC and MB)				
20-69	70.2	79.9	69.0	80.0
25-69	70.6	80.2	69.5	81.9
30-69	70.2	80.3	69.1	81.9
Non hysterectomy corrected (includes AB, SK, NS, PE[‡] and NL)				
20-69	69.4	76.3	66.9	74.0
25-69	67.5	76.7	65.4	74.6
30-69	65.5	75.9	63.6	73.4

[†]ON has been excluded since data is only available from the Cancer Quality Council of Ontario; and data for the specific age breakdowns 20-24 and 25-29 were not available but is available for ages 20-69, however this has been excluded as it was age standardized to 2006 Canadian population

[‡]PE data is only included in the 2009-2011 date frame

***Note:**

Age standardized to 2011 Canadian population

Numerator: Women having had at least one Pap test during the past 3 years, with or without hysterectomy correction, dependent on the chart

Denominator: all women, with or without hysterectomy correction, dependent on the chart

Data source: Provincial Screening Programs & Statistics Canada, Canadian Community Health Survey

cut-point in time but rather an interval for one's last screening episode. For instance, with self-reported utilization rates, participants were asked when they had received their last Pap test in 6 month, 2-year or >5-year intervals.

Over time, there was not much change noted for non-hysterectomy-corrected rates over the three age groupings. In 2009-2012, programmatic participation rates ranged from 64-67% and self-reported utilization rates ranged from 73-75%. In 2007-2009 and 2009-2012, there was a 7-10% difference between programmatic and self-reported rates.

In Table 4, self-reported utilization rates are summarized by age groups within and outside of the recommended age group of 25-69 years. From 2008 to 2012, screening rates have decreased in younger women: for ages less than 20 years from 40% to 29% and for ages 20-24 from 74% to 64%. Although a decrease has been detected in women younger than 20, the screening rates are still high and must be monitored closely. The highest screening rates were seen amongst the age group for whom screening is recommended. For those over the age of 70-74, there was no difference seen over time; and the screening rates continue to be quite high at 49%. Screening rates have dropped over time for women over the age of 75 from 24% to 19%. The CTFPHC guidelines recommend that screening can be discontinued if women over the age of 70 have undergone 3 successive negative Pap tests in the last 10 years².

There are some geographical differences in utilization rates across Canada seen for women who have undergone at least one Pap test in the past 3 years for the two age groupings of 21-69 (Canadian target) and 30-69 (age group strongly recommended by the CTFPHC). In Figure 2, self-reported Pap testing for ages 21-69 ranged from 71-87% across provinces/territories; and for ages 30-69 this ranged from 69-88%. When looking at this older age grouping, estimates increased for some provinces/territories and decreased for others.

TABLE 4

Percentage of women inside and outside of the recommended age group (25-69) who reported at least one Pap test in the past 3-years by age group, Canada (2008 & 2012)

Age group	2008	2012
	Self reported rate (%)	Self reported rate (%)
<20 [†]	40.0 (35.1-44.9)	29.0 (24.5-33.5)
20-24	74.0 (70.6-77.4)	64.0 (60.2-67.8)
25-69	80.0 (78.9-81.1)	79.0 (77.9-80.1)
70-74	49.0 (44.3-53.7)	49.0 (44.8-53.2)
75+	24.0 (20.7-27.3)	19.2 (16.3-22.1)

[†]<20 only includes ages 18 and 19

Note:

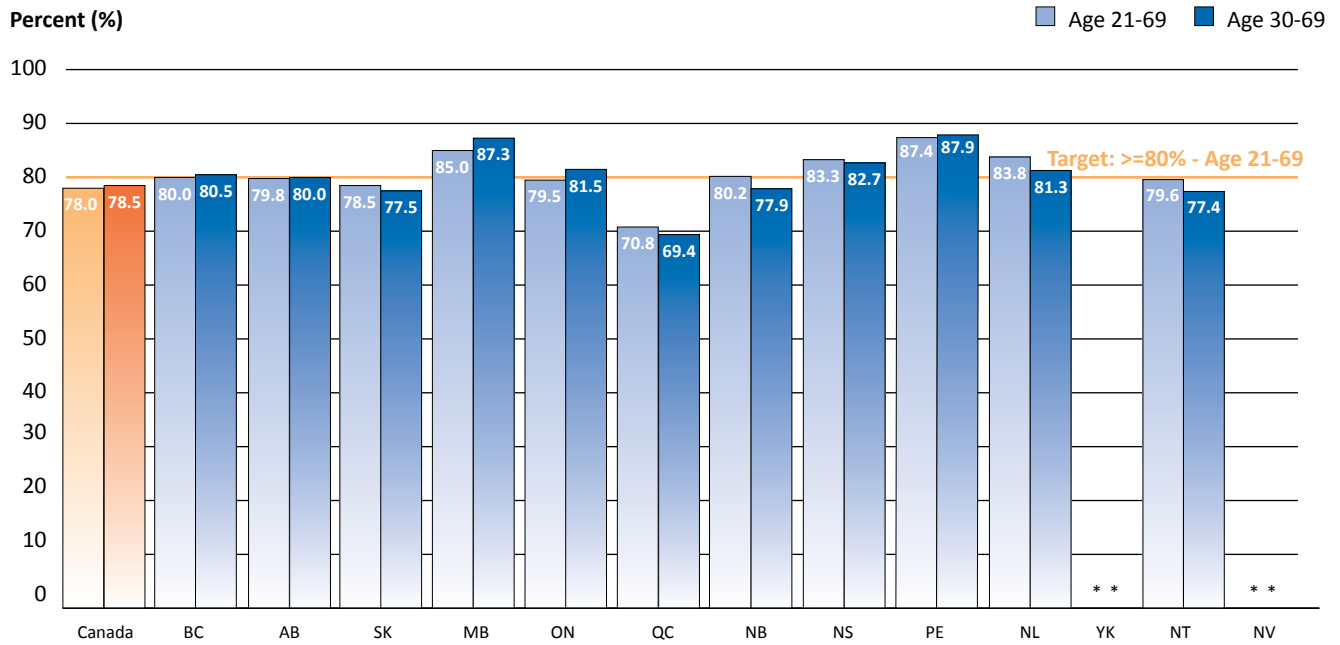
Numerator: women having had at least one Pap test during the past 3 years, with hysterectomy correction

Denominator: all women, with hysterectomy correction

Data source: Statistics Canada, Canadian Community Health Survey

FIGURE 2

Percentage[†] of women reporting at least one Pap test in the past three years, hysterectomy corrected, by province/territory (2012)



** : Suppressed due to unreliability by small numbers and/or to avoid residual disclosure

Note:

The national target age group is 21-69 years

The age group recommended by the CTFPHC is 25-69 years

[†]Age standardized to 2011 Canadian population;

For PE and NT age standardized rates, to avoid suppression issue due to small numbers, data were aggregated by 10-years age group wherever possible, from 21-29, 30-39, ..., 60-69;

For other provinces, data were aggregated by 5-years age group wherever possible, from 21-24, 25-29, ..., 65-69

Numerator: Women having had at least one Pap test during the past 3 years, with hysterectomy correction

Denominator: All women, with hysterectomy correction

Data source: Statistics Canada, Canadian Community Health Survey

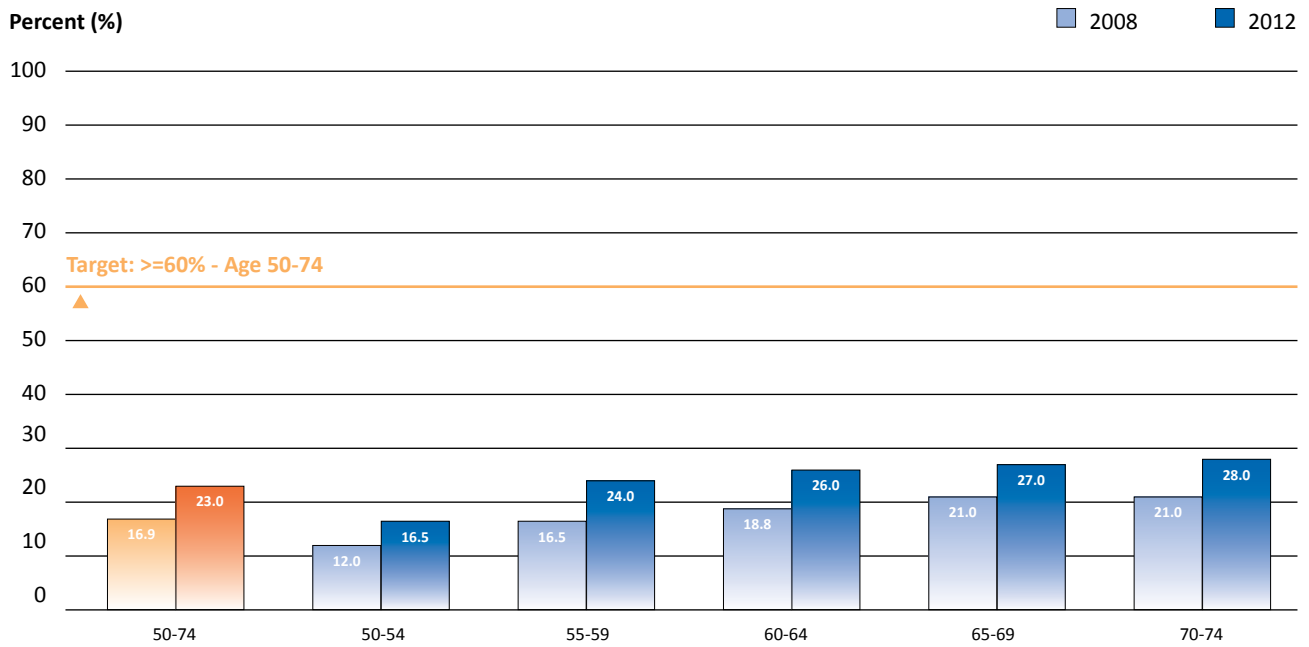
Colorectal Cancer Screening Participation Across Canada

Programmatic participation rates are defined as the percentage of individuals who have successfully undergone a fecal test within two years. Both fecal tests, guaiac fecal occult blood testing (FTg) and fecal immunochemical testing (FIT), are used in Canada. Presently, all provinces are using FIT with the exception of Ontario and Manitoba; but Ontario plans to deliver FIT shortly and Manitoba is also piloting FIT and comparing it to the currently used highly sensitive guaiac FOBT SENSEA¹¹. Among the four provinces (Saskatchewan, Manitoba, Nova Scotia and Prince Edward Island), for which data were available, programmatic participation rates ranged from 12.1% to 36.3% in 2011-2012²⁷. The geographic variability in programmatic participation rates is likely due to colorectal screening programs being implemented differently across the country (e.g. implemented in one region vs. province-wide), as well as other factors such as test types, number of samples, distribution methods, etc.¹¹.

Figure 3 illustrates the percentage of individuals aged 50-74 (Canadian target) who have undergone at least one fecal test in the past 2 years by 5-year age groups. This includes self-reported percentages for the years 2008 and 2012; those reporting family history as the reason for screening were excluded, as these individuals would not be considered at average risk. For instance, individuals at higher than average risk could be screening using a colonoscopy instead of a fecal test as this is the recommended test in those with above average risk for detecting abnormalities in the colon. Self-reported utilization rates in colorectal cancer screening increased with age and this was consistent over time. Between the years 2008 and 2012, self-reported utilization rates increased by 36% in individuals aged 50-74. Increases in utilization rates were observed across all 5-year age groups.

FIGURE 3

Percentage of population (aged 50-74) reporting at least one fecal test in the past two years, by age group, Canada (2008 & 2012)



Note:

Numerator: A respondent was deemed to have had at least one screening fecal test if his/her reasons were one of the following: regular check-up/routine screening, age and race; and NOT any of the following: family history, follow-up problem, follow-up of colorectal cancer treatment, or other reasons

Denominator: All respondents

Data source: Statistics Canada, Canadian Community Health Survey

In Table 5, self-reported utilization rates within and outside of the target age group of 50-74 years are highlighted. Screening utilization rates were low for individuals less than 50 years old, 3% in 2008 and 2012. For individuals over the age of 75, the screening utilization rates were close to the percentages observed in the target population and increased over time, 15% in 2008 and 19% in 2012.

When observing colorectal cancer screening rates, there are several modalities that should be considered. These include fecal tests and endoscopy (including both colonoscopy and sigmoidoscopy). In Table 6, self-reported utilization rates amongst survey respondents are summarized for each of the modalities by age groups within and outside of the target age group of 50-74 years. The highest percentage was noted amongst the target population for fecal test alone and this increased over time, from 12% to 16%. Screening rates differed between the younger age group (35-39 years) and the older age group (over 75 years). There were very low fecal test screening rates (2%) for ages 35-49 and this remained the same over time. In 2012, for those over the age of 75 years, 11% had undergone fecal test screening and 4% endoscopy screening, with no change over time. In contrast, there was an increase amongst those over the age 75 who had reported undergoing both a fecal test and endoscopy, from 2% to 4%.

