CANCER*Care*
A PROGRAM OF EASTERN HEALTH

2018 PROVINCIAL CANCER REPORT

NEWFOUNDLAND
& LABRADOR

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EXECUTIVE SUMMARY

About two in five Canadians will develop cancer in their lifetime.
About one in four will die from it.

Examining pan-Canadian cancer data can reveal important information about the burden of disease on a national level and can identify variations in the burden of disease across the country. Entities such as Statistics Canada, the Public Health Agency of Canada, the Canadian Partnership Against Cancer (CPAC) and the Canadian Cancer Society have a Canada-wide mandate and perform key roles in the analysis and dissemination of data related to cancer burden. Measures of disease burden include incidence, mortality, survival and prevalence.

In addition to disease burden, other measures of performance along the cancer care system trajectory are indicators of how well a jurisdiction is progressing in the cancer control arena. CPAC usefully outlines a number of domains along the trajectory including prevention, screening, diagnosis, treatment, person-centered perspective, appropriateness and long-term outcomes. Reporting on performance indicators in each of these domains and having the ability to make inter-provincial standardized comparisons is critical to advance the cancer control agenda. Equally important as Pan-Canadian reporting is the ability to conduct intra-provincial analysis and comparisons. Drilling down beyond the level of the province can provide valuable context to clinicians, researchers and health care managers, amongst others. Analytic work at the **intra**-provincial level must be accomplished by capitalizing on available resources within the province as well as liaising with national stakeholders.

This report highlights a number of provincial indicators in the screening, diagnosis, person-centered perspective and long-term outcomes domains.

Wherever possible, breakdowns are provided to the level of regional health authority. It is hoped that this report will provide useful context regarding variations in cancer burden and cancer system performance across our province.

The Provincial Cancer Care Program of Newfoundland and Labrador would like to acknowledge the generous analytic support provided by CPAC and the Newfoundland and Labrador Centre for Health Information in the development of this report.

PROVINCIAL OVERVIEW

Newfoundland and Labrador (NL) has a population of 519,535 according to 2016 Census data. With respect to the delivery of health care services, the province is divided into four regional health authorities (RHAs) – Eastern, Central, Western and Labrador-Grenfell Health.

The most populous RHA is Eastern Health and the least populous is Labrador-Grenfell Health. Eastern Health is responsible for a number of provincial programs including the Provincial Cancer Care Program. The Map of Newfoundland and Labrador Divided by RHA, on the following page, outlines the percentage of the total provincial population residing in each region and the geographic area of the province that corresponds to each RHA.

The Cancer Care Program was established when the Newfoundland Cancer Treatment and Research Foundation came under the mandate of Eastern Health. The program is responsible for the delivery of cancer care services throughout the province of NL; which includes a range of services across the continuum of care. Services include cancer screening programs, systemic therapy, radiation therapy, supportive care, clinical trials and cancer surveillance. The program is responsible for four cancer centers, including the Dr. H. Bliss Murphy Cancer Centre in St. John's and three regional centers in Gander, Grand Falls and Corner Brook. A number of services, such as radiation therapy, are only available in St. John's. The program is responsible for the provincial systemic therapy budget and provides oversight for systemic therapy (also known as chemotherapy) and oversight for chemotherapy delivery in various hospitals across the province. The provincial nature of the program involves ongoing collaboration with other RHAs.

The indicators in this report are presented under the categories of Screening, Diagnosis, Person-Centered Perspective and Long Term Outcomes.

LEGEND:

★ Cancer Centre

👤 Population Count

% Proportion of Provincial Population

■ Labrador-Grenfell RHA

■ Western RHA

■ Central RHA

■ Eastern RHA

LABRADOR
👤 36,440
% 7.1 PERCENT

CENTRAL
👤 93,485
% 18.2 PERCENT

WESTERN
👤 96,485
% 15.2 PERCENT

EASTERN
👤 306,625
% 60 PERCENT

SUMMARY of INDICATORS

Indicators reported for each category are listed in the following table:

CANCER CARE SYSTEM CATEGORY	INDICATOR
SCREENING	Self-reported Pap test rate
	Pap test rate: Provincial Cervical Screening Database
	Self-reported mammogram rate
	Breast screening rate: Provincial Breast Screening Program Database
	Self-reported fecal occult blood test (FOBT) rate
	FIT kits requested in 2016
DIAGNOSIS	Cervical screening pre-cancer detection rate
	Wait time from abnormal mammography to resolution
	Breast cancer detection rate
	Wait time from abnormal FIT test to colonoscopy
	Adenoma detection rate in patients with a positive FIT
PERSON-CENTERED PERSPECTIVE	Screening for Distress results
	Ambulatory Oncology Patient Satisfaction Survey results
LONG TERM OUTCOMES	Age-standardized incidence rates for all types of cancers and four most common cancers
	Age-standardized mortality rates for all types of cancers and four most common cancers
	Relative survival ratios for all types of cancers and three of the most common cancers
	Age-standardized incidence and mortality rates for top seven cancers in the province

DATA SOURCES

Cancer screening data come from one or more iterations of the Canadian Community Health Survey (CCHS) administered between 2011 and 2014. The CCHS is a cross-sectional survey that collects information related to health status, health care utilization and health determinants for the Canadian population. It relies upon a large sample of respondents and is designed to provide reliable estimates at the health region level every two years. Data are also extracted from provincial cancer screening databases for Screening and Diagnosis indicators. Data are for the years 2014-2016.

Data for the Person-Centred Perspective Indicators are derived from two sources: 1) the Edmonton Symptom Assessment System-Revised (ESAS-r); and 2) the Ambulatory Oncology Patient Satisfaction Survey (AOPSS). The ESAS-r is a validated instrument that is widely used across Canada to screen for distress in relation to a number of symptoms commonly experienced by cancer patients. Screening for Distress was implemented as a standardized practice in the Cancer Care Program in early 2015. All ESAS-r results are entered into a database that is used to track trends in patient distress over time. The AOPSS is also a validated tool that is used to assess patient satisfaction

with care in the ambulatory oncology setting. This survey was administered to a population of patients across the province in fall of 2016. The NL submission file to the Statistics Canada Canadian Cancer Registry is the primary source of data to calculate long-term outcomes. Annual submission files from 2008 to 2015 were used to derive the long-term outcome indicators. The methodology utilized by CPAC for reporting age-standardized incidence and mortality rates and survival ratios were also applied to the long-term outcome indicators in this report to ensure standardization of process and comparability with CPAC reports. These indicators focus on the four main cancer disease sites – breast, prostate, lung and colorectal.

Age-standardized incidence and mortality rates are also reported for the top seven cancers in NL between 2008 and 2015. These data were extracted from Canadian Cancer Society report. Due to the fact that the Canadian Cancer Society and CPAC use different methodologies to calculate standardized rates, some discrepancies in reported rates may exist.

The data used in this report are the most recent years' available data from each of the data sources at the time of report writing. Detailed definitions for each indicator and its calculation methodology can be found in Appendix A. The crude incidence and mortality rates and relative survival ratios are not provided in this report. However, for interested readers, crude rates can be acquired by contacting the Cancer Care Program, Eastern Health.

1.0 SCREENING

The components of an organized screening program include a well-defined target population with an acceptable and affordable screening tool, broadly available to the general population at risk, high quality processes for collection and processing of screening tests, effective and efficient treatment modalities, and capacity to reduce the burden of disease for the population at risk[1,2].

Screening programs exist in NL for three different cancer types: cervical, breast and colorectal. The goal of these programs is to reduce cancer mortality by detecting and treating pre-cancer or cancer early. In the case of breast and colorectal screening, non-programmatic, also called opportunistic, screening occurs outside of these programs where the responsibility for screening and follow-up is on the individual, health care facility, and/or physician.

All cervical cancer screening is coordinated through an organized screening program in NL. The model for organized cervical cancer screening in NL was introduced in 2003 with a phased-in approach taking into consideration available infrastructure and geography. By 2008 the Cervical Screening Initiative (CSI) was linked to all RHAs and by 2010 the provincial cervical cytology registry was established. The Papanicolaou test, or Pap test, is used for cervical screening. A Pap test involves the removal and examination of cells from the cervix and is designed to identify abnormal changes in these cells (precancerous or cancerous) before females show any signs or symptoms. The CSI program recommends that females initially have a Pap test once a year for three consecutive years starting at age 21 years. If results are normal, the Pap test should be performed once every three years as long as results remain normal. Females with abnormal Pap test histories are encouraged to continue getting Pap tests on a yearly basis or as recommended by their health care provider.

Programmatic breast screening was first implemented in NL in 1996. Prior to 2014, the age range for screening was 50-69, but has subsequently been modified to 50-74 to reflect updated guidelines. Mammography is the test used to screen for breast cancer. Mammograms can detect abnormalities in the breast before they can be felt and are capable of identifying 85-90% of all breast cancers[3,4]. In NL, the Breast Screening Program recommends that females between the ages of 50-74 years should a have mammogram every two years. Women in the target age range can enroll in screening without a doctor's referral. Programmatic breast screening is offered in three sites in the province: St. John's, Gander and Corner Brook. Non-programmatic or opportunistic screening also occurs at several health care sites throughout the province. For females at an elevated risk of developing breast cancer, mammograms are recommended on a yearly basis.

CERVICAL

Test: Papanicolaou (Pap) Test

Recommended Age: 21-69 years old

Testing Interval: Once a year for three consecutive years, then every three years thereafter if results are normal.

BREAST

Test: Mammography

Recommended Age: 50-74 years old

Testing Interval: Every two years; yearly for females who are considered to be high risk.

COLORECTAL

Test: Fecal Test

Recommended Age: 50-74 years old

Testing Interval: Every two years.

Programmatic colorectal cancer (CRC) screening is recommended for people aged between of 50-74. A fecal test is used for screening and is able to detect blood in the stool that cannot be seen with the naked eye. In NL, the Colon Cancer Screening Program (NLCCSP) uses a screening test that can be done at home called the Fecal Immunochemical Test, or FIT kit as long as results are normal, this test should be administered every two years. The fecal sample is then analyzed in a laboratory to search for hidden blood. The NLCCSP was launched in the Western Health region of the province over a three-year period (Central Health, 2013; Labrador-Grenfell Health, 2014; Eastern Health, 2015). Opportunistic screening is sometimes conducted outside the screening program using another type of fecal test, called the guaiac test. Colonoscopy is still also used for screening in some instances which does not align with evidence-based guidelines for colorectal screening of those at average risk for the disease.

Data presented on screening participation in this report come from two sources. The first is the CCHS which is administered annually by Statistics Canada. The CCHS is conducted on a representative sample of

respondents from each of the provinces' and territories' full populations. Screening questions are not necessarily asked in every iteration of the CCHS, so the most recent year of available data varies. Indicators included in the screening domain focus on the three screening programs that exist in NL for cervical, breast and CRC. The participation rates provided are self-report data and include individuals who were screened through both programmatic and opportunistic screening (colorectal and breast) and programmatic screening only (cervical screening). The second source of screening participation data comes directly from the database associated with the operations of each screening program. These two sources of data can provide an interesting comparator on screening participation; self-report versus programmatic database.

Cervical Screening

Figure 1.1 shows the self-reported Pap test participation rates for women aged 18-69 years in NL (the recommended screening age range at time of reporting). Rates are shown for the province and by RHA. In 2012 and 2013 respectively, 76.4% and 77.9% of women in the province reported having had a pap test within the last three years. These rates approach, but do not reach, the target of 80% set by the Pan-Canadian Cervical Screening Network (PCCSN)[5]. Labrador-Grenfell Health was the only RHA that met the target for both years reported.

FIGURE 1.1 PERCENTAGE OF WOMEN (AGED 18-69 YEARS) REPORTING AT LEAST ONE PAP TEST IN THE PAST THREE YEARS, BY RHA, 2012 AND 2013

Data Source: Statistics Canada's Canadian Community Health Survey, Share File, 2012,2013
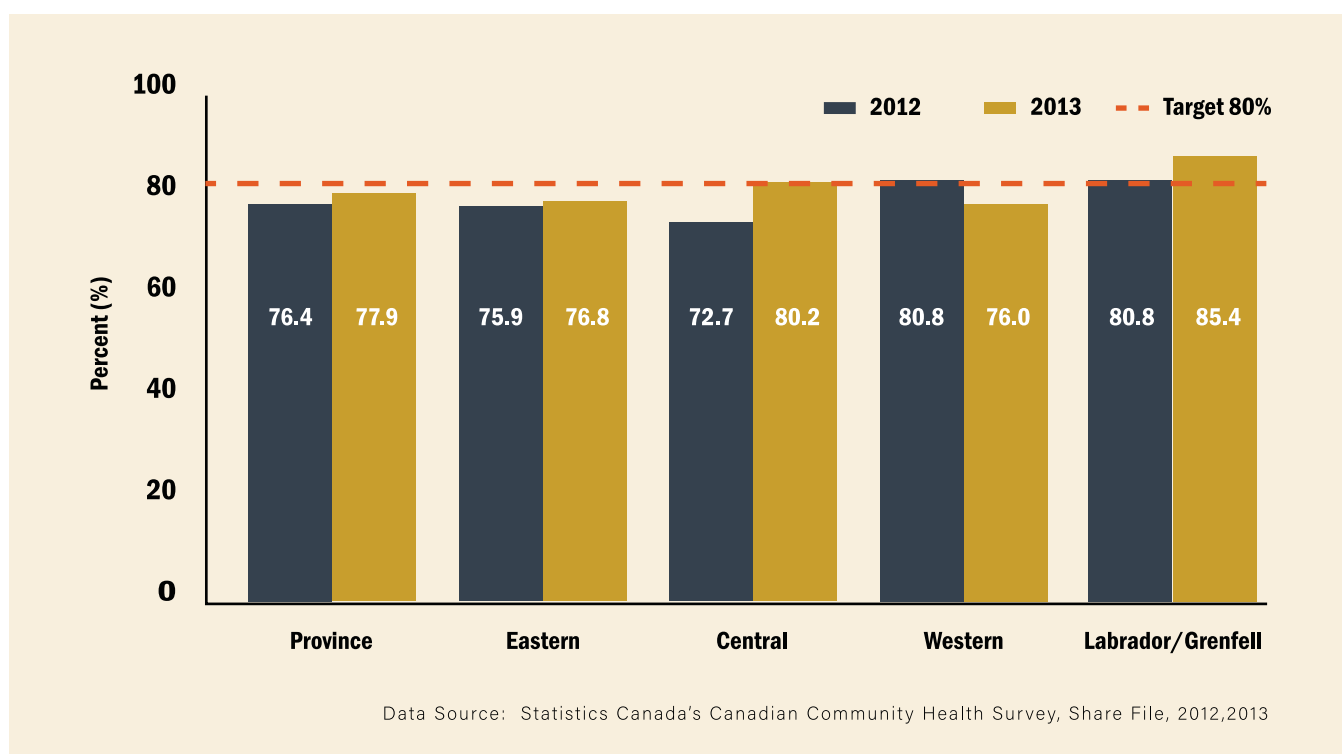
From the cervical screening program database the participation rate in cervical cancer screening is measured as the number of eligible women, aged between 21 and 69, having at least one Pap test in a three year (36 month) period. This age cohort reflects screening guidelines for this reporting period. For the 2014 to 2016 reporting period, the program reported 60% of women aged 21 to 69 participating in cervical screening in NL (Figure 1.2). Rates are also broken down by RHA and did not vary a great deal between regions. Eastern Health and Labrador-Grenfell Health cannot be reported separately at the present time and, as such, are grouped together. A disparity in the proportion of women participating in cervical cancer screening is observed when comparing the CCHS self-report rate to the rate tracked by the program. The program reported rate is considerably lower than the self-reported rate. The screening interval is standardized across both data sources (36 months) but the age cohort varies slightly. However, this is not likely to account for the marked difference seen. **The difference may be reflective of the accuracy of self-report or recall rates versus database tracking rates**. Based on the programmatic participation rate there is room for improvement to bring screening participation up to the national target.

Breast Screening

Figure 1.3 shows the self-reported mammogram rate for 2011 and 2012 for women aged 50-69 years (as per evidence-based guidelines identifying the screening cohort for this reporting period). The target for participation set by the Canadian Breast Cancer Screening

In 2012 and 2013, close to 80% of women in Newfoundland and Labrador reported having a pap test in the last three years.

Network (CBCSN) is 70% of all women in the appropriate age range[6]. Except Eastern Health, all RHAs met the target rate in one or both of the reporting years based on respondent self-report to the CCHS.