TABLE 5

Percentage of individuals inside and outside of the target age group (50-74) who reported at least one fecal test in the past 2 years, Canada (2008 & 2012)

	2008	2012
Age group	Self reported rate (%)	Self reported rate (%)
35-49	2.8 (2.4-3.2)	2.7 (2.1-3.3)
50-74	16.9 (16.0-17.8)	23.0 (22.0-24.0)
75+	14.5 (13.2-15.8)	18.6 (17.1-20.1)

Note:

Numerator: A respondent was deemed to have had at least one screening fecal test if his/her reasons were one of the following: regular check-up/routine screening, age and race; and NOT any of the following: family history, follow-up problem, follow-up of colorectal cancer treatment, or other reasons
Denominator: All respondents

Data source: Statistics Canada, Canadian Community Health Survey

TABLE 6

Percentage of individuals inside and outside of the target age group (50-74) reporting at least one fecal test within 2 years, endoscopy within 5 years, or a fecal test and endoscopy by year, Canada (2008 & 2012)

	2008			2012		
	Self reported fecal test alone*	Self reported endoscopy alone**	Self reported both fecal test and endoscopy***	Self reported fecal test alone*	Self reported endoscopy alone**	Self reported both fecal test and endoscopy***
35-49	2.2 (1.8-2.6)	1.0 ^E (0.7-1.3)	..	2.2 (1.7-2.7)	1.0 ^E (0.6-1.4)	..
50-74	12.4 (11.6-13.2)	4.0 (3.5-4.5)	2.2 (1.9-2.5)	16.2 (15.3-17.1)	5.5 (5.0-6.0)	3.6 (3.1-4.1)
75+	10.1 (9.0-11.2)	3.4 (2.7-4.1)	1.9 (1.4-2.4)	11.3 (10.2-12.4)	3.8 (2.9-4.7)	4.0 (3.0-5.0)

.. Suppressed due to statistically too unreliable, or due to confidentiality requirements of the Statistics Act. But for this table the residual disclosure could be calculated
^E: Interpret with caution due to a rare amount of variability in the estimates

Note:

*Numerator: At least one fecal test only in the past 2 years, no colonoscopy/sigmoidoscopy in the past 5 years - for one of the reasons: regular check-up/routine, age, or race
 But not for any of the reasons: Family history, follow-up problem, follow-up of colorectal cancer treatment, or other reasons"

Denominator: All respondents

**Numerator: At least one colonoscopy/sigmoidoscopy only in the past 5 years, no fecal test in the past 2 years - for one of the reasons: regular check-up/routine, age, or race
 But not for any of the reasons: Family history, follow-up problem, follow-up of colorectal cancer treatment, or other reasons"

Denominator: All respondents

***Numerator: Both fecal test in the past 2 years and colonoscopy/sigmoidoscopy in the past 5 years - for one of the reasons: regular check-up/routine, age, or race
 But not for any of the reasons: Family history, follow-up problem, follow-up of colorectal cancer treatment, or other reasons
 If an endoscopy test was a follow-up of fecal test, it was excluded"

Denominator: All respondents

Data source: Statistics Canada, Canadian Community Health Survey

Table 7 shows the distribution of screened individuals by type of test used i.e. those who had undergone a fecal test alone (within a 2 year period), an endoscopy alone (within a 5 year period), or both fecal test and endoscopy. The highest proportions of individuals were screening using fecal test only but this had decreased over time (from 67% in 2008 to 64% in 2012). There was no change seen over time with endoscopy alone (22%). The proportion of individuals that reported undergoing both a fecal test and endoscopy had increased from 12% to 14%.

Given the recent and gradual implementation of provincial colorectal cancer screening programs across the country, jurisdictional comparisons were not included in the report

as it would be difficult to interpret the different rates across the country. In the 2014 Cancer System Performance Report, by the Partnership, provincial comparisons were presented for individuals undergoing a fecal test in the last 2 years for the years 2008 and 2012²⁸. There was an increase observed over the years for the percentage of individuals aged 50-74 that have undergone a fecal test²⁸. Self-reported fecal testing for ages 50-74 ranged from 7-42% across provinces/territories (excluding Northwest Territories and Nunavut) in 2008; compared to 13-52% in 2012 (excluding Nunavut)²⁸. Please note exclusions applied to this analysis differ from the analysis presented in the report e.g. family history was excluded in the analyses above (see Figure 3 and Table 5).

TABLE 7

Distribution of screened individuals (aged 50-74) reporting at least one fecal test within 2 years, an endoscopy within 5 years, or a fecal test and endoscopy, Canada (2008 & 2012)

Province/ Territory	2008			2012		
	Self reported fecal test alone*	Self reported endoscopy alone**	Self reported both fecal test and endoscopy***	Self reported fecal test alone*	Self reported endoscopy alone**	Self reported both fecal test and endoscopy***
Canada	66.7	21.5	11.7	64.1	21.5	14.3

Due to the random round technology, the sum of percentages for each type of test does not have to be 100

Note:

*Numerator: At least one fecal test only in the past 2 years, no colonoscopy/sigmoidoscopy in the past 5 years - for one of the reasons: regular check-up/routine, age, or race
But not for any of the reasons: Family history, follow-up problem, follow-up of colorectal cancer treatment, or other reasons"

Denominator: pool of the three types of tests

**Numerator: At least one colonoscopy/sigmoidoscopy only in the past 5 years, no fecal test in the past 2 years - for one of the reasons: regular check-up/routine, age, or race
But not for any of the reasons: Family history, follow-up problem, follow-up of colorectal cancer treatment, or other reasons"

Denominator: Pool of the three types of tests

***Numerator: Both fecal test in the past 2 years and colonoscopy/sigmoidoscopy in the past 5 years - for one of the reasons: regular check-up/routine, age, or race
But not for any of the reasons: Family history, follow-up problem, follow-up of colorectal cancer treatment, or other reasons"

If an endoscopy test was a follow-up of fecal test, it was excluded"

Denominator: Pool of the three types of tests

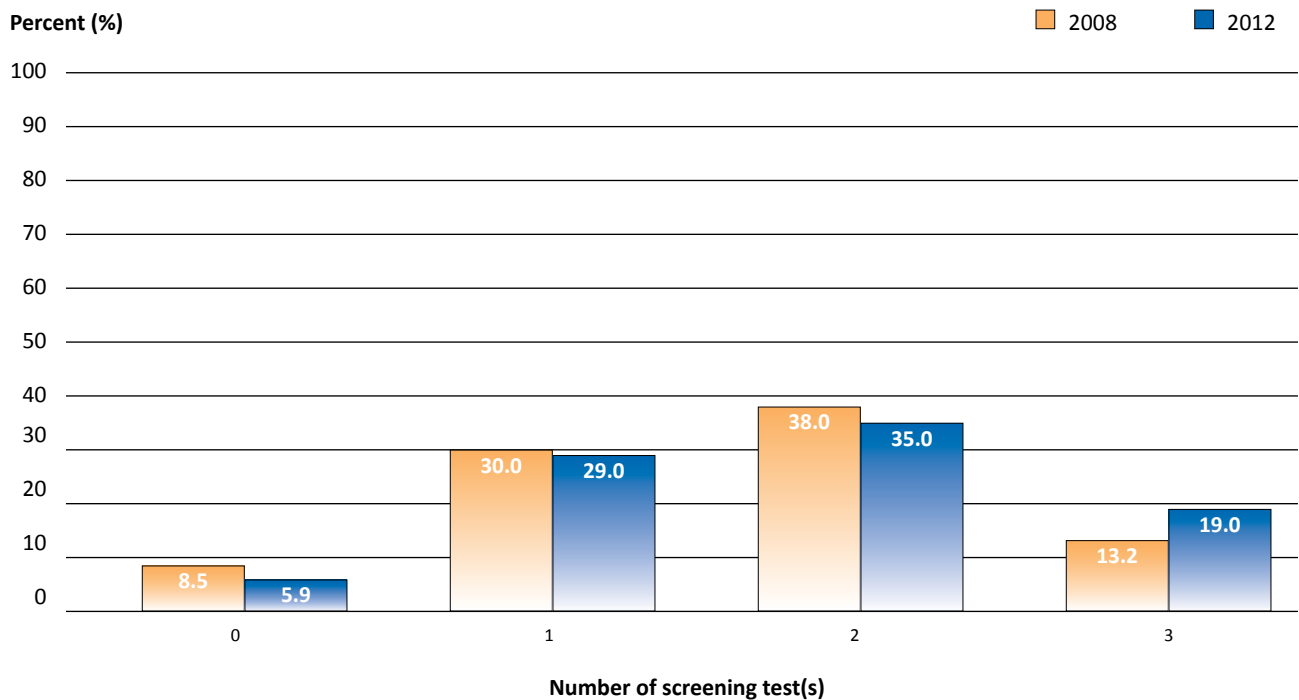
Data source: Statistics Canada, Canadian Community Health Survey

Participation in Multi-Site Screening

Since screening for all three disease sites overlap in women between the ages of 50-69, Figures 4 & 5 utilize this population to further extrapolate participation for each, as well as multiple screening tests. The screening tests included in the analysis are: mammography for breast cancer screening, Pap test for cervical cancer screening, and fecal test or endoscopy for colorectal cancer screening.

Overall, the percentage of women who have reported undergoing no screening test decreased over time, from 9% in 2008 to 6% in 2012 (refer to Figure 4). In addition, a decrease was observed for those who have reported undergoing two screening tests, 38% in 2008 to 35% in 2012. The percentage of women screening for all three disease sites has increased by 6% over the years, from 13% to 19%. Please note, Figure 4 does not include a bar

FIGURE 4
Self-reported cancer type* screening test utilization for women aged 50-69, Canada (2008 & 2012)



Note:

***Criteria for Reporting Cancer Type Screening Tests:**

Cervical Cancer Screening: Pap test during the past 3 years; *Breast Cancer Screening:* Mammography during the past 2 years, for one of the reasons: family history, regular check-up/routine screening, age and HRT; But NOT any of the following: lump, breast problem, follow-up to breast cancer treatment or other reasons; *Colorectal Cancer Screening:* Fecal test or endoscopic test: during the past 5 years, for one of the reasons: regular check-up/routine screening, age and race; But NOT any of the following: family history, follow-up problem, follow-up of colorectal cancer treatment, or other reasons

Denominator: All female respondents aged 50-69. Women with hysterectomy were not excluded because they could have participated in breast and/or colorectal screening.

Numerator 1: No screening test — Of all female respondents in denominator, who reported having had no any tests during the past years

Numerator 2: One screening test — Of all female respondents in denominator, who reported having had ONLY one of the three tests: Pap test, mammography, or fecal/endoscopic test

Numerator 3: Two screening tests — Of all female respondents in denominator, who reported having had exactly two of the three tests: Pap test, mammography, or fecal/endoscopic test

Numerator 4: Three screening tests — Of all female respondents in denominator, who reported having had exactly all the three tests: Pap test, mammography, and fecal/endoscopic test

Data source: Statistics Canada, Canadian Community Health Survey

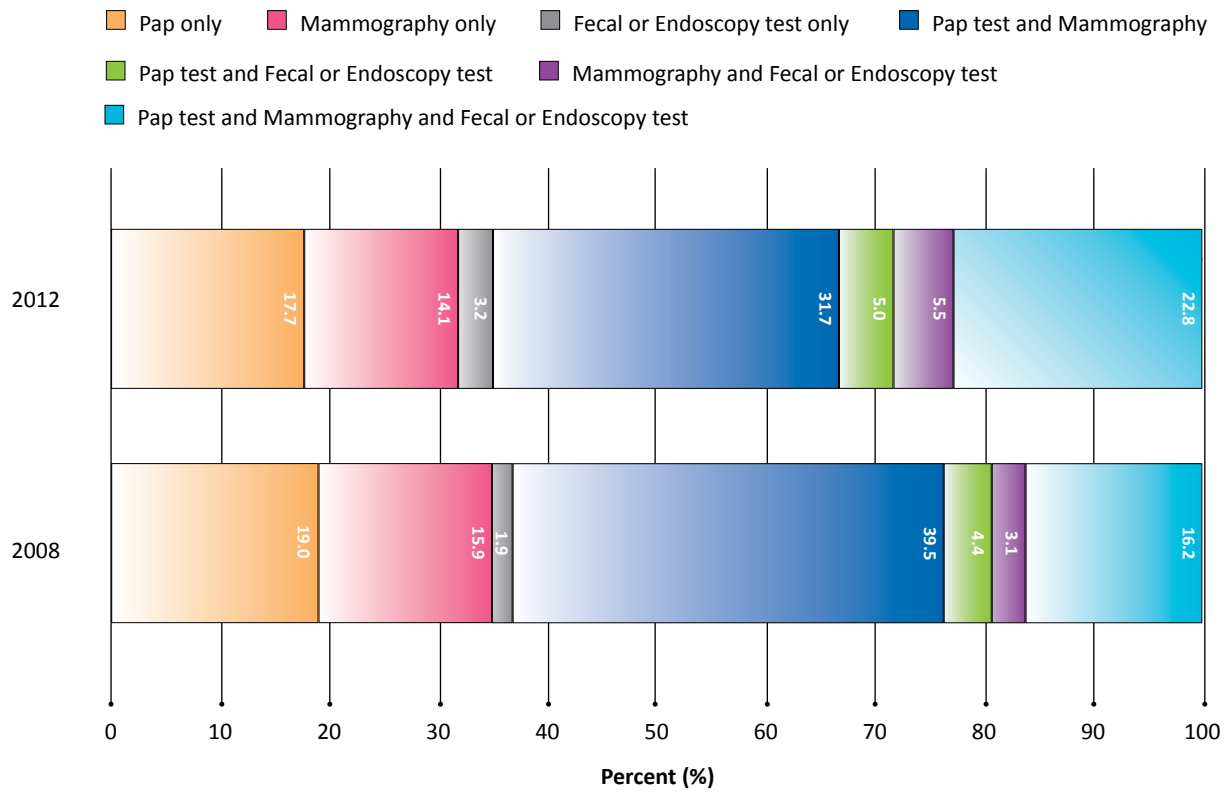
for women receiving tests for reasons other than screening, thus the total of the columns will not equal 100%.