Comparatively, Figure 1.4 shows the breast screening participation rate as tracked by the screening program. Participation rates displayed here are for women aged between 50 and 74 which reflects updated screening

FIGURE 1.2 PERCENTAGE OF WOMEN (AGED 21-69 YEARS) HAVING AT LEAST ONE PAP TEST, BY RHA, 2014-2016

Data Source: Provincial Cervical Cancer Screening Database, 2014-2016
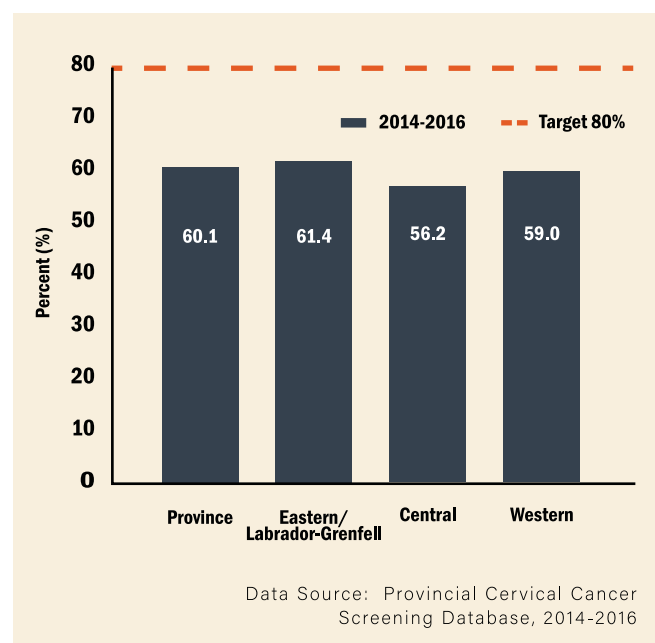
guidelines to align with the most current guideline. **As highligted previously, programmatic screening is offered at three locations in the province, St. John's, Gander and Corner Brook.** The catchment area for the St. John's Breast Screening Centre is the Avalon Peninsula; the catchment area for the Gander Breast Screening Centre covers the area of Terra Nova to Glenwood, including all coastal communities from Salvage to Port Albert; and the catchment area for the Corner Brook Breast Screening Centre is the area covered by the Western Health Authority. The screening participation rate for the breast screening program is calculated using the population of women in the target age range for each catchment area

as the denominator and the number of women screened in a two year interval (2015 or 2016) within the target age range as the numerator. This does not take into account women who are screening outside of the program. The participation rate in the breast screening program is higher in the Gander (Central Health East) region than it is in the Avalon (Eastern Health) or Corner Brook (Western Health) regions. However, looking at the self-report data in Figure 1.3, Western respondents report a higher participation rate in 2012 than any of the other RHAs. Overall, self-reported rates are higher than rates tracked by the program. Some of the discrepancy may be due to the fact that the data definitions, populations targeted and time periods are different for these two

FIGURE 1.3 PERCENTAGE OF WOMEN (AGED 50-69 YEARS) REPORTING A MAMMOGRAM IN THE PAST TWO YEARS, BY RHA, 2011 AND 2012
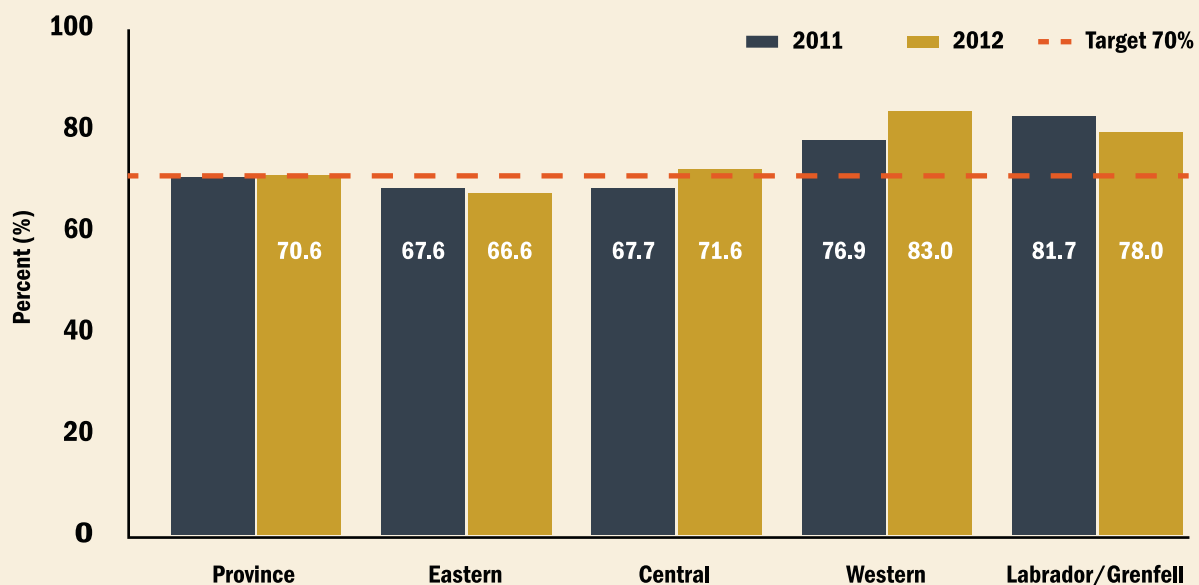
Data Source: Statistics Canada's Canadian Community Health Survey, Share File, 2011, 2012
Estimates with letter E indicate high sampling variability and should be used with caution.

participation indicators. The disparity in self-report versus program tracking, as seen with cervical cancer, may also account for some of the difference.

Colorectal Screening

Figure 1.5 presents the fecal occult blood test (FOBT) self-reported participation rate among the population aged 50-74 in NL as well as in each of the RHAs. All regions were considerably below the 60% target rate set by National Colorectal Cancer Screening Network (NCCSN)[7]. The provincial FOBT screening rate was 20.5% in 2011-2012, and decreased very slightly to 19.5% in 2013-2014. For the two reporting periods, the FOBT participation rates in both Central Health (30.9% and 28.9%) and Western Health (32.5% and 29.6%) were significantly higher than those of the other health authorities. The disparity in participation rates between health authorities can likely be explained, in part, by the implementation of the colon cancer screening program in the province. This program was launched in the Western Health region in July 2012. The program was then phased in to the other RHAs over three years (Central Health, 2013; Labrador-Grenfell Health, 2014; Eastern Health, 2015). It is anticipated that FOBT screening participation will increase as the screening program becomes more established. The self-reported rate can include individuals screened using the FIT test distributed by the NCCSN or the older guaiac test which is distributed outside the parameters of the program.

Data Source: Provincial Cervical Cancer Screening Database, 2015-2016
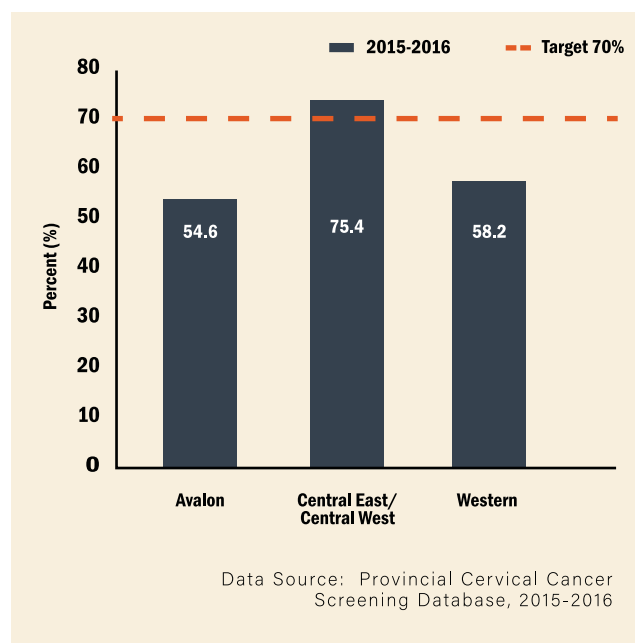
With respect to programmatic screening for colon cancer, traditional participation rates are not yet calculated by RHA because the program is relatively new and was not fully implemented throughout the province until mid-2015. At present, data are available on the number of requests for a FIT kit by RHA. During the 2016/2017 fiscal year the program received 14,860 requests for a screening kit. This was a substantial increase over the previous fiscal year when 9064 test kits were requested; and a threefold increase from fiscal year 2014/2015 when 4630 test kits were requested. This indicates that participation in this program is growing.

FIGURE 1.5 PERCENTAGE OF THE POPULATION (AGED 50-74 YEARS) REPORTING A FECAL OCCULT BLOOD TEST (FOBT) IN THE PAST TWO YEARS, BY RHA, 2011-2012 AND 2013-2014

Data Source: Statistics Canada's Canadian Community Health Survey, Share File, 2011-12,2013-14
Estimates with letter E indicate high sampling variability and should be used with caution
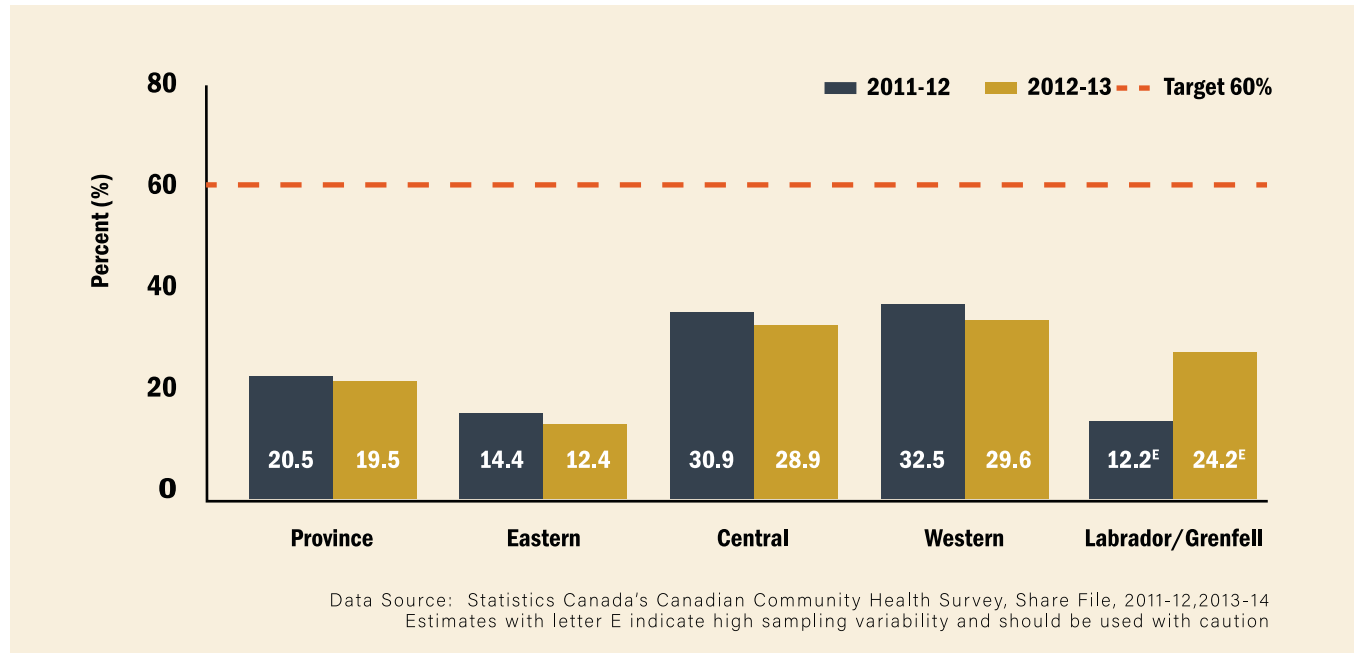
FIGURE 1.6 FIT KITS REQUESTED, BY RHA, 2016

Data Source: Provincial Colon Cancer
Screening Database, 2016
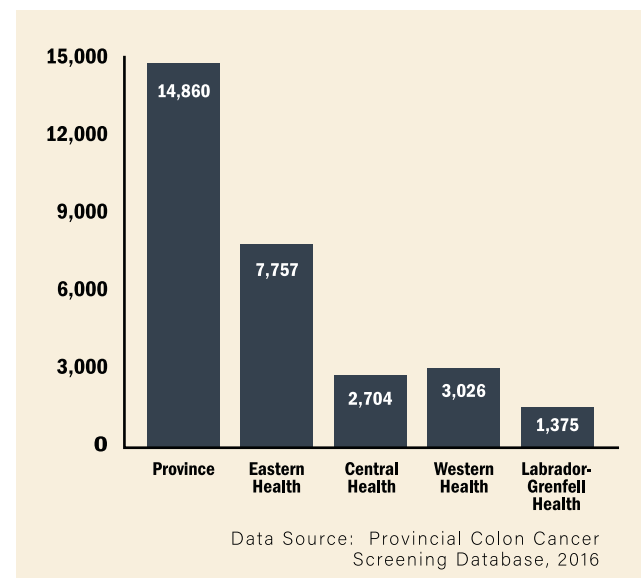
2.0 DIAGNOSIS

**Data for the diagnosis indicators comes from the screening program databases. As such, data for these indicators represent those who were screened through programmatic screening, a concept which was described previously in this report.**

It is important to note that there may be cases who underwent opportunistic screening that resulted in a cancer diagnosis. The pathway and time to diagnosis for these individuals may differ from that of people screened within an organized program. Diagnosis indicators focus on various elements of the diagnostic pathway including time to receive resolution of an abnormal screening test, the detection of pre-cancerous lesions and adenomas (secondary prevention) and the detection of cancer at an early and more treatable stage (tertiary prevention). Secondary prevention is possible in the case of cervical and CRC, while in breast cancer, only tertiary prevention is possible.

Cervical Cancer
Pre-Cancer Detection: The Cervical Screening Program defines the pre-cancer detection rate as the number of pre-cancerous lesions detected per 1,000 women in the previous 12 months. Pre-cancerous lesions include biopsies with a high-grade squamous intraepithelial lesion (HSIL) result. Cervical screening can find and treat lesions before they progress to

cancer. This measure provides feedback about cervical cancer prevention and control. Women in the youngest age group (21-29) have the highest rate of detected pre-cancerous lesions per 1,000 women screened, followed by those in

FIGURE 2.1 NUMBER OF WOMEN PER 1,000 OF THE POPULATION WITH A PRE-CANCEROUS LESION FOUND ON SCREENING, NL 2011-2013

Data Source: Provincial Cervical Cancer Screening Database, 2011-2013
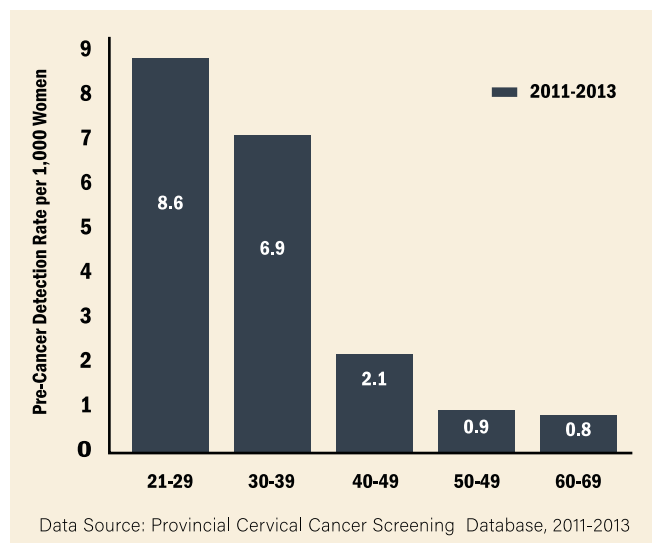
the 30-39 age group. For the three remaining age groups, the rate declines considerably.

Breast Cancer
A quality indicator in breast screening is the length of time between an abnormal mammogram and resolution of that abnormal screen. There is a wait time associated with determining whether an abnormal screening test is indicative of cancer or not. These wait times can have an impact on patient quality of life and are tracked to ensure that there is no impact of wait time on prognosis.

Wait Time from Abnormal Screen to Resolution: Figures 2.2 and 2.3 show the median and 90th percentile wait times for resolution of an abnormal breast screen. Separate targets exist for women who did not require a tissue biopsy in order to receive a resolution as opposed to those who did require a biopsy.

The median (or 50th percentile) wait time from abnormal breast screen to resolution without a tissue biopsy was three weeks for Eastern and Western Health and four weeks for Central Health.

None of the regions attained the 90 percentile target of five weeks. Western Health came the closest at six weeks followed by Eastern Health and Central Health at 9 and 12 weeks respectively.