Figure 5 shows the distribution of women between the ages of 50-69 who have reported undergoing at least one screening test in 2008 and 2012. The largest proportion of

women reported undergoing both a mammogram and Pap test. In 2012, 23% of women reported undergoing a mammogram, Pap test and fecal test or endoscopy. This increased by 7 percentage points from 2008 to 2012.

FIGURE 5

Distribution of women (aged 50-69) reported having at least one cancer type screening test*, Canada (2008 & 2012)



Note:

***Women who were deemed to have had at least one cancer type screening test:**

Pap test: During the past 3 years

Mammography: During the past 2 years, for one of the reasons: family history, regular check-up/routine screening, age and HRT; But NOT any of the following: lump, breast problem, follow-up to breast cancer treatment or other reasons

Fecal test or endoscopic test: During the past 5 years, for one of the reasons: regular check-up/routine screening, age and race; But NOT any of the following: family history, follow-up problem, follow-up of colorectal cancer treatment, or other reasons

If a respondent reported having had both a fecal test and endoscopic test, they would be considered as having one test

Endoscopic test as a follow-up of fecal test was excluded

Denominator: All female respondents aged 50-69, reporting having had at least one of the three tests: Pap test, mammography or fecal/endoscopic test

Data source: Statistics Canada, Canadian Community Health Survey

Discussion

High screening uptake is necessary to demonstrate the success of any population-based screening program²⁹. National targets for screening participation rates have been set by expert consensus, based on international experience and feasibility. Data presented in this report show that targets across all three screening sites have not yet been achieved; however, both breast and cervical cancer screening are close to reaching the target and colorectal cancer screening has made good progress.

In breast cancer screening, utilization rates (including both programmatic and non-programmatic screening) were approximately 10% below the national target of $\geq 70\%$. All provinces/territories were achieving or very close to achieving the national cervical cancer screening participation target of $\geq 80\%$. Lower participation rates may have been attributed to the lack of provincial cervical screening programs with organized promotion and recruitment activities. The national target of $\geq 60\%$ for participation in biennial fecal testing is not yet achieved, with the Canadian self-reported rate at 23% in 2012; however, colorectal screening programs have only recently been implemented in Canada beginning in 2007, and the screening rates have been increasing since that time. Because there are multiple tests involved in colorectal screening, including the use of colonoscopy as a follow-up test for a positive fecal test, measuring whether individuals are up-to-date for colorectal cancer screening (due to having had any of the tests recently) would

provide useful information. This would further compliment the test-specific participation rate indicator.

National screening guidelines such as those of the CTFPHC provide health care providers with up to date recommendations on screening based on the latest evidence. One of the aims of these guidelines is to increase evidence-based screening (screening within guideline recommendations) and minimize routine screening practices that are not recommended. The findings suggest that screening participation and utilization was highest in the recommended age groups and intervals. However, there was also a significant amount of screening occurring outside of the recommended age groups and intervals of the CTFPHC guidelines.

Mammography screening outside of the recommended 50-74 year age group was apparent for women aged 40-49 (29%) and women over the age of 75 (24%). The CTFPHC recommends a screening interval of 2-3 years, however

there is a sizeable return to screening occurring within 18 months of a previous screen [for ages 40-49 (66%) and 70-74 (32%)].

In cervical cancer screening, self-reported, hysterectomy-corrected utilization rates for the age group 25-69, for which routine screening is recommended by the CTFPHC, was stable over time at 79% in 2012. The proportions of women outside of this age group who participated in screening decreased over time between 2008 and 2012, but rates were significant, particularly in the younger women. Screening in teenagers results in much more harm than good, and this negative impact will only become worse if HPV vaccinated teenagers continue to be screened².

In 2012, the self-reported utilization of biennial fecal testing was 23% for the target age group of 50-74. While this is much lower than the target of $\geq 60\%$, it represents a 36% increase in utilization between 2008 and 2012. This indicates there is good progress being made in Canada with colorectal cancer screening as more programs have moved from the planning to implementation phase. Even with colorectal cancer screening increasing prior to the launch of programs, which may be explained by the existence of national guidelines and some physician incentive programs, screening rates still remain low. Therefore, barriers to colorectal cancer screening must be completely understood and systematically addressed by screening programs³⁰.

It is evident that more Canadians are undergoing both fecal tests and endoscopy for colorectal cancer screening over time. In 2012, 4% of the respondents reported undergoing both a fecal test and endoscopy. This is approximately a doubling of the percentage observed in 2008. Amongst respondents who reported undergoing colorectal screening in 2012, 14% reported using both tests. Undergoing two screening tests could represent over-screening in these individuals as the CTFPHC does not recommend multiple screening tests. Further investigation is needed to determine the factors associated with multiple test use.

To better understand cancer screening uptake, it is beneficial to examine all tests administered to individuals. After women reach the age of 50, screening for breast, cervical and colorectal cancer is recommended. Thus, the participation of women aged 50-69 in all three screening tests provides interesting information about the patterns of uptake. Between 2008 and 2012, a smaller percentage of women reported undergoing no screening test (9%

versus 6%) and more women reported undergoing three types of cancer screening tests (13% versus 19%). Interestingly, the Cancer Quality Council of Ontario reported similar results using program and fee-for-service billing code data. The results indicated that approximately 188,000 Ontario women (21%) aged 50-69 were up-to-date with all three recommended cancer screening tests (mammogram, Pap test and fecal test) in 2012³¹.