TARGET FOR WOMEN
NOT REQUIRING BIOPSY:

90% of women should have a resolution within **5 WEEKS**

TARGET FOR WOMEN
REQUIRING BIOPSY:

90% of women should have a resolution within **7 WEEKS**

Targets were set by the CBCSN[6].
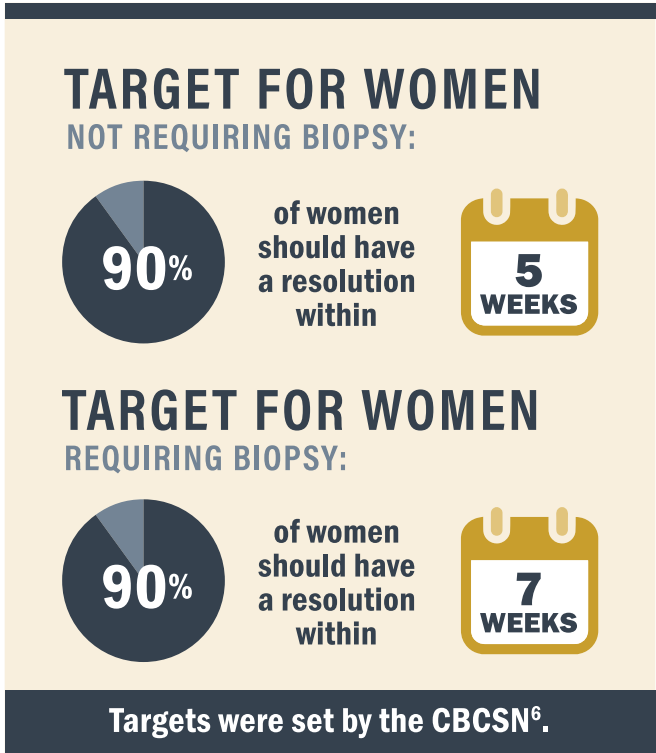
Data Source for Figure 2.2 and 2.3:
Provincial Breast Cancer Screening Program Database, 2014

Median Wait Time
90th Percentile Wait Time
Target ≤ 5 Weeks

Proportion Within Target

EASTERN 82% 3 9
CENTRAL 65% 4 12
WESTERN 89% 3 6

Weeks

*There are no data available for Labrador-Grenfell Health as programmatic breast screening does not exist in this region.

For abnormal screens requiring a tissue biopsy the median wait time was eight weeks in Eastern and Central Health and five weeks in Western Health. All regions were well over the 7 week target – 21 weeks for Central and Western and 23 weeks for Eastern. The proportion of

Median Wait Time
90th Percentile Wait Time
Target ≤ 7 Weeks

Proportion Within Target

EASTERN 40% 8 23
CENTRAL 33% 8 21
WESTERN 69% 5 21

Weeks

*There are no data available for Labrador-Grenfell Health as programmatic breast screening does not exist in this region.

women requiring a tissue biopsy who received a resolution in 7 weeks or less was 33% in Central, 40% in Eastern and 69% in Western.

Breast Cancer Detection: Figure 2.4 shows the breast cancer detection rate per 1000 breast screens for women aged 50-69 who participated in the provincial breast cancer screening program in 2014. The cancer detection rate varied across RHAs. The highest rate was seen in the Central region followed by Western and then Eastern. In 2014, the breast cancer detection rate ranged from 6.81 per 1000 screens in Eastern Health to 10.43 per 1000 screens in Central Health.

FIGURE 2.4 BREAST CANCER DETECTION RATE PER 1000 SCREENS[†] FOR WOMEN (AGED 50-69 YEARS), BY RHA[*], NL, 2014

Data Source: Provincial Breast Cancer Screening Program Database, 2014

[*] There are no data available for Labrador-Grenfell Health as programmatic breast screening does not exist in this region.

[†] Cancer detected within the screening program only.

Rates for Newfoundland & Labrador are higher than for Canada as a whole.

2011-2012 NATIONAL RATE	TARGET DETECTION RATE	
5.1 CANCERS DETECTED — PER — **1000** SCREENS	**>5** CANCERS DETECTED — PER — **1000** INITIAL SCREENS	**>3** CANCERS DETECTED — PER — **1000** SUBSEQUENT SCREENS

Colon Cancer

Wait Time from Abnormal FIT to Follow-Up Colonoscopy: Figure 2.5 shows that in 2015, patients from Western Health had shortest median (or 50th percentile) wait time and patients from Eastern Health had the longest median wait time from time of abnormal FIT result to follow-up colonoscopy. The

median wait time for both male and female patients ranged from 18 days in Western Health to 62 days in Eastern Health. The 90th percentile wait time ranged from 65 days in Central Health to 121 days in Eastern Health. **None of the RHAs had achieved the national target of colonoscopy completion within 60 days of an abnormal fecal test** (set by Canadian Association of Gastroenterology [CAG])[8]. With the exception of Eastern Health, at least 80% of patients received colonoscopy after an abnormal fecal test within the target wait time. One

possible reason for the delay seen in Eastern Health is that the colon screening program was not officially launched until 2015 with programmatic FIT positive colonoscopies commencing in fall of 2015. Dedicated endoscopy time was provided to the screening program as a result of endoscopy unit expansion at St. Clare's Hospital to accommodate positive screening test results that required follow up colonoscopy. The data presented in Figure 2.5 reflect FIT positive colonoscopies that occurred prior to official launch and provision of dedicated endoscopy time.

FIGURE 2.5 MEDIAN AND 90TH PERCENTILE WAIT TIMES FROM ABNORMAL FECAL TEST TO FOLLOW-UP COLONSCOPY, BY RHA OF RESIDENCE AND SEX, NL, 2015

PROPORTION WITHIN TARGET

Males Median Wait Time
Females Median Wait Time
Males 90th Percentile Wait Time
Females 90th Percentile Wait Time
Target ≤ 60 Days

EASTERN*
Males 45% 62 121
Females 44% 62 117

CENTRAL
Males 86% 42 65
Females 83% 44 73

WESTERN
Males 83% 18 74
Females 84% 18 69

LABRADOR GRENFELL
Males 80% 35 70
Females 80% 42 71

Days
0   30   60   90   120   150

Data Source: Provincial Colon Cancer Screening Program Database, 2015
*Colorectal cancer screening program launched in Eastern Health mid-2015

Adenoma Detection Rate: The adenoma detection rate (ADR) is the proportion of screening colonoscopies performed by a physician that detect at least one histologically confirmed colorectal adenoma or adenocarcinoma (cancer). Tracking the ADR has been recommended as a quality benchmark. Figure 2.6 shows ADRs among patients who received a colonoscopy following an abnormal fecal test in 2015. The detection rate was similar across RHAs and ranged from 52.7% in Eastern Health to 58.2% in Western Health for both sexes combined. Broken down by gender, the adenoma detection rates were higher in male patients than female patients. For male patients, the rates ranged from 61.6% in Central Health to 68.2% in Labrador-Grenfell Health. For female patients, the rates ranged from 35.0% in Labrador-Grenfell Health to 53.6% in Western Health. In Labrador-Grenfell Health, the difference of adenoma detection rate by sex was the largest (68.2% in males vs. 36.0% in females).

Due to the high yield of histologically significant findings among patients in the province, the target ADR rate is set at 50%, meaning 50 scopes out of every hundred should yield a clinically significant finding.

FIGURE 2.6 ADENOMA DETECTION RATE (PER 100 ABNORMAL FECAL TEST PATIENTS SCOPED), BY RHA AND SEX, NL, 2015

Data Source: Provincial Colon Cancer Screening Program Database, 2015
*Colorectal cancer screening program launched in Eastern Health in 2015
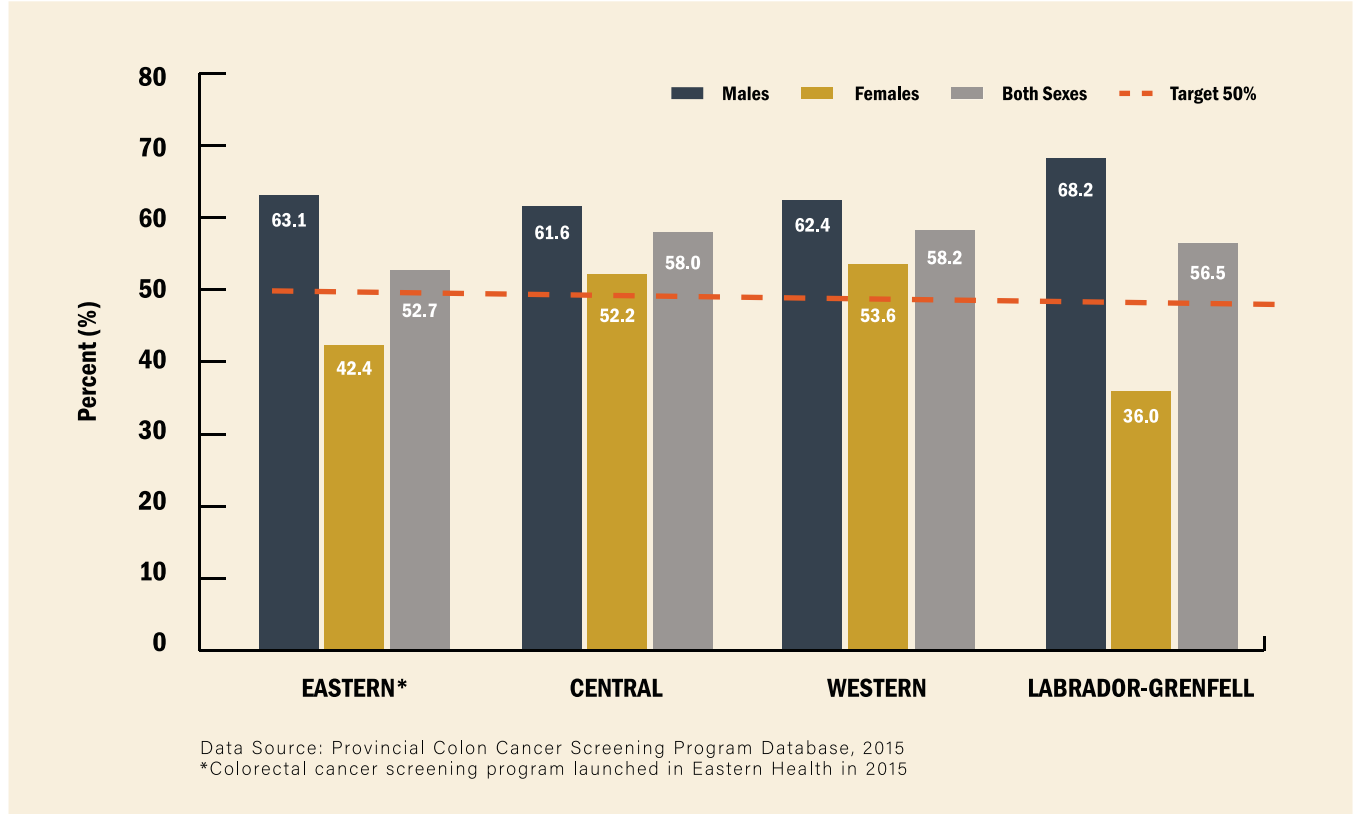
3.0 PERSON-CENTERED PERSPECTIVE

Person-centered care is a way of thinking and doing things that sees the individuals using health and social services as equal partners in planning, developing and monitoring care to make sure it meets their needs.

This means putting people and their families at the centre of decision making and seeing them as experts, working alongside professionals to achieve the best outcome[9].

Person-centered care is not just about giving people whatever they want or providing information. It is about considering people's desires, values, family situations, social circumstances and lifestyles; seeing the person as an individual, and working together to develop appropriate solutions[10,11,12].
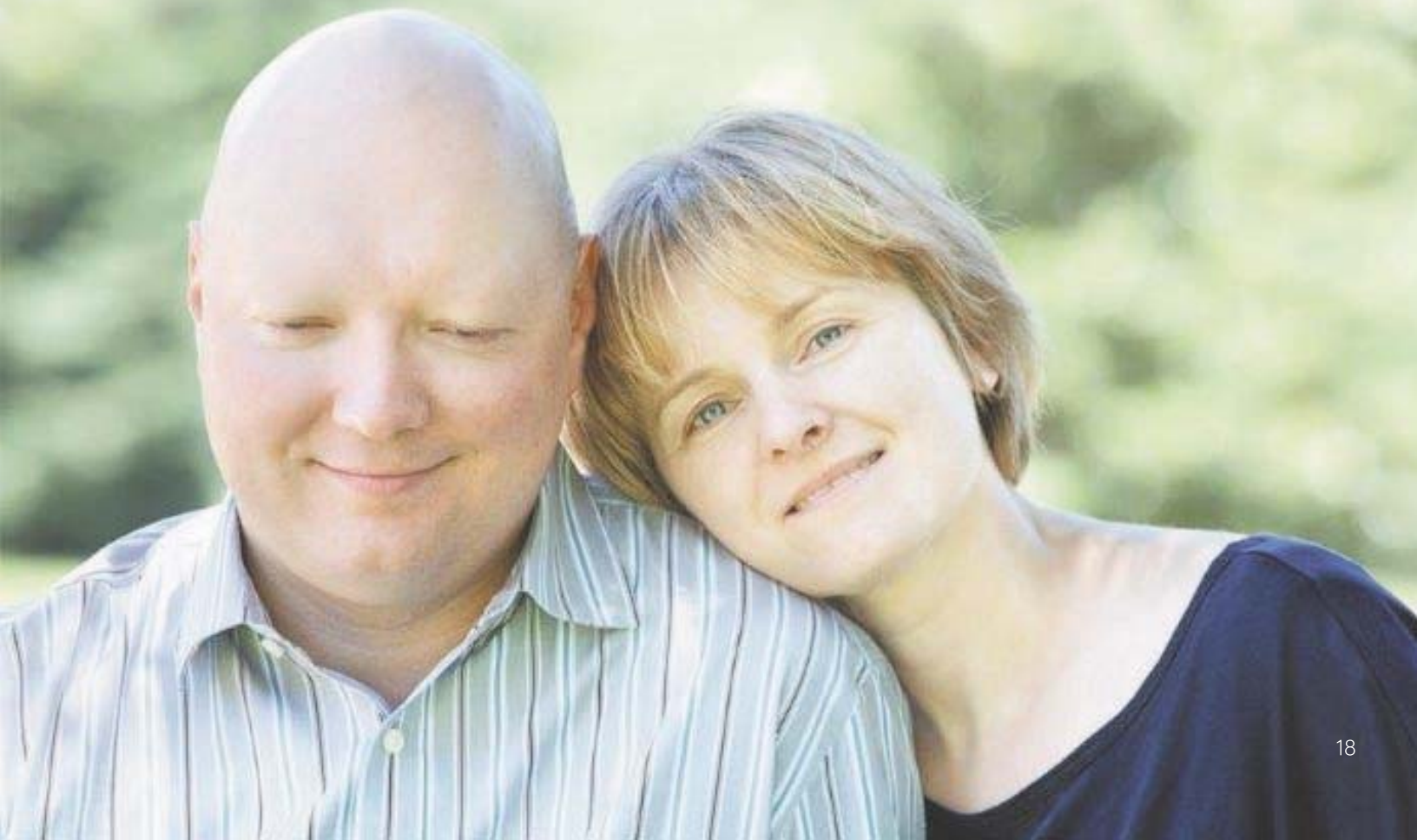
Screening for Distress: Patient-reported outcomes (PROs) are reports coming directly from patients about how they feel or function in relation to a health condition and its therapy without interpretation by healthcare professionals or anyone else.

Capturing PROs is an essential component of delivering person-centered care and plays an integral role in gaining a better understanding of the patient experience. Person-centered care is still an emerging area of understanding but there are standardized tools currently in use in various jurisdictions that capture elements of the cancer patient experience. This is important because research has shown that 35% to 40% of cancer patients feel that they would benefit from professional support services[13]. Distress among those diagnosed with cancer can range along a spectrum from normal feelings of fear, anxiety and sadness to issues that can become disabling. There are negative outcomes associated with heightened distress including poorer treatment adherence, decreased satisfaction with care and compromised quality of life. Routine screening for distress is an evidence-based practice referred to as the 6th vital sign[14].

Screening for distress can help to identify problems early in the disease trajectory so that the appropriate measures can be taken to address a patient's needs and reduce their symptom burden.

The tools used the NL Provincial Cancer Care Program include the ESAS-r and the Canadian Problem Checklist (CPC)[15].

The ESAS-r is a valid and reliable tool that assists in the assessment of nine common symptoms experienced by cancer patients including:

**Pain
Tiredness
Nausea
Depression
Anxiety
Drowsiness
Appetite
Well-Being
Shortness of Breath**

Severity of each symptom is rated on scale of 0 to 10, where 0 represents that the symptom is absent and 10 represents the worst possible severity. The CPC is an adjunct to the ESAS-r and is a checklist outlining a number of issues related to emotional, practical, spiritual, social, informational and physical concerns. The screening for distress initiative was launched in the Cancer Care Program in January, 2015. Screening was initiated first with patients who were new to the cancer centre and was then expanded to patients receiving treatment and attending follow-up appointments. Ultimately, the screening process was implemented in several sites across the province.

FIGURE 3.1 EDMONTON SYMPTOM ASSESSMENT SYSTEM AND CANADIAN PROBLEM CHECKLIST

As described previously, the higher the number selected on the ESAS-r corresponding to each symptom, the more severe the experience of the symptom. The scoring system assigns a '0' score to the absence of a symptom, 1-3 indicates low symptom burden, 4-6 indicates moderate symptom burden and 7-10 indicates severe symptom burden. Between January 2015 and September 2016, a total of 3672 ESAS-r questionnaires were administered to 3174 patients; patients can complete a questionnaire at multiple points in their care trajectory. Approximately equal proportions of men and women completed one or more questionnaires, 45% vs. 55%.

For most symptoms, the majority of respondents chose the "0" response for all symptoms, indicating that the symptom was not causing them distress at the time of questionnaire completion. Issues with nausea and appetite caused the least amount of distress with respectively only 17% and 25% of patients reporting distress associated with these symptoms. Pain, drowsiness, shortness of breath and depression were reported as causing distress in 30%-40% of respondents. Tiredness, anxiety and well-being were the three symptoms most likely to cause some level of distress in that 53%, 45% and 56% of patients respectively indicated experiencing

PATIENTS REPORTED HAVING
DISTRESS
ASSOCIATED WITH THESE SYMPTOMS:

NAUSEA
17%

LOSS OF APPETITE
25%

SHORTNESS OF BREATH
30-40%

TIREDNESS
53%

PAIN
30-40%

DEPRESSION
30-40%

DROWSINESS
30-40%

ANXIETY
45%

WELL-BEING
56%

distress associated with these symptoms.

For all ESAS-r symptoms, the proportion of respondents reporting symptom burden decreased as severity increased. This is reassuring in that there appears to be a relatively small number of patients who are experiencing severe distress with any symptom.

Conducting the ESAS-r has allowed for identification of patient issues both on the individual level and on the population level. The latter will support priority setting and quality improvement initiatives for the Cancer Care Program.

Surveying patients at repeated intervals will enable patients to identify new issues as they arise and will allow the program to track changes in the experience of symptoms over time, with a goal of symptom reduction for patients. Table 3.1 highlights the response choices of patients for each symptom listed on the ESAS-r. It can be seen from this table that the percentage of respondents decreases as reported symptom burden or distress increases in severity.

Ambulatory Oncology Patient Satisfaction Survey
The Ambulatory Oncology Patient Satisfaction Survey (AOPSS) was developed and validated by the National Research Corporation (NRC) to assess the overall experiences of cancer patients, and to provide

TABLE 3.1 PATIENT-REPORTED SEVERITY OF DISTRESS USING THE ESAS-R

SYMPTOMS	LEVEL OF DISTRESS:	None (0)	Mild (1-3)	Moderate (4-6)	Severe (7-10)
	NAUSEA	83%	11%	4%	2%
	PAIN	65%	18%	10%	7%
	TIREDNESS	47%	22%	18%	13%
	APPETITE	75%	11%	7%	6%
	DROWSINESS	62%	20%	11%	7%
	SHORTNESS OF BREATH	70%	15%	9%	6%
	DEPRESSION	68%	16%	12%	4%
	ANXIETY	55%	22%	13%	10%
	WELL-BEING	45%	25%	20%	10%

evidence-based recommendations that can help to improve the provision of patient- and family-centered care[16]. The AOPSS includes questions about cancer diagnosis, treatment, symptom management, health, and overall experiences of care.

The survey questions are coded within six broad dimensions of care:

Physical Comfort
Information & Education
Emotional Support
Respect for Preferences
Access to Care; and
Coordination of Care

In order to be eligible to participate in the AOPSS survey the following inclusion criteria had to be met:

- Patient has a confirmed diagnosis of cancer;
- Patient has received active cancer treatment in an ambulatory setting in the past 6 months (surgery, chemotherapy, radiation); and
- Patient is 18 years or older

In September of 2016, surveys were sent out to 1092 cancer patients who had received some form of active treatment within the prior six months. This sample size was based on an assumed response rate of 40%. Furthermore, the sample was stratified to ensure that patients residing in all four RHAs were targeted proportional to the total population residing within each RHA. This was done to avoid over-repre-

sentation in the sample by the largest RHA, Eastern Health. A response rate of 49.5% was obtained which exceeded the expected rate. Table 3.2 demonstrates the percentage of respondents by RHA of residence compared with the percentage of the total provincial population living in each RHA. Proportions of respondents in each RHA are generally reflective of the total proportion of the NL population living in each region, indicating that each region was represented adequately.

An equal number of men and women (n=267 each) completed the survey. Most respondents (56.2%) were 65 years of age or older. The highest level of education most commonly completed was college, trade or technical school (28.5%) and almost 80% of respondents completed the survey by them-

TABLE 3.2 SURVEY RESPONSES BY RHA COMPARED WITH PROPORTION OF PROVINCIAL POPULATION BY RHA

LEGEND:

Survey Response %, (n)

% Proportion of Provincial Population

LABRADOR
6.0 (32)
% 7.1 PERCENT

CENTRAL
21.7 (116)
% 18.2 PERCENT

WESTERN
15.5 (83)
% 15.2 PERCENT

EASTERN
56.7 (303)
% 60 PERCENT
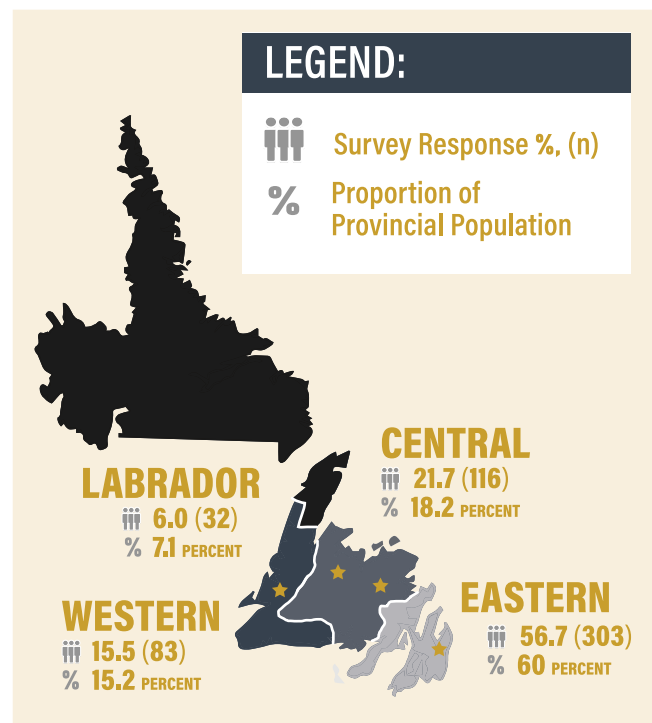
selves. The most common cancers reported by respondents were breast, lung, prostate and colorectal (Table 3.3) and for most patients, this was their first cancer diagnosis (66.4%).

Figures 3.2 to 3.4 illustrate some of the key results from the 96-item AOPSS that best elucidate the patient experience and / or allow for comparisons with national results. Highlighted are questions on the experience of receiving a cancer diagnosis, an overall rating of care received and whether the patient would recommend the health care providers at the Cancer Care Program to their family and friends.

TABLE 3.3 CANCER DIAGNOSES OF RESPONDENTS

BRAIN 1.9%

HEAD & NECK 2.6%

MELANOMA/ SARCOMA 1.5%

LUNG 15%

BREAST 17.7%

OTHER 6.9%

STOMACH 1.9%

KIDNEY/ BLADDER 1.0%

PROSTATE/ TESTICULAR 14%

COLORECTAL/ BOWEL 13.1%

CERVIX/ UTERINE/ OVARIAN 4.9%

MISSING/ DON'T KNOW 17.4%

HEMATOLOGY/ LYMPHOMA 2.1%
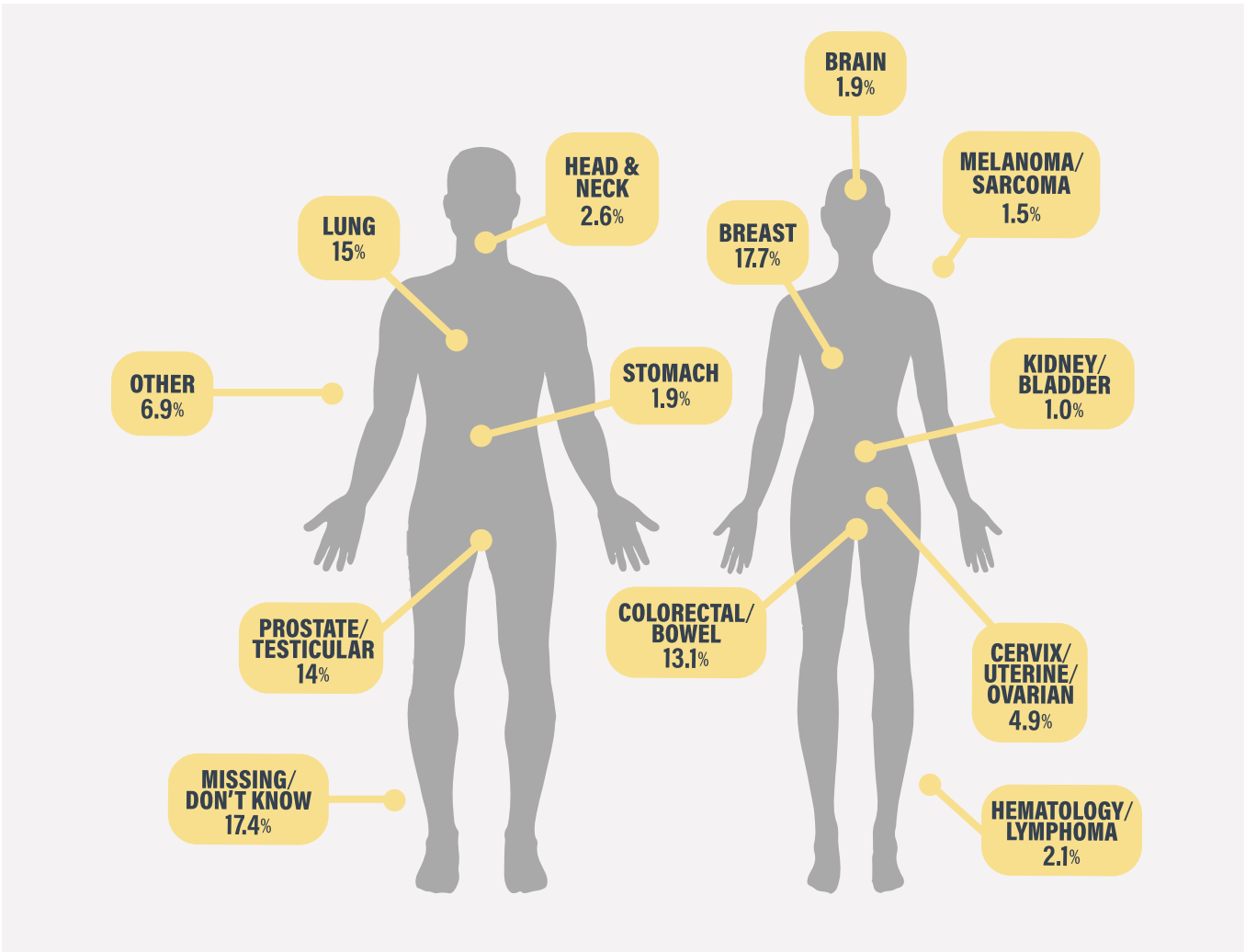
The Latter Two Questions:
OVERALL RATING &
WOULD YOU RECOMMEND

are considered to be the two overarching questions or concepts on the AOPSS and are informed by the six dimensions of care.

Three-quarters of patients felt that they were told of their diagnosis in a sensitive manner, while an additional 21.9% felt they were told in a 'somewhat sensitive' manner. Only 2.9% of patients experienced a cancer diagnosis that was not at all delivered sensitively (Figure 3.2).

75% of patients felt they were told their diagnosis in a SENSITIVE manner.

21.9% felt that they were told in a SOMEWHAT SENSITIVE manner.

2.9% felt that they were told in a NOT AT ALL SENSITIVE manner.
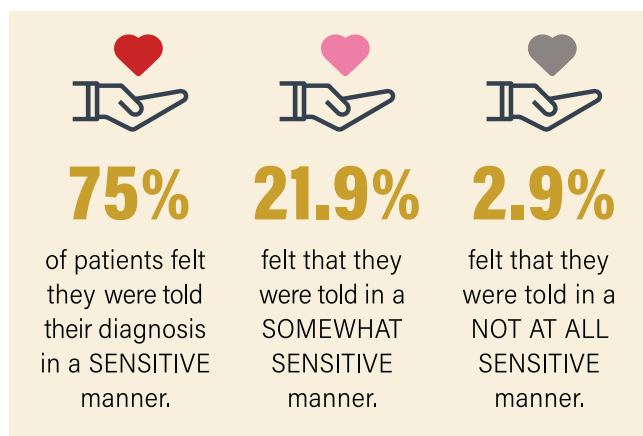
The overall rating of care received in the past six months was very positive with, cumulatively, 90% of patients rating their care as 'Excellent' (62.8%) or 'Very Good' (26.6%). Similarly, 92% of patients agreed that they would recommend the health care providers at the Cancer Care Program to family and friends. An additional 7.3% agreed 'somewhat' for a total of 99.3%.

EXCELLENT (62.8%)

VERY GOOD (26.6%)

GOOD (8.2%)

FAIR (1.7%)

POOR (0.6%)
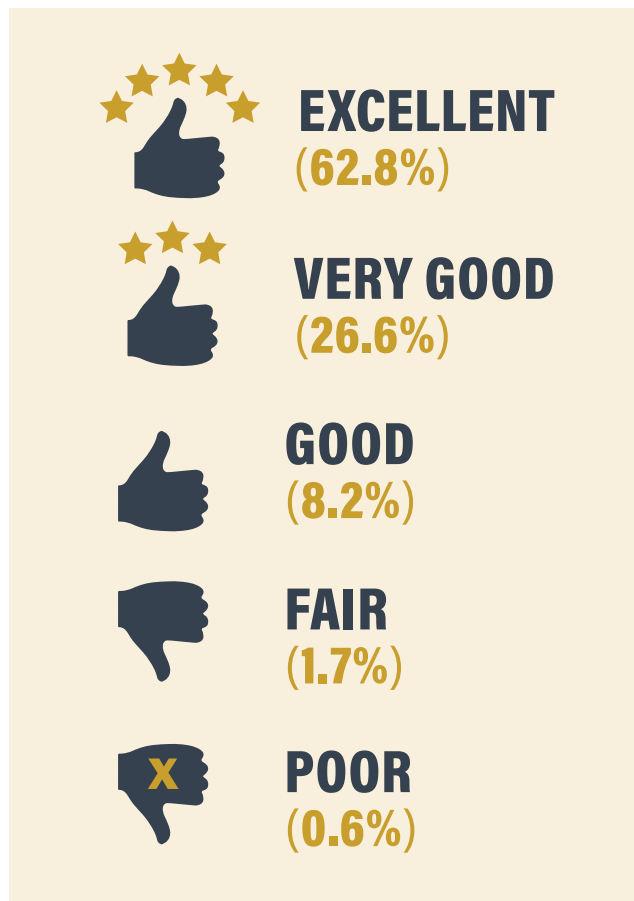
Table 3.4 displays the six dimensions of care, the national benchmark scores for each of these dimensions along with provincial scores and an indication of whether or not there is a significant difference between the national and provincial results.