There was an increase in the proportion of women reporting colorectal cancer screening, together with mammography and Pap testing (16 to 23% for all three screening tests). Given the relatively stable breast and cervical screening rates over time, it is likely that women have added colorectal screening to their previously established screening routines. It is encouraging that only 6% of women reported undergoing no screening. While colorectal cancer screening is increasing, only 19% are currently up-to-date for all three screening tests. There is evidence that women who actively participate in one screening test are more likely participate in other cancer screening. This was demonstrated in a recent study where European-American women screening for colorectal cancer were more likely to participate in breast and cervical cancer screening³². Even though rates might be high in some types of screening, it will be important to address inequities to accessing cancer screening.

Conclusion

This report has examined participation and utilization rates for breast, cervical and colorectal cancer screening by the age groups and screening intervals recommended by the CTFPHC guideline recommendations; and also compared the rates with national participation targets.

Screening that is not according to the guidelines of the CTFPHC was common, both in 2008 and 2012. The impact of screening in age groups younger than the recommended age groups may include higher false positive rates, very low detection rates, and opportunity costs – as resources to serve the targeted age groups are diverted to provide services for individuals for which they are not recommended. Traditional screening indicators report on participation in the recommended screening age groups, assisting screening programs to determine if their recruitment efforts have been effective; however, in order to optimize the benefit/harm ratio for the population, attention will also need to be paid to minimizing screening outside of guidelines.

The targets for breast and cervical screening were close to being met in 2012. However, colorectal screening rates have a long way to go before reaching the national target of $\geq 60\%$. Being the newest screening initiative of the three cancer screening sites, there are lessons learned in recruitment and retention that can be transferred from the experience of breast and cervical screening, to facilitate the continued increase in participation over time. One of the challenges of colorectal screening is that there are at least three tests that have been used for screening – fecal tests, flexible sigmoidoscopy and colonoscopy. This makes the measurement of participation in colorectal

screening more complex, and it will be necessary to adjust indicator definitions as screening guidelines are updated for the tests, age groups, and intervals recommended.

Regular monitoring of multiple aspects of screening participation and utilization will help pinpoint trends in participation patterns for within and outside of guidelines. The recommended screening age groups and intervals for all three cancer screening sites have changed over time, as the scientific evidence is continually evolving. Thus, revisions will need to be made to national targets as new evidence and updated national guidelines emerge, in order to facilitate alignment of screening program recruitment efforts with the most recent recommendations.

There are limitations to relying solely on self-reported data for screening test utilization as it does not capture what is truly happening outside of programmatic screening. These data include a mix of individuals who may have varying levels of risk for cancer i.e. not all are average risk, and who are reporting screening and/or diagnostic uses of tests²². Therefore, other opportunities to capture more explanatory data for participation outside of screening programs should be added to enrich the analysis.

References

- Canadian Task Force on Preventive Health Care, Tonelli M, Connor Gorber S, Joffres M, Dickinson J, Singh H, et al. Recommendations on screening for breast cancer in average-risk women aged 40-74 years. *CMAJ Can Med Assoc J J Assoc Medicale Can*. 2011 Nov 22;183(17):1991-2001.
- Canadian Task Force on Preventive Health Care, Dickinson J, Tsakonas E, Conner Gorber S, Lewin G, Shaw E, et al. Recommendations on screening for cervical cancer. *CMAJ Can Med Assoc J J Assoc Medicale Can*. 2013 Jan 8;185(1):35-45.
- Dunfield L, Shane A, Fitzpatrick-Lewis D, Bacchus M. Protocol: Screening for Colorectal Cancer. Canadian Task Force on Preventive Health Care. 2013 [cited 2014 Jul 27]. Available from: <http://canadiantaskforce.ca/perch/resources/colorectal-protocol-v2-3final1.pdf>
- Committee on Cancer Statistics. Canadian Cancer Statistics 2014. Toronto: Canadian Cancer Society; 2014 May [cited 2014 Jul 21]. Available from: <http://www.cancer.ca/~media/cancer.ca/CW/publications/Canadian%20Cancer%20Statistics%202014/Canadian-Cancer-Statistics-2014-EN.pdf>
- Canadian Cancer Society. Prevention & screening. Be Aware. Canadian Cancer Society. 2014 [cited 2014 Jul 21]. Available from: <http://www.cancer.ca/en/prevention-and-screening/be-aware/family-genetics/?region=on>
- Canadian Partnership Against Cancer. Organized Breast Cancer Screening Programs in Canada: Report on Program Performance in 2007 and 2008. Toronto: Canadian Partnership Against Cancer; 2013 Feb [cited 2014 Jul 21]. Available from: http://www.cancerview.ca/idc/groups/public/documents/webcontent/organized_breast_cancer.pdf
- Canadian Cancer Society's Steering Committee on Cancer Statistics. Canadian Cancer Statistics 2011. Toronto: Canadian Cancer Society; 2011.
- Canadian Partnership Against Cancer. Cervical Cancer Screening in Canada: Monitoring Program Performance 2009-2011. Toronto: Canadian Partnership Against Cancer; 2013 [cited 2014 Jul 27]. Available from: http://www.cancerview.ca/idc/groups/public/documents/webcontent/cervical_cancer_report.pdf
- Canadian Partnership Against Cancer. Colorectal Cancer Screening in Canada: Program Performance Results Report, January 2009 - December 2011. Toronto: Canadian Partnership Against Cancer; 2013 Dec.
- Canadian Partnership Against Cancer. Cervical Cancer Screening Guidelines Across Canada: Environmental Scan. Toronto: Canadian Partnership Against Cancer; 2014 [cited 2014 Jul 27]. Available from: http://www.cancerview.ca/cv/portal/Home/PreventionAndScreening/PSPProfessionals/PSScreeningAndEarlyDiagnosis/CervicalCancerControlInCanada?_afwLoo p=3002735221339914&lang=en&_afwWindowMode=0&_adf.ctrl-state=shzy48s2_4
- Canadian Partnership Against Cancer. Colorectal Cancer Screening Guidelines Across Canada: Environmental Scan. Toronto: Canadian Partnership Against Cancer; 2014 [cited 2014 Jul 27]. Available from: http://www.cancerview.ca/cv/portal/Home/PreventionAndScreening/PSPProfessionals/PSScreeningAndEarlyDiagnosis/ColorectalCancerScreeningPage?_afwLoo p=3011758442714914&lang=en&_afwWindowMode=0&_adf.ctrl-state=1c9kff1m1c_4
- The Canadian Task Force for Preventive Health Care. About the CTFPHC. The Canadian Task Force for Preventive Health Care. [cited 2015 Jan 9]. Available from: <http://canadiantaskforce.ca/about-us/about-the-ctfphc/>
- Canadian Task Force on Preventive Health Care. Screening for Breast Cancer (2011). Canadian Task Force on Preventive Health Care; 2011 [cited 2014 Jul 27]. Available from: <http://canadiantaskforce.ca/ctfphc-guidelines/2011-breast-cancer/>
- Canadian Association of Radiologists. CAR Practice Guidelines and Technical Standards for Breast Imaging and Intervention. Canadian Association of Radiologists; 2012 [cited 2014 Jul 27]. Available from: http://www.car.ca/uploads/standards%20guidelines/20131024_en_breast_imaging_practice_guidelines.pdf
- Murphy KJ, Howlett R. Screening for Cervical Cancer. *Can Psychiatr Assoc CPA*. 2007 Aug;29(8):27-31.
- Leddin DJ, Enns R, Hilsden R, Plourde V, Rabeneck L, Sadowski DC, et al. Canadian Association of Gastroenterology position statement on screening individuals at average risk for developing colorectal cancer: 2010. *Can J Gastroenterol J Can Gastroenterol*. 2010 Dec;24(12):705-14.
- Doyle GP, Major D, Chu C, Stankiewicz A, Harrison ML, Pogany L, et al. A review of screening mammography participation and utilization in Canada. *Chronic Diseases and Injuries in Canada*; 2011; 31:152-6.
- Statistics Canada. Canadian Community Health Survey - Annual Component (CCHS). Statistics Canada; 2014 [cited 2014 Sep 22]. Available from: <http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=3226>
- Statistics Canada. Canadian Community Health Survey (CCHS) Annual Component - 2012 Questionnaire. Ottawa: Statistics Canada; 2012 p. 80-4.
- Caplan LS, McQueen DV, Qualters JR, Leff M, Garrett C, Calonge N. Validity of women's self-reports of cancer screening test utilization in a managed care population. *Cancer Epidemiol Biomark Prev Publ Am Assoc Cancer Res Cosponsored Am Soc Prev Oncol*. 2003 Nov;12(11 Pt 1):1182-7.
- Lofters AK, Moineddin R, Hwang SW, Glazier RH. Does social disadvantage affect the validity of self-report for cervical cancer screening? *Int J Womens Health*. 2013;5:29-33.