92% Yes, **completely**

7.3% Yes, **somewhat**

0.6% No
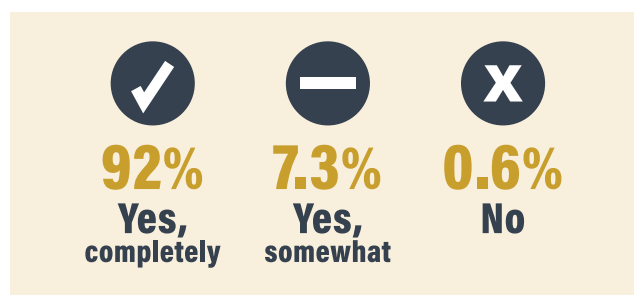
Patients in NL rated their experience of care in the **Physical Comfort**; **Access to Care**; and **Coordination and Integration of Care** dimensions significantly better than the national benchmark. There was no significant difference between national results and provincial results for **Information, Education and Communication**; **Respect for Patient Preferences**; or **Emotional Support**. On no dimension did NL patients rate their experience of care as significantly lower than the benchmark score, which is encouraging. However, it can be seen from the provincial scores that there are varying degrees of room for improvement on the six dimensions. This is particularly so for **Emotional Support** which received the lowest percentage of positive ratings.

TABLE 3.4 PROVINCIAL AND PRIMARY BENCHMARK SCORES ON SIX DIMENSIONS OF THE AOPSS

DIMENSION	BENCHMARK % (n size)	NL SCORE % (n size)	SIGNIFICANTLY DIFFERENT
Physical Comfort	77.5%, (3,751)	83.7%, (210)	▲
Information, Education, Communication	65.9%, (7,418)	69.0%, (465)	=
Respect for Patient Preferences	80.6%, (7,565)	81.2%, (481)	=
Access to Care	69.2%, (5,148)	74.4%, (342)	▲
Coordination and Integraion of Care	69.9%, (7,462)	73.6%, (468)	▲
Emotional Support	53.2%, (6,387)	52.1%, (410)	=

▲   NL score is significant higher than national benchmark
=   No significant difference between provincial score and national benchmark

Comparisons by Regional Health Authority
Responses to several AOPSS questions were compared across RHAs to explore whether there were any regional differences in the experience of ambulatory cancer care that could be identified. To begin, the three primary treatment modalities for cancer were compared; surgery, chemotherapy (IV and oral) and radiation therapy. The percentage of patients having surgery as part of their active treatment in the past six months ranged from 53.3% in Labrador-Grenfell Health to 62% in Central Health. Although this represents a 10 percentage point difference in the proportion of patients that underwent surgery, a similar proportion of patients underwent surgery in Eastern Health as in Labrador-Grenfell Health

which implies that the Labrador-Grenfell Health number might not be due to an access or availability reason. The smallest proportion of patients to receive oral and IV chemotherapy were in Eastern Health but the range in values across RHAs was relatively small.

Finally, a notable difference in the percentage of patients who reported receiving radiation therapy was seen between Labrador-Grenfell Health and all other RHAs. This may imply an access issue or that some patients opt not to have radiation therapy due to the associated travel.

TABLE 3.5 CANCER TREATMENT TYPE BY RHA

TREATMENT TYPE:
✎ Surgery   🔲 IV Chemotherapy
🔴 Oral Chemotherapy   ☢ Radiation Therapy

LABRADOR
✎ 53.3%   🔲 51.7%
🔴 35.7%   ☢ 32.1%

CENTRAL
✎ 62%   🔲 55.8%
🔴 39.4%   ☢ 49%

WESTERN
✎ 60.3%   🔲 54.8%
🔴 33.8%   ☢ 47.3%

EASTERN
✎ 55%   🔲 51.2%
🔴 31.9%   ☢ 44%
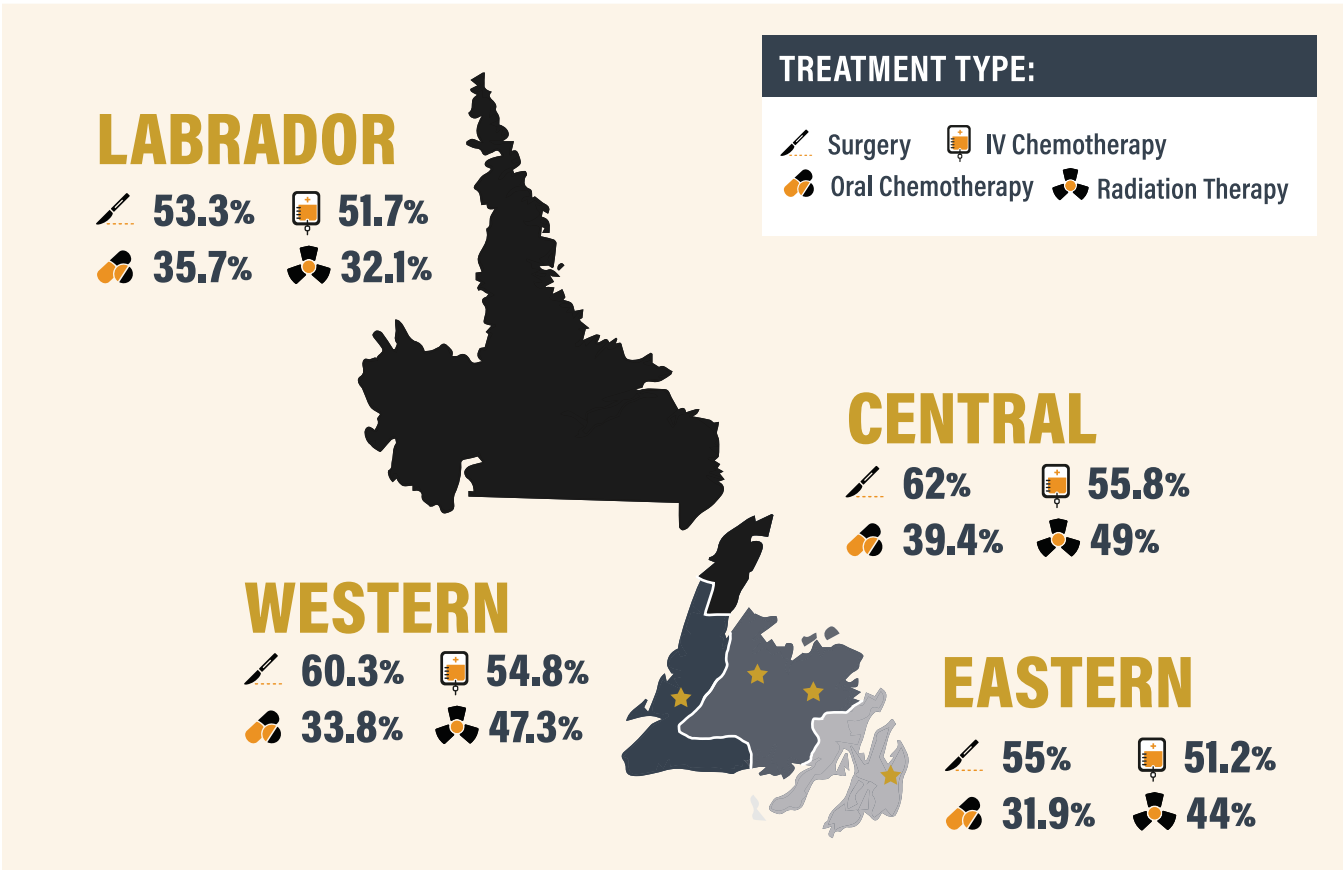
Respondents were also asked if they had to travel for any tests or treatments and, if so, whether their care providers considered their travel concerns when planning treatment. Table 3.6 illustrates the responses to this question broken down by RHA. Unsurprisingly, the largest proportion of patients indicating that they did not have to travel to receive treatment were residing in the Eastern Health region. Eastern Health includes the capital city of St. John's, in which a large proportion of the provincial population is clustered and which is home to tertiary care facilities, the main cancer centre and the only site where radiation therapy is delivered. A much smaller proportion of patients from all other RHAs indicated that they did **not** have to travel to receive care. The percentages presented in the final three columns of Table 3.6 indicate the percentage of people choosing each response out of the total number of patients who reported having to travel in each RHA, not the total number of patients surveyed in each region, i.e. the 'no' responses were removed from the denominator.

Patients living in the Central region were most likely to feel as though health providers completely considered their travel concerns in treatment planning (76%), whereas, only half the respondents from Labrador-Grenfell thought the travel concerns were completely taken into account.

Patients residing in Labrador-Grenfell could conceivably have the farthest distance, to travel, particularly if radiation therapy was required. Relatively small numbers of patients felt that travel concerns were not considered at all and between 14.6% (Central) and 35.7% (Labrador) felt that they were somewhat considered.

TABLE 3.6 TRAVEL CONCERNS WERE CONSIDERED IN TREATMENT PLANNING

	EASTERN	CENTRAL	WESTERN	LABRADOR
TRAVEL Not Required	40.4%	4%	6.6%	3.4%
YES Completely	62%	76%	56.3%	50%
YES Somewhat	28.4%	14.6%	29.6%	35.7%
NO	9.5%	9.4%	14.1%	1.4%

Patients who received IV chemotherapy were asked where they received most of their treatment. It can be seen from the responses in Table 3.7 that patients were able to receive treatment closer to home some of the time. The Cancer Care Program has four centres located in St. John's, Eastern Health RHA; Western Regional Cancer Centre (Corner Brook) located in the Western RHA; Central East Regional Cancer Centre (Gander) and Central West Regional Cancer Centre (Grand-Falls Windsor), both located in the Central RHA. Those selecting the 'Other' category are likely referring to receiving treatment at one of the peripheral clinics that

TABLE 3.7 LOCATION WHERE MAJORITY OF IV CHEMOTHERAPY WAS ADMINISTERED

RHA	LOCATION OF TREATMENT				
	Dr. H. Bliss Murphy Cancer Centre St. John's	Cancer Centre Grand Falls-Windsor	Cancer Centre Gander	Cancer Centre Corner Brook	Other
EASTERN	79.5%	0%	0%	0%	20.5%
CENTRAL	12.2%	44.9%	36.7%	2%	4.1%
WESTERN	15.8%	2.6%	0%	57.9%	23.7%
LABRADOR-GRENFELL	6.7%	0%	0%	0%	93.3%

deliver chemotherapy and which are located throughout the province. As mentioned previously, radiation therapy is delivered at one site in the province, so the analogous question for radiation was not relevant for patients in NL.

Figure 3.5 shows the patient-reported wait time for chemotherapy by fifteen-minute intervals for all patients receiving IV chemotherapy. Patients were asked, 'how long did you usually have to wait in the waiting room from your scheduled appointment until your IV chemotherapy treatment'. Regardless of where treatment was received, it appeared that most patients did not experience unacceptably long wait times to receive their treatment. Approximately half of patients waited less than 15 minutes to start and, cumulatively, 73.8% of patients waited a half

FIGURE 3.5 PATIENT-REPORTED WAIT TIME TO START CHEMOTHERAPY

Percent

15 min. or less	16-30 min.	31-45 min.	46-90 min.	More than 60 min.
50.6%	23.2%	10.7%	8.2%	7.3%

Wait before chemotherapy treatment
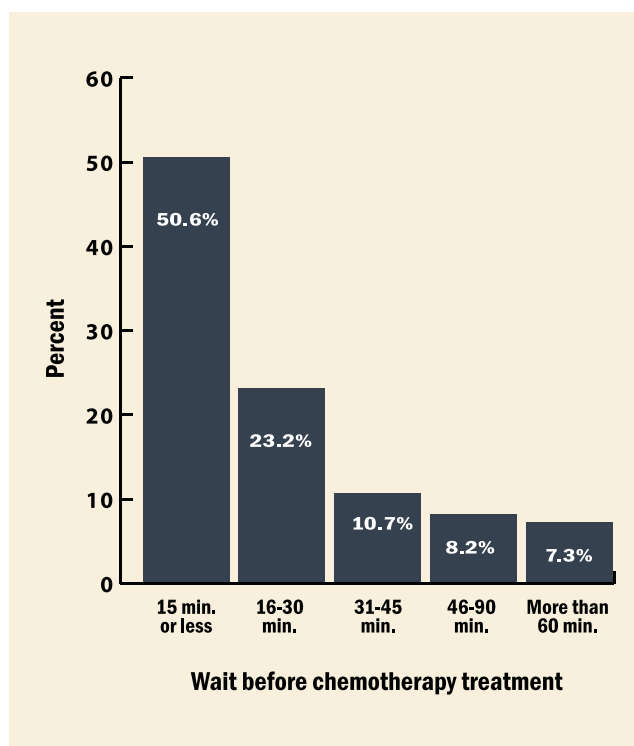
hour or less. However, a quarter of patients (26.2%) reported waiting a half hour or more to start treatment.

Radiation wait times, as reported by patients are shown in Figure 3.6. Wait time to start radiation therapy was very short with over 75% of patients waiting 15 minutes or less to start and, cumulatively, 97.8% waiting less than half an hour. Only 1.5 % reported having to wait 31 to 45 minutes. No patient reported a longer wait time than this.

In addition to treatment-related experiences, the AOPSS also asks patients about other types of informational needs and whether they were met. Table 3.7 provides an overview of these responses by RHA.

FIGURE 3.6 PATIENT-REPORTED WAIT TIME TO START RADIATION THERAPY
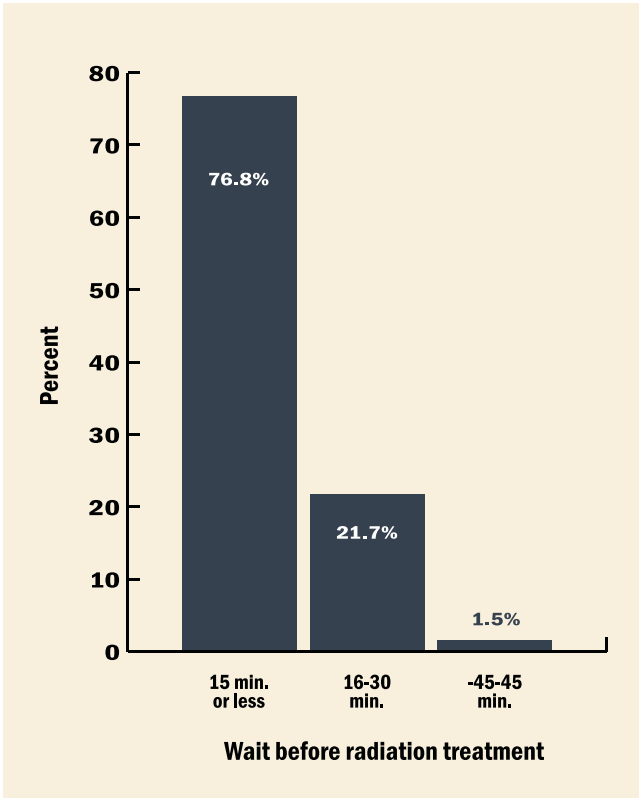
In general, it can be seen that **patients in Labrador-Grenfell were less likely to have their informational needs met**, as within all categories they gave the highest proportion of 'no' responses among all RHAs. For most topics, patients in Western Health were the most likely to report having received adequate information.

However, for all RHAs there were substantial proportions who chose the 'yes somewhat' category, implying that informational needs of patients could be better addressed.

The lowest number of respondents chose the 'no' category, nonetheless there were some topics where close to 20% or greater of respondents indicated that they didn't get enough information. This was more likely to be seen in areas such as emotional changes, sexual activity and relationships. **Thus, the emotional and social challenges associated with cancer appear to be less well addressed than the physical and medical challenges.**

Awareness of these information gaps provides a starting point for enhancing and tailoring patient communication and information products.

TABLE 3.8 INFORMATIONAL NEEDS OF PATIENTS

Q: Did you get enough information about possible changes to your emotions?

RHA	Doesn't Apply	Yes, Completely	Yes, Somewhat	No
EASTERN	18.4%	31.8%	31.0%	18.8%
CENTRAL	20.2%	36.4%	24.2%	19.2%
WESTERN	11.1%	54.2%	15.3%	19.4%
LAB-GRENFELL	10.3%	24.1%	34.5%	31.0%

Q: Did you get enough information about your nutritional needs?

RHA	Doesn't Apply	Yes, Completely	Yes, Somewhat	No
EASTERN	15.6%	47.9%	25.5%	11.0%
CENTRAL	8.1%	56.6%	21.2%	14.1%
WESTERN	4.1%	60.8%	23.0%	12.2%
LAB-GRENFELL	13.8%	24.1%	31.0%	31.0%

Q: Did you get enough information about possible changes in your physical appearance?

RHA	Doesn't Apply	Yes, Completely	Yes, Somewhat	No
EASTERN	18.5%	54.8%	20.1%	6.6%
CENTRAL	16.7%	61.5%	13.5%	8.3%
WESTERN	16.4%	65.8%	12.3%	5.5%
LAB-GRENFELL	14.8%	37.0%	29.6%	18.5%

Q: Did you get enough information about possible changes in your sexual activity?

RHA	Doesn't Apply	Yes, Completely	Yes, Somewhat	No
EASTERN	30.0%	30.0%	20.0%	20.0%
CENTRAL	24.7	36.1%	15.5%	23.7%
WESTERN	21.9%	45.2%	17.8%	15.1%
LAB-GRENFELL	13.8%	34.5%	17.2%	34.5%

Q: Did you get enough information about possible changes in your relationship with your spouse or partner?

RHA	Doesn't Apply	Yes, Completely	Yes, Somewhat	No
EASTERN	32.2%	20.7%	17.2%	29.9%
CENTRAL	27.4%	28.4%	16.8%	27.4%
WESTERN	33.3%	24.0%	14.7%	28.0%
LAB-GRENFELL	17.2%	20.7%	24.1%	37.9%

Q: Did you get enough information about possible changes in your work or usual activities?

RHA	Doesn't Apply	Yes, Completely	Yes, Somewhat	No
EASTERN	26.4%	35.6%	25.3%	12.6%
CENTRAL	24.5%	43.9%	22.4%	9.2%
WESTERN	23.0%	47.3%	20.3%	9.5%
LAB-GRENFELL	10.3%	37.9%	17.2%	34.5%

Q: Did you get enough information about possible changes in your energy/ fatigue level?

RHA	Doesn't Apply	Yes, Completely	Yes, Somewhat	No
EASTERN	7.5%	53.6%	31.3%	7.5%
CENTRAL	4.0%	60.0%	26.0%	10.0%
WESTERN	4.1%	67.6%	17.6%	10.8%
LAB-GRENFELL	6.9%	48.3%	13.8%	31.0%

4.0 LONG-TERM OUTCOMES

Long-term outcomes address key elements of cancer burden including incidence, mortality and survival. Much of the work in cancer control is aimed at improving long-term outcomes. Incidence, mortality and survival rates are presented for all cancers and for the four most common cancer sites. Incidence, mortality and survival trends over time are presented for varying intervals depending on available data.

Incidence

All Cancers: The age-standardized inci-dence rate (ASIR) represents the number of newly diagnosed cancer cases per 100,000 people that would occur in a particular area/ jurisdiction if it had the same age distribution as a standard reference population.

In this case, the reference population is the 2011 Canadian population.

Figure 4.1 shows the ASIR for all types of cancer collectively for the combined years of 2013-2015. The ASIR was higher for males than in females in the combined years of 2013-2015. The provincial ASIR for all types of cancers was 593.71 cases per 100,000 for men and 515.38 cases per 100,000 for women. Male ASIRs ranged from 545.15 in the Labra-dor-Grenfell Health Region to 614.12 in Eastern Health. Female ASIRs ranged from 426.64 in Labrador-Grenfell Health Region to 529.89 cases per 100,000 females in Eastern Health.

FIGURE 4.1 INCIDENCE RATES FOR ALL TYPES OF CANCERS, BY SEX AND RHA, AGE-STANDARDIZED TO THE 2011 POPULATION, 2013-2015 COMBINED
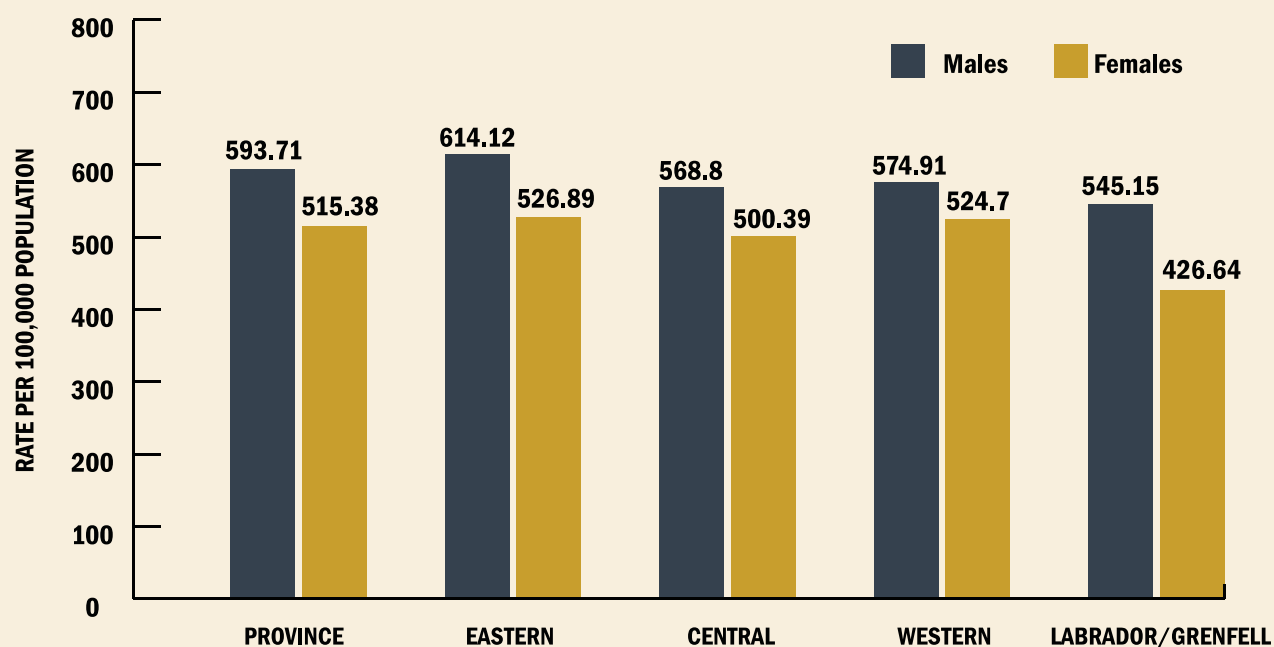
Data Source: Canadian Cancer Registry NL submission file (2013-2015); NLCHI population file (2013-2015)

FIGURE 4.2 INCIDENCE RATES FOR ALL TYPES OF CANCERS, BY SEX, NL, AGE-STANDARDIZED TO THE 2011 POPULATION,NL, 2006-2015
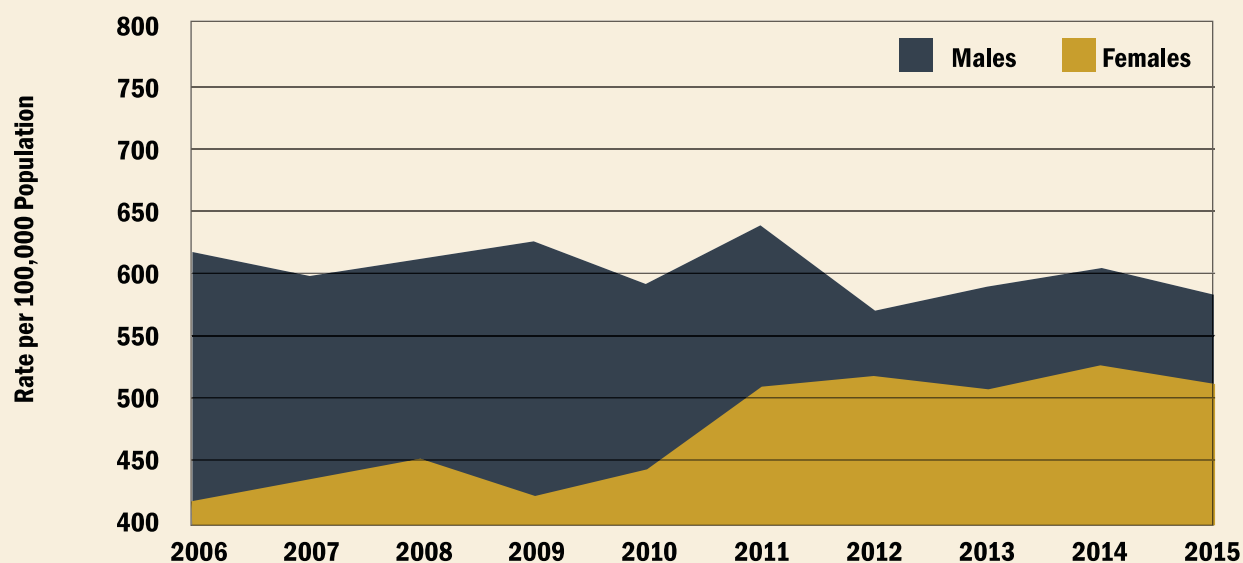
Data Source: Canadian Cancer Registry NL submission file (2006-2015); NLCHI population file (2006-2015)

Figure 4.2 depicts the trend for provincial ASIRs for all cancers collectively over a nine year period (2006-2015). The incidence rate for males slightly decreased from 616.42 cases to 582.30 cases per 100,000 with fluctuations in 2009 and 2011 (overall relative change= -5.54%); whereas the provincial ASIR for females increased significantly from 418.14 to 515.55 cases per 100,000 females (overall relative change = 23.30%). Some of this increase is likely explained by the considerable increase seen in thyroid cancer diagnoses and improved case ascertainment for breast cancers.

Four Most Common Cancers

For the combined years of 2013 to 2015, prostate cancer was the most common cancer in males in the province with an ASIR of 133.36 cases per 100,000 and breast cancer was the most common cancer in females in the province with an ASIR of 142.87 cases per 100,000 (Figure 4.3). The ASIRs for CRC and lung cancer were lower in females than in males. Compared to the Canadian incidence rates in 2012 for these four commonly diagnosed cancers (Figure 4.4), provincial rates were higher in both males and females.

FIGURE 4.3 INCIDENCE RATES FOR FOUR COMMON CANCERS, BY SEX, NL, AGE-STANDARDIZED TO THE 2011 POPULATION, 2013-2015 COMBINED

NEWFOUNDLAND	
PROSTATE 133.36	**BREAST** 142.87
COLORECTAL 113.01	**COLORECTAL** 78.33
LUNG 93.68	**LUNG** 62.61
MALE	FEMALE

FIGURE 4.4 INCIDENCE RATES FOR FOUR COMMON CANCERS, BY SEX, CANADA, AGE-STANDARDIZED TO THE 2011 POPULATION, 2012

CANADA	
PROSTATE 126.80	**BREAST** 125.60
COLORECTAL 73.10	**COLORECTAL** 51.60
LUNG 79.30	**LUNG** 61.30
MALE	FEMALE

Data Source: Canadian Cancer Registry NL submission file (2013-2015); NLCHI population file (2013-2015)

Data Source: The 2016 Cancer System Performance Report, CPAC
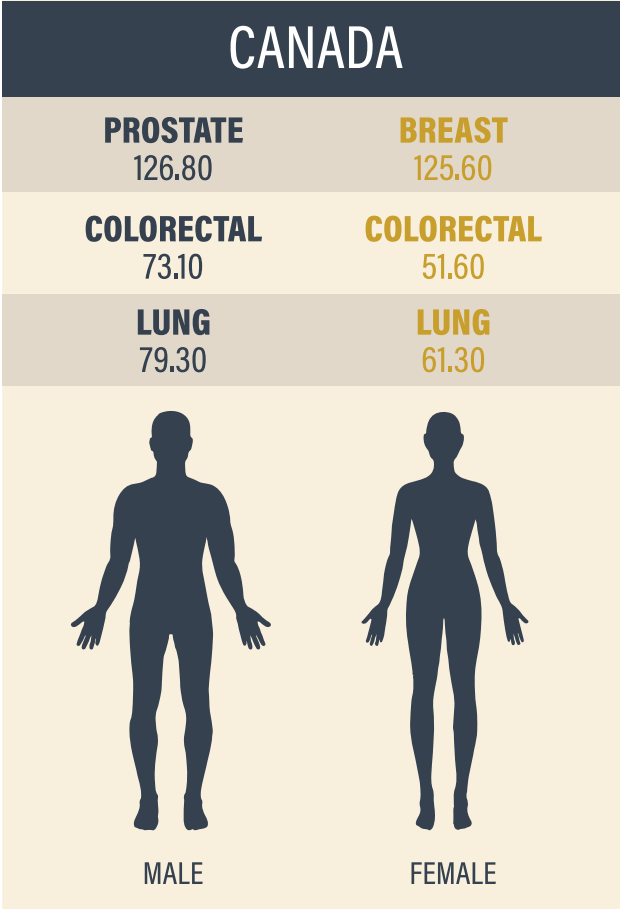
Data Source: The 2015 Cancer System Performance Report, CPAC
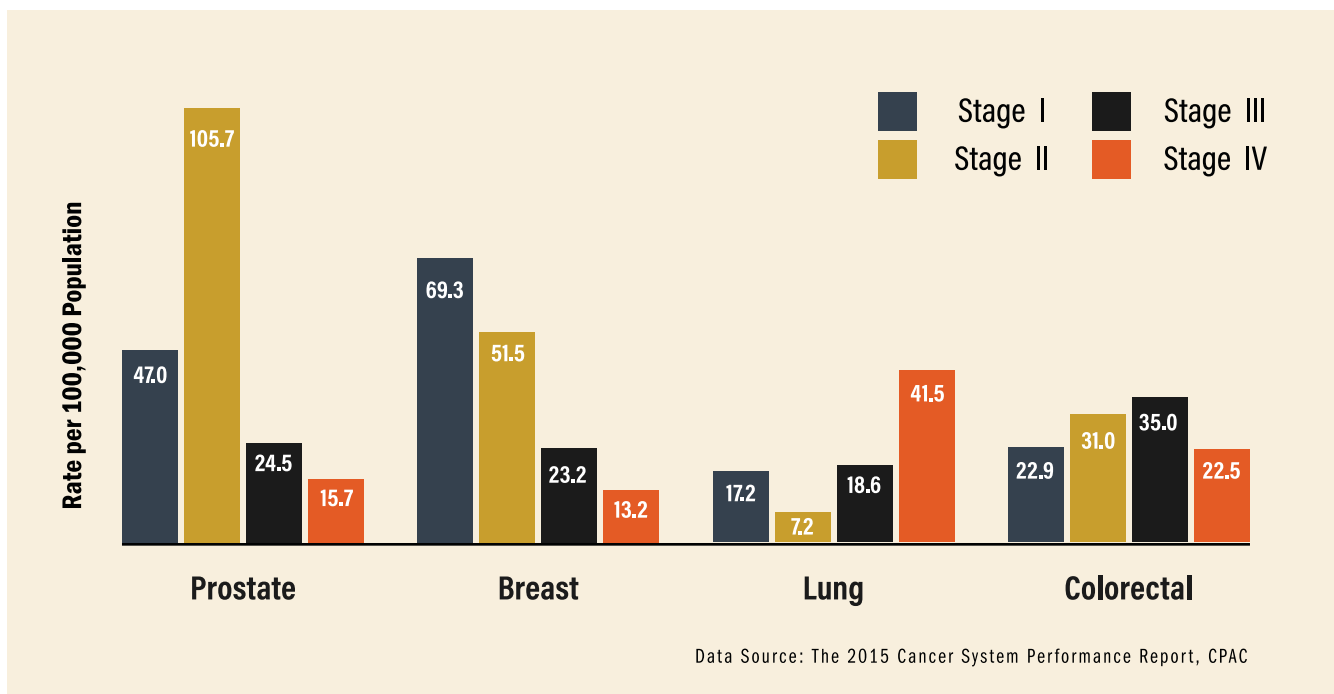
Figure 4.5 shows the provincial stage-specific ASIRs for the combined years of 2010 to 2012 for the four most common cancers. More patients were diagnosed at early stages for prostate and breast cancers.

The majority of prostate cancers were diagnosed at stage II and breast cancer was most frequently diagnosed at stage I. In contrast, most lung cancer patients were diagnosed at stage IV and the most frequent stage at diagnosis for CRC patients was stage III, followed by stage II.

Four Most Common Cancers by RHA

Breast: For the combined years of 2013 to 2015, incidence rates for female breast cancer ranged from 120.59 cases per 100,000 in Labrador-Grenfell Health to 160.33 cases per 100,000 in Western Health (Figure 4.6). ASIRs for breast cancer were higher in Eastern, Central, and Western Health for the reported time period than the Canadian ASIR for breast cancer in 2012. Figure 4.7 demonstrates that the provincial ASIR for female breast cancer increased significantly from 108.72 cases per 100,000 in 2006 to 155.62 cases per 100,000 females in 2015 (overall relative change = 43.14%).