22. White A, Vernon SW, Eberth JM, Tiro JA, Coan SP, Abotchie PN, et al. Correlates of self-reported colorectal cancer screening accuracy in a multi-specialty medical group practice. *Open J Epidemiol*. 2013 Feb;3(1):20–4.
23. Khoja S, McGregor SE, Hilsden RJ. Validation of self-reported history of colorectal cancer screening. *Can Fam Physician Médecin Fam Can*. 2007 Jul;53(7):1192–7.
24. Vernon SW, Tiro JA, Vojvodic RW, Coan S, Diamond PM, Greisinger A, et al. Reliability and validity of a questionnaire to measure colorectal cancer screening behaviors: does mode of survey administration matter? *Cancer Epidemiol Biomark Prev Publ Am Assoc Cancer Res Cosponsored Am Soc Prev Oncol*. 2008 Apr;17(4):758–67.
25. Public Health Agency of Canada. Chronic Diseases and Injuries in Canada - Prevalence of self-reported hysterectomy among Canadian women, 2000/2001–2008. Ottawa: Public Health Agency of Canada; 2013 [cited 2015 Jan 12]. Available from: <http://www.phac-aspc.gc.ca/publicat/cdic-mcbc/34-1/ar-05-eng.php>
26. Canadian Partnership Against Cancer. Breast Cancer Screening Guidelines Across Canada: Environmental Scan. Toronto: Canadian Partnership Against Cancer; 2014 [cited 2014 Oct 6]. Available from: http://www.cancerview.ca/cv/portal/Home/PreventionAndScreening/PSPProfessionals/PSScreeningAndEarlyDiagnosis/BreastCancerScreening?_afLoop=4995232034836000&lang=en&_afrWindowMode=0&_adf.ctrl-state=mzwz3tlqb_85
27. Canadian Partnership Against Cancer. Colorectal Cancer Screening in Canada: Monitoring & Evaluation of Quality Indicators – Results Report, January 2011 – December 2012. Toronto: Canadian Partnership Against Cancer; 2014.
28. Canadian Partnership Against Cancer. The 2014 Cancer System Performance Report. Toronto: Canadian Partnership Against Cancer; 2014.
29. Gimeno García AZ. Factors influencing colorectal cancer screening participation. *Gastroenterol Res Pract*. 2012;2012:483417.
30. Zarychanski R, Dennis J, Singh H. Challenges of population-based colorectal cancer screening and the importance of time-trend analysis when evaluating system change. *Cancer Epidemiol*. 2013 Dec;37(6):957–8.
31. Cancer Quality Council of Ontario. Integrated Screening Participation - CSQI 2014. Cancer Quality Council of Ontario. [cited 2015 Jan 12]. Available from: http://www.csqi.on.ca/ptjourney/screening/integrated_screening_participation/
32. Wirth MD, Brandt HM, Dolinger H, Hardin JW, Sharpe PA, Eberth JM. Examining connections between screening for breast, cervical and prostate cancer and colorectal cancer screening. *Colorectal Cancer*. 2014 Jun;3(3):253–63.
33. Grades of Recommendation, Assessment, Development, and Evaluation (GRADE) | Canadian Task Force on Preventive Health Care. [cited 2015 Jan 15]. Available from: <http://canadiantaskforce.ca/methods/grade/>

Appendix A

Joint Cancer Screening Committee Membership

Diane Major	Chair, Joint Cancer Screening Initiative (Canadian Partnership Against Cancer)
Jennifer Payne	Chair, Monitoring & Evaluation Working Group of the Canadian Breast Cancer Screening Network (Canadian Partnership Against Cancer)
Gregory Doyle	Chair, Canadian Breast Cancer Screening Network (Canadian Partnership Against Cancer)
Kathleen Decker	Chair, Monitoring & Evaluation Working Group of the Pan-Canadian Cervical Cancer Screening Network (Canadian Partnership Against Cancer)
Meg McLachlin	Chair, Pan-Canadian Cervical Cancer Screening Network (Canadian Partnership Against Cancer)
Winson Cheung	Chair, Monitoring & Evaluation Working Group of the National Colorectal Cancer Screening Network (Canadian Partnership Against Cancer)
David Armstrong	Chair, National Colorectal Cancer Screening Network (Canadian Partnership Against Cancer)
Heather Bryant	Vice President, Cancer Control (Canadian Partnership Against Cancer)
Verna Mai	Expert Lead, Screening & Early Detection (Canadian Partnership Against Cancer)
Rami Rahal	Interim Director, Screening & Early Detection (Canadian Partnership Against Cancer)
Neetu Shukla	Analyst, Screening & Early Detection (Canadian Partnership Against Cancer)

Appendix B

Provincial/Territorial Population-Based Screening Program Start Dates/Program Announcements by Cancer Type

	Inception of Breast Cancer Screening Program	Inception of Cervical Cancer Screening Program	Date of Program Announcement for Colorectal Cancer Screening Program
Nunavut	N/A	N/A	N/A
Northwest Territories	2003	N/A	N/A
Yukon Territory	1990	N/A	N/A
British Columbia	1988	1960	2009
Alberta	1990	2003	2007
Saskatchewan	1990	2003	2009
Manitoba	1995	2000	2007
Ontario	1990	2000	2007
Quebec	1998	N/A	2010
New Brunswick	1995	2014-2015	2009
Nova Scotia	1991	1991	2009
Prince Edward Island	1998	2001	2009
Newfoundland & Labrador	1996	2003	2010

Appendix C

Canadian Task Force of Preventive Health Care Guidelines for Cancer Screening

Recommended screening amongst average risk population:

a. **Breast cancer:** For women aged 50-69, routine screening with mammography is recommended every 2-3 years (*weak recommendation, moderate quality evidence*); For women aged 70-74, routine screening with mammography is recommended every 2-3 years (*weak recommendation, low quality evidence*)¹⁰.

b. **Cervical cancer:** For women aged 25-29, routine screening for cervical cancer is recommended every 3 years (*weak recommendation, moderate quality evidence*); For women aged 30-69, routine screening for cervical cancer is recommended every 3 years (*strong recommendation, high quality evidence*)².

c. **Colorectal cancer:** There is good evidence to support the inclusion of annual or biennial fecal occult blood testing (*A recommendation*) and fair evidence to include flexible sigmoidoscopy (*B recommendation*) in the periodic health examinations of asymptomatic individuals over age 50 years³.

Screening not recommended amongst average risk population:

a. **Breast cancer:** For women aged 40-49, routine screening with mammography is not recommended (*weak recommendation, moderate quality evidence*)¹³. Screening at age >75 is also referred to screening outside of the current guidelines. Women obtaining a mammogram at an interval greater than once every 2-3 years are considered to be screening outside of the current guidelines.

b. **Cervical cancer:** For women aged <20, routine screening for cervical cancer is not recommended (*strong recommendation, high quality evidence*); For women aged 20-24, routine screening for cervical cancer is not recommended (*weak recommendation, moderate quality evidence*); For women aged ≥70 who have been adequately screened (i.e. 3 successive negative Pap tests in the last 10 years) it is recommended that routine screening for cervical cancer may cease (*weak recommendation, low quality evidence*)². Women who have obtained more than

one Pap test every 3 years are considered to be screening outside of the current guidelines.

c. **Colorectal cancer:** There is insufficient evidence to make recommendations about whether one or both of FOBT and sigmoidoscopy should be performed (*C recommendation*); there is insufficient evidence to include or exclude colonoscopy as an initial screen in the periodic health examination (*C recommendation*)³. Individuals <50 who have screened for colorectal cancer using FOBT are considered to be screening outside of the current guidelines. Also, individuals who have screened more than once every 1- 2 years for colorectal cancer using FOBT are considered to be screening outside the current guidelines.

Defining GRADEs of Recommendations by the Canadian Task Force of Preventive Health Care

Strong recommendations³³:

- Most individuals in this situation would want the recommended course of action.
- Most individuals should receive the intervention
- Adopt as policy

Weak Recommendations³³:

- The majority of individuals in this situation would want the suggested course of action, but many would not.
- Different choices will be appropriate for individual patients and clinicians must help each patient arrive at a management decision
- Policy-making will require substantial debate

Appendix D

Project Indicators and Definitions for Participation by Cancer Type

Breast Cancer Screening (Mammography)			
Indicator	Age Groups	Years	Data Source
Programmatic Participation Rate – percentage of women who have a screening mammogram within a 24 month / 30 month period as a proportion of the population	40-49; 50-69; 70-74; 75+	2007-2009 and 2008-2010 and 2009-2011	Canadian Breast Cancer Screening Database
Annual Screening Rate – the percentage of women aged 50-68 and those outside of this target age group who are screened within 18 months of their previous screen	40-49; 50-69; 70-74; 75+	2007-2009	Canadian Breast Cancer Screening Database
Self-Reported Rate – women who have received a mammogram within the past 2 years	<40; 40-49; 50-69; 70-74; 75+	2008 and 2012	Canadian Community Health Survey
Cervical Cancer Screening (Pap Test)			
Indicator	Age Groups	Years	Data Source
Programmatic Participation Rate – women who have had at least one Pap test during the timeframe	20-24; 25-29; 30-39; 40-49; 50-59; 60-69; and 20-69; 25-69; 30-69"	2007-2009 and 2009-2011	Provincial Screening Programs
Self-Reported Rate – women who reported having at least one Pap test within a 3 year period	<20; 20-24; 25-29; 30-34; 35-39; 40-44; 45-49; 50-54; 55-59; 60-64; 65-69; 70+; and 20-69; 21-69; 25-69; 30-69	2008 and 2012	Canadian Community Health Survey
Colorectal Cancer Screening (Fecal Test, Endoscopy)			
Indicator	Age Groups	Years	Data Source
Programmatic Participation Rate- individuals who have had at least one fecal test during the timeframe	50-74; and 5 year breakdowns	2009-2010 and 2011-2012	Provincial Screening Programs
Self-Reported Rate – individuals at average risk reporting a fecal test in the past 2 years	<50; 50-74; 75+; and 5 year breakdowns	2008 and 2012	Canadian Community Health Survey
Self-Reported Rate – individuals reporting a fecal test within the past 2 years, or colonoscopy/sigmoidoscopy within 5 years, or both fecal test in the past 2 years and a colonoscopy/sigmoidoscopy within 5 years	<50; 50-74; 75+	2008 and 2012	Canadian Community Health Survey
Self-Reported Distribution – individuals reporting a fecal test within the past 2 years, or colonoscopy/sigmoidoscopy within 5 years, or both fecal test in the past 2 years and a colonoscopy/sigmoidoscopy within 5 years	50-74	2008 and 2012	Canadian Community Health Survey

1 University Avenue, 3rd Floor
Toronto, Ontario, Canada M5J 2P1
tel: 416.915.9222 toll-free: 1.877.360.1665
www.partnershipagainstcancer.ca