Data Source: Canadian Cancer Registry NL submission file (2013-2015); Statistics Canada population file (2013-2015); CPAC 2016 report *2012 Canadian ASIR for Breast Cancer, age-standardized to 2011 population for comparison purposes.
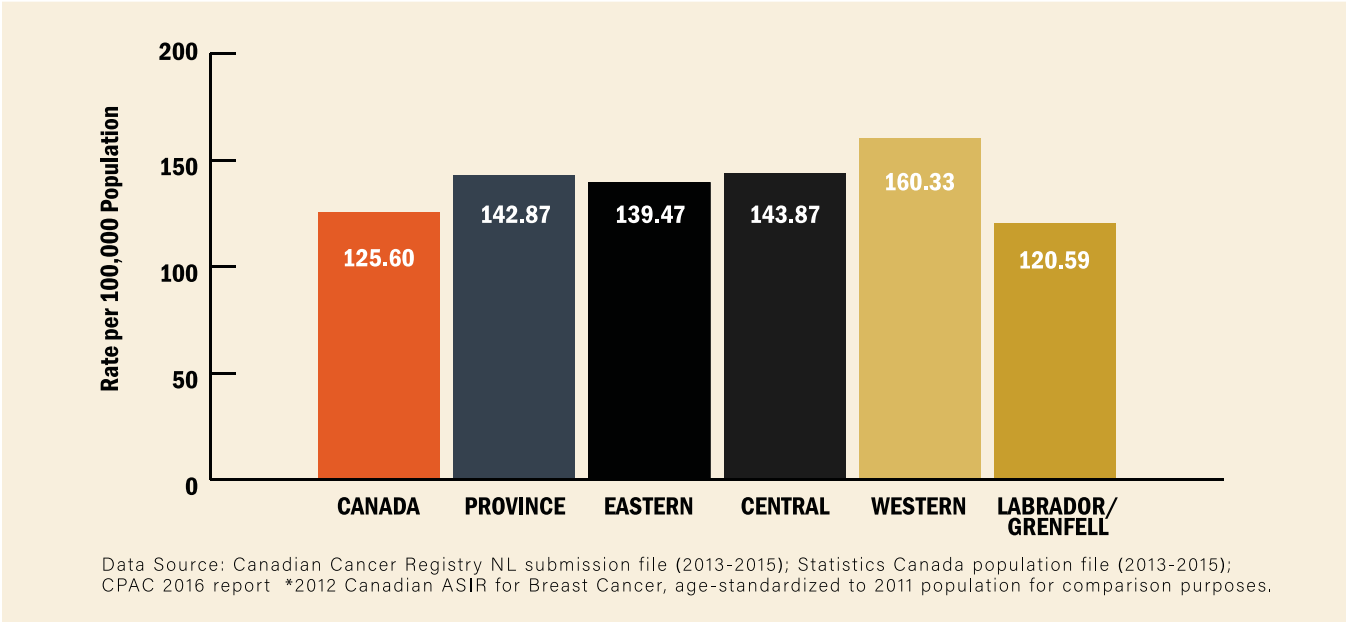
Data Source: Canadian Cancer Registry NL submission file (2006-2015); NLCHI population file (2006-2015)
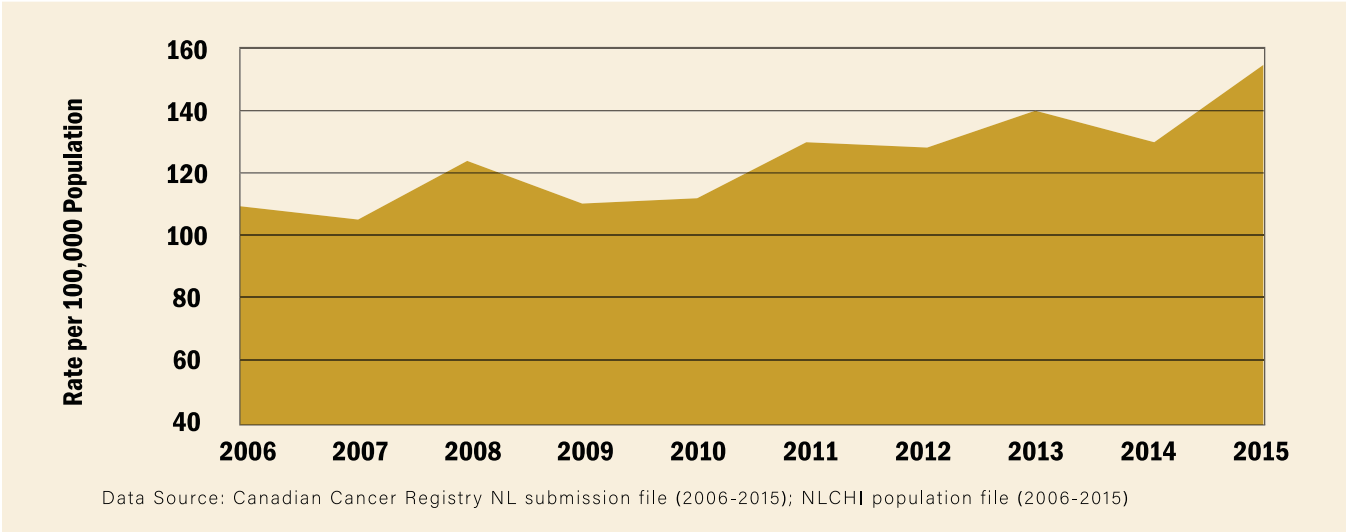
Colorectal: The ASIR of CRC was higher in males than females in each of the RHAs (Figure 4.8). The ASIR was lowest in Labrador-Grenfell for both men and women and the ASIR was highest in Central for men and in Eastern for women. The ASIR of CRC was higher for all of the RHAs than for Canada overall. As shown in Figure 4.9, the incidence rate over time was relatively steady for men, ranging from 119.64 in 2006 to 117.88 in 2015 with some fluctuation (overall relative change = -1.47%). The ASIR trend for women was similar. The lowest ASIR was 65.99 in 2009 and the highest was 83.23 in 2014 (overall relative change = -4.31%).

FIGURE 4.8 INCIDENCE RATES FOR COLORECTAL CANCER, BY SEX AND RHA, AGE-STANDARDIZED TO THE 2011 POPULATION, 2013-2015 COMBINED

Data Source: Canadian Cancer Registry NL submission file (2013-2015); NLCHI population file (2013-2015); The 2016 Cancer System Performance Report, CPAC
*2012 Candian ASIR for colorectal cancer, age-standardized to 2011 population for comparison purposes
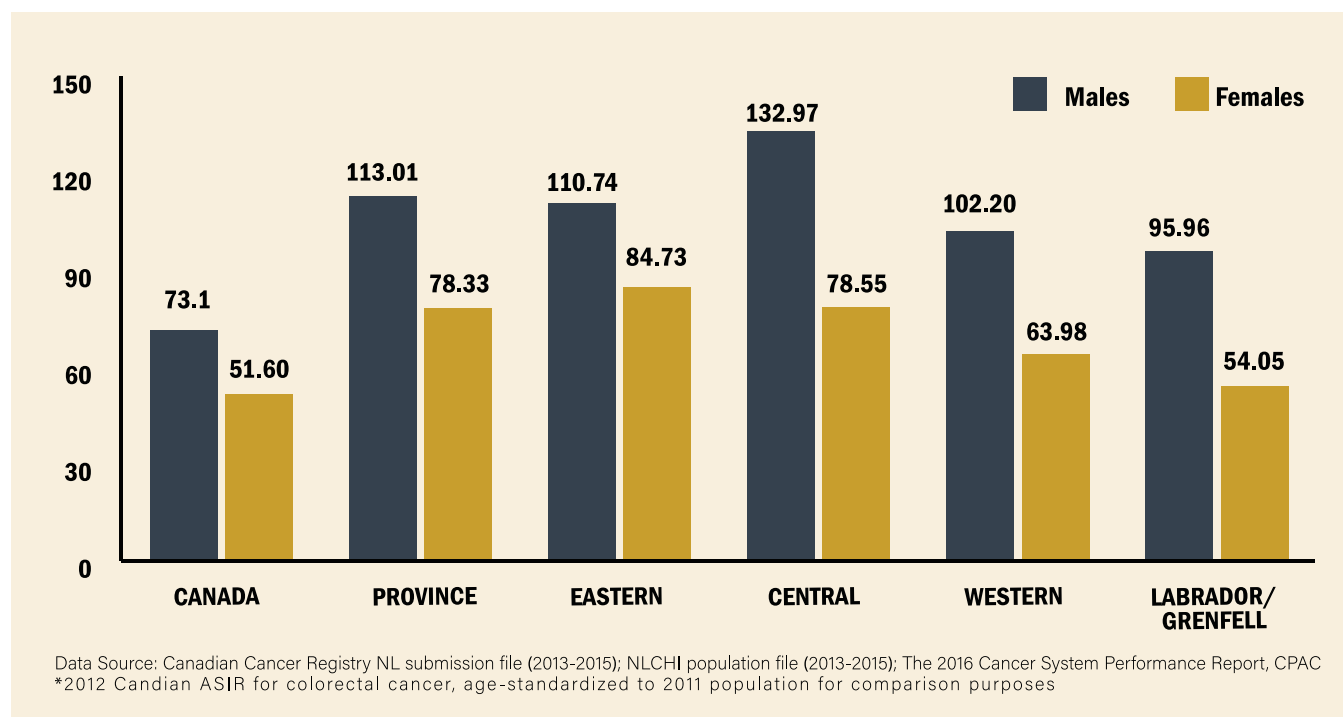
FIGURE 4.9 INCIDENCE RATES FOR COLORECTAL CANCER, BY SEX, NL, AGE-STANDARDIZED TO THE 2011 POPULATION, NL, 2006-2015

Data Source: Canadian Cancer Registry NL submission file (2006-2015); NLCHI population file (2006-2015)
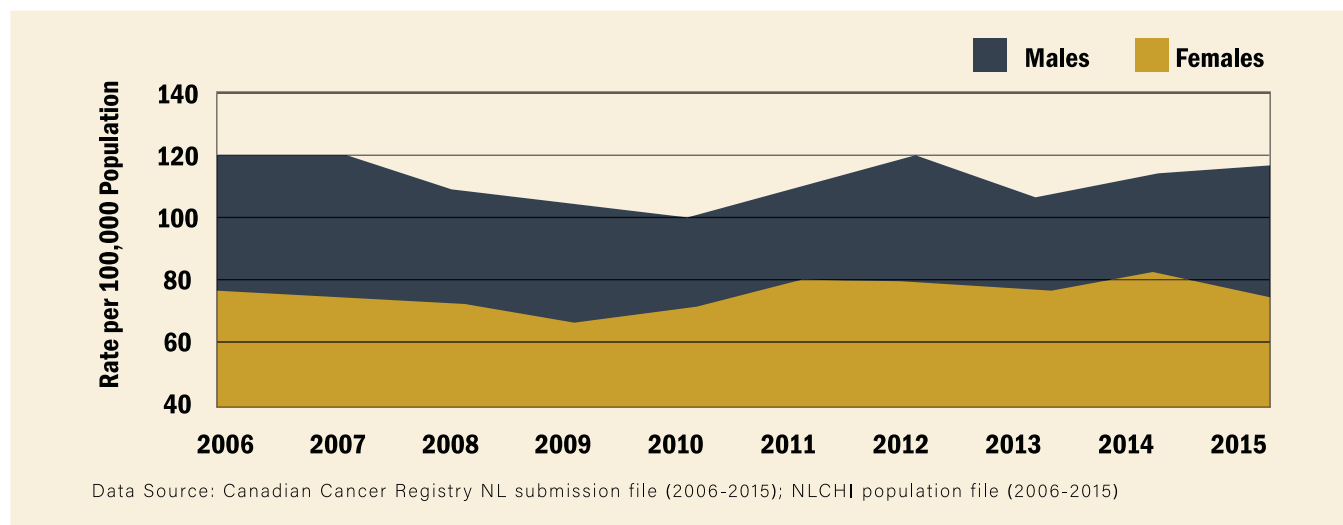
Lung: The incidence rate for lung cancer in males ranged from 79.15 cases per 100,000 in Labrador-Grenfell Health to 99.77 in Eastern Health (Figure 4.10). For women, the lowest rate occurred in Central Health and the highest in Eastern (42.06 to 73.18 cases per 100,000). Lung cancer rates in Eastern, Central, and Western Health were higher than the Canadian rate for men. The Canadian ASIR of lung cancer for women was higher than the rates for Central and Labrador-Grenfell

Health, but was lower than Eastern and Western Health rates. Figure 4.11 shows the trend in the rate of lung cancer from 2006 to 2015. The ASIR decreased slightly in men with some fluctuation from 95.82 cases in 2006 to 92.62 cases per 100,000 in 2015 (overall relative change = -3.34%). It increased slightly in the same time period for women, from 55.81 cases to 57.72 cases per 100,000 females (overall relative change = 3.42%).

FIGURE 4.10 INCIDENCE RATES FOR LUNG CANCER, BY SEX AND RHA, AGE-STANDARDIZED TO THE 2011 POPULATION, 2013-2015 COMBINED

Data Source: Canadian Cancer Registry NL submission file (2013-2015); NLCHI population file (2013-2015); CPAC 2016 report
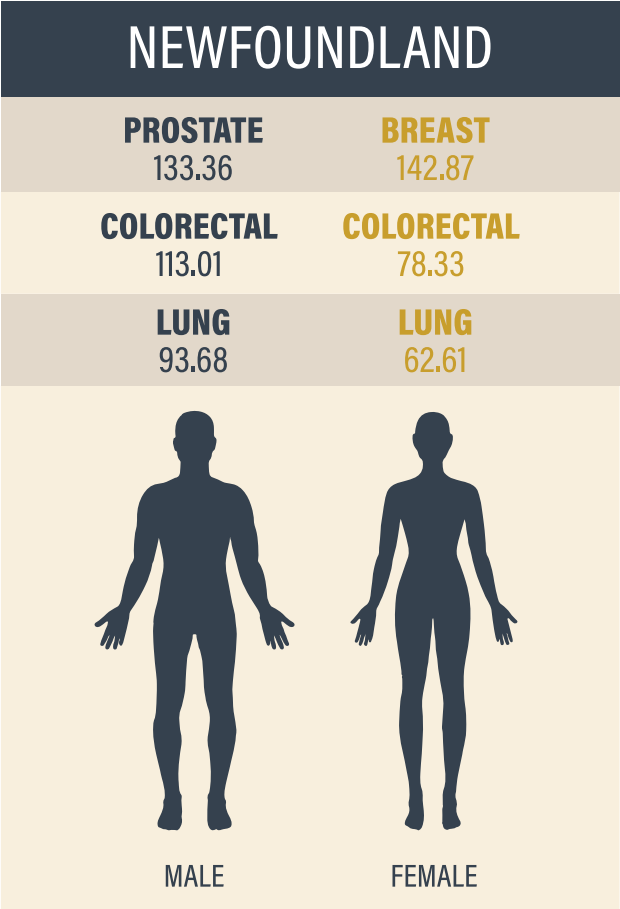*2012 Candian ASIR for lung Cancer, age-standardized to 2011 population for comparison purposes

Data Source: Canadian Cancer Registry NL submission file (2006-2013); NLCHI population file (2006-2015)
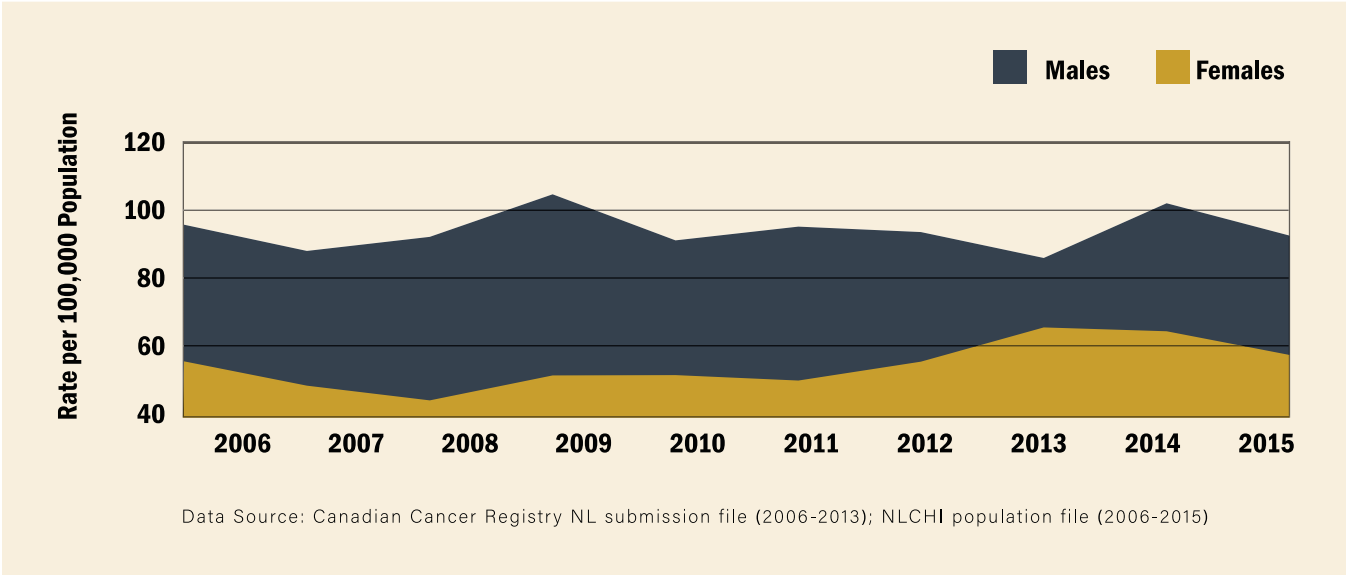
Prostate: Prostate cancer ranged from a rate of 116.33 cases per 100,000 in Central Health to 159.02 in Western Health. Except for Central Health, rates were higher in all RHAs when compared with the national rate for 2012 (Figure 4.12). As depicted in Figure 4.13, between 2006 and 2015 the ASIR for prostate cancer decreased significantly from 172.12 to 125.07 cases per 100,000 (overall relative change = -27.34%).

FIGURE 4.12 INCIDENCE RATES FOR PROSTATE CANCER, BY RHA, AGE-STANDARDIZED TO THE 2011 POPULATION, 2013-2015 COMBINED

WESTERN
159.02

CANADA
126.8

PROVINCE
133.36

**LABRADOR/
GRENFELL**
134.89

CENTRAL
116.33

EASTERN
130.75

Rate per 100,000 Population

Data Source: Canadian Cancer Registry NL submission file (2013-2015); NLCHI population file (2013-2015);
The 2016 Cancer System Performance Report, CPAC*2012 Candian ASIR for prostate cancer, age-standardized to
2011 population for comparison purposes

Data Source: Canadian Cancer Registry NL submission file (2006-2015); NLCHI population file (2006-2015)

Top Seven Cancers

Trends in the provincial ASIR for the seven most common cancers diagnosed in males between 2008 and 2015 were obtained from a Statistics Canada CANSIM table. Prostate cancer had the highest incidence amongst all disease sites, however, the ASIR for prostate cancer decreased significantly over time. The same trend was observed for lung although the absolute value of the rates observed were considerably lower than for prostate. The ASIR for CRC decreased slightly from 2008 to 2015 with some fluctuation. ASIRs for the remaining four cancers (bladder cancer, kidney cancer, non-Hodgkin's lymphoma, and stomach cancer) remained relatively stable over time.

FIGURE 4.14 INCIDENCE RATES FOR TOP SEVEN CANCERS IN MALES, NL, AGE-STANDARDIZED TO THE 2011 POPULATION, 2008-2015

Data Source: Statistics Canada CANSIM Table 103-0554
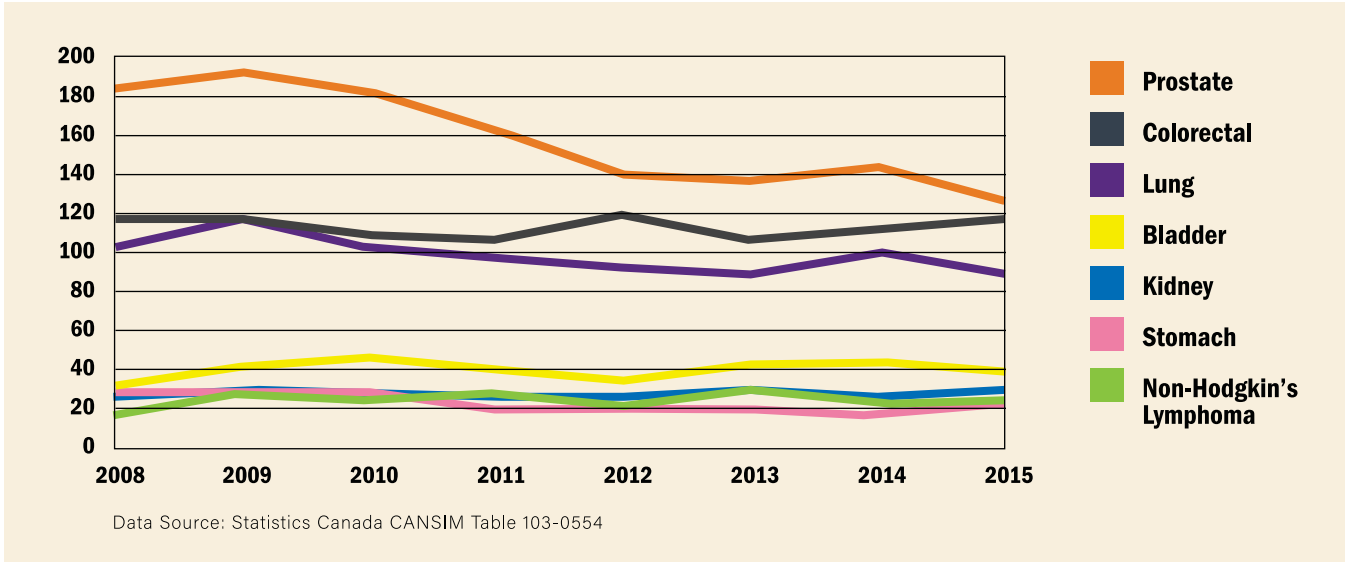
Trends for women showed that that breast cancer had the highest incidence rate for all years. The ASIR for thyroid cancer increased significantly from 15.1 cases per 100,000 in 2008 to 34.6 cases per 100,000 in 2012, then decreased steadily after 2012. The ASIR for breast cancer slightly increased from 2011 to 2014 and in 2015 there was a larger increase

from 125.8 to 149.4 cases per 100,000 females. The ASIR for lung cancer increased slightly overall, although a drop was observed in 2011, in which the ASIR decreased from 58.1 cases to 49.6 cases per 100,000. The ASIR for uterine cancer and melanoma increased slightly over time. The ASIR for CRC and non-Hodgkin lymphoma decreased slightly.

FIGURE 4.15 INCIDENCE RATES FOR TOP SEVEN CANCERS IN FEMALES, NL, AGE-STANDARDIZED TO THE 2011 POPULATION, 2008-2015

Data Source: Statistics Canada CANSIM Table 103-0554
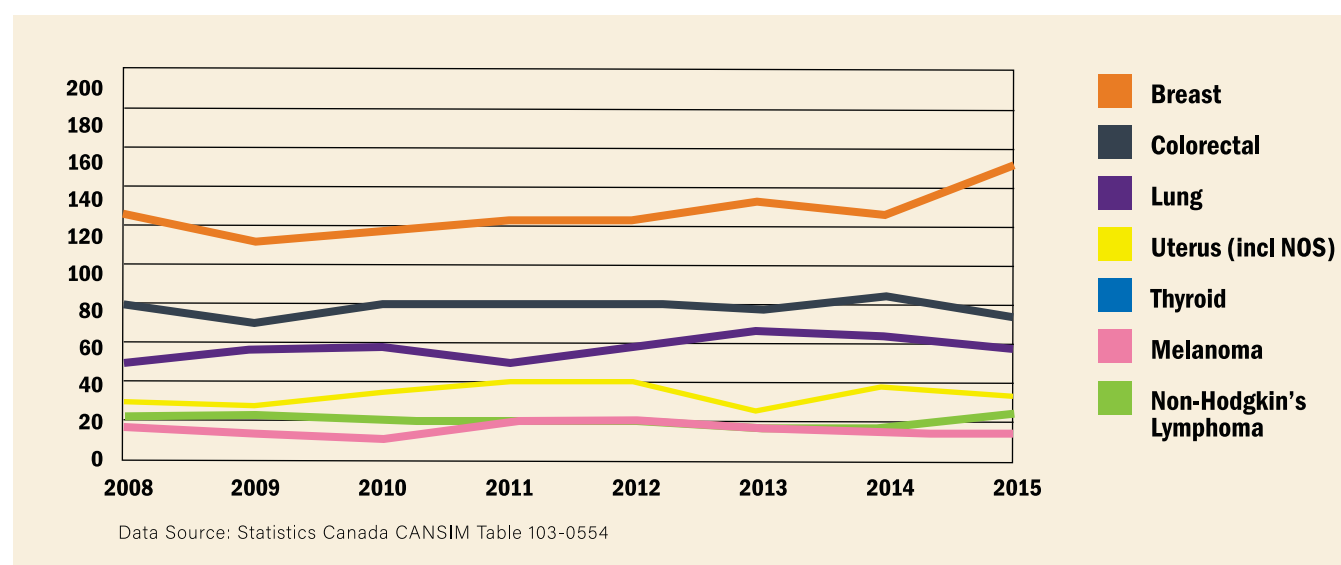
Mortality

All Cancers: The age-standardized mortality rate (ASMR) represents the number of deaths from cancer per 100,000 people that would occur in a particular area/jurisdiction if it had the same age distribution as a standard reference population. In this case the 2011 Canadian population was used.

Figure 4.16 shows the ASMRs for all types of cancer collectively for the combined years of 2011-2013. The ASMR for all cancers was higher in males than in females for all RHAs.

The provincial ASMR of all cancers was 290.75 cases for men and 205.59 cases for women per 100,000. Male ASMRs ranged from 263.96 cases in the Labrador-Grenfell Health region to 299.40 cases per 100,000 in Eastern Health. Female ASMRs ranged from 180.61 cases in the Labrador-Grenfell Health Region to 208.24 cases per 100,000 cases in Western Health.

Figure 4.17 shows the provincial ASMR for all types of cancer from 2006 to 2013. Male

Data Source: Statistics Canada NL Mortality file (2011-2013); NLCHI population file (2011-2013)
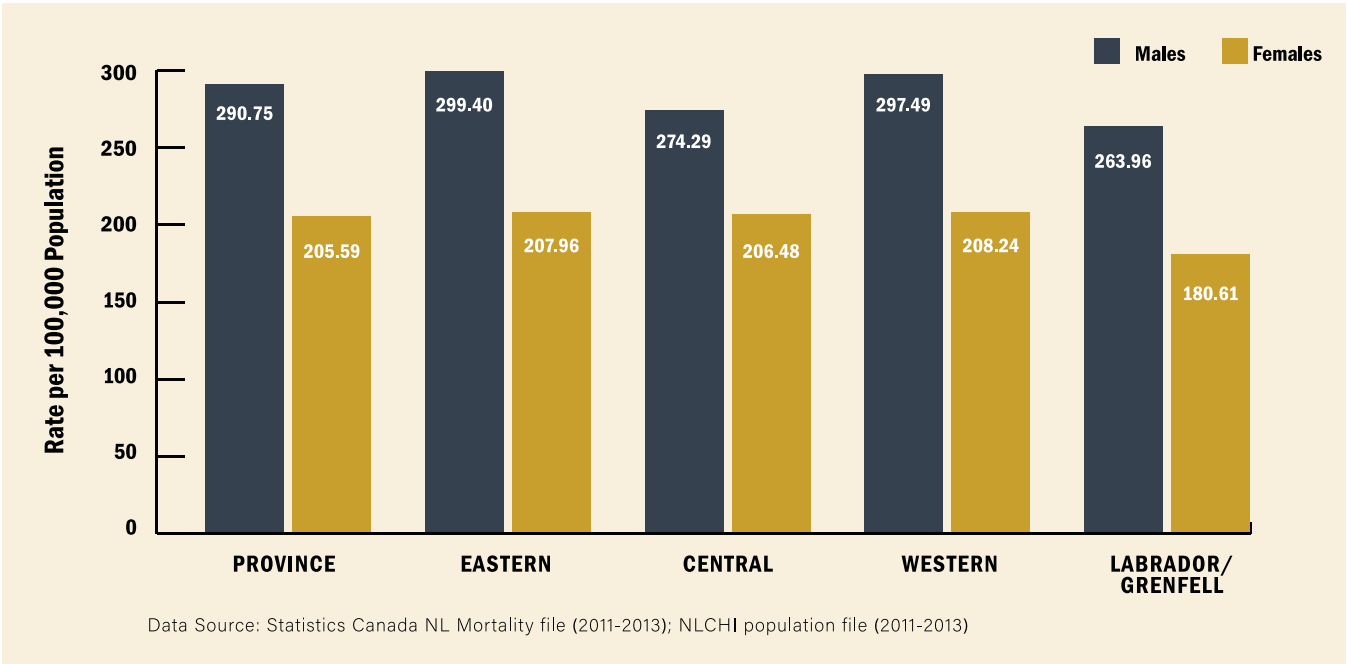
ASMRs declined from 350.80 in 2005 to 286.75 in 2013 (overall relative change = -18.25%). Female ASMRs fluctuated between 2006 and 2013, with the highest rate of 220.40 cases per 100,000 in 2013, and the lowest rate of 192.31 cases per 100,000 in 2006 (overall relative change = 14.61%).

FIGURE 4.17 MORTALITY RATES, BY SEX, NL, AGE-STANDARDIZED TO THE 2011 POPULATION, NL, 2006-2013

Data Source: Statistics Canada NL Mortality file (2011-2013); NLCHI population file (2011-2013)
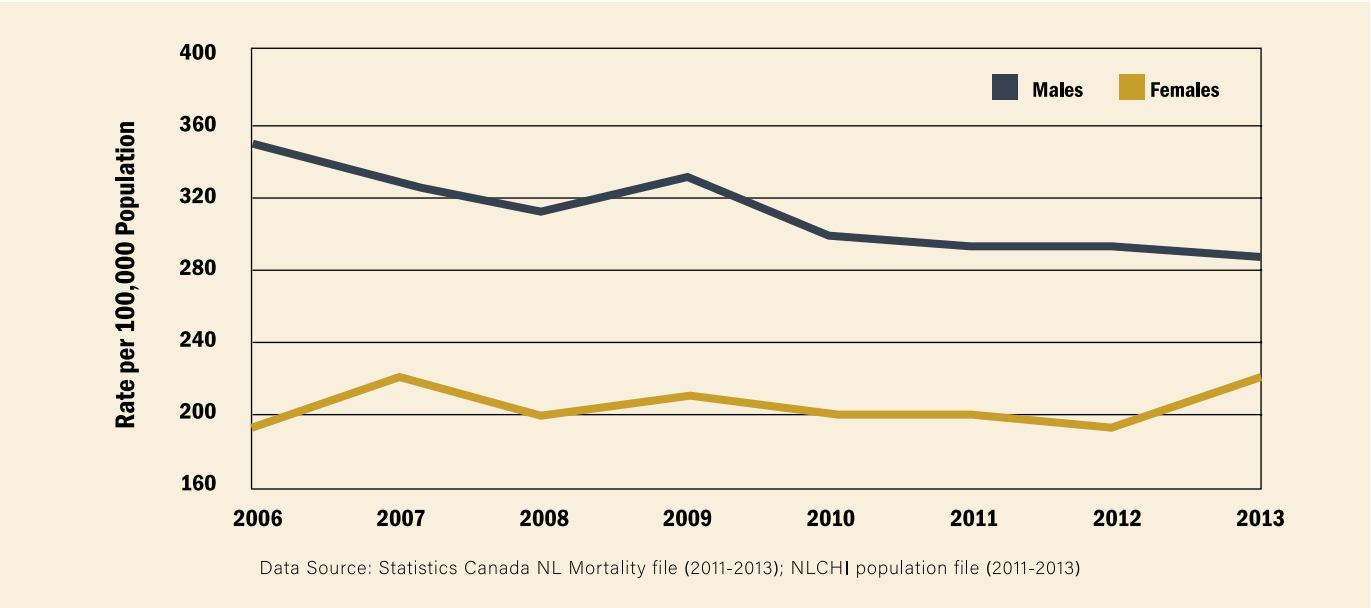
Four Most Common Cancers

Figure 4.18 shows that among the four most common cancers, lung cancer had the highest ASMR in males and females (78.05 cases per 100,000 and 41.46 cases per 100,000 respectively) for the 2011 to 2013 combined period. The ASMR for CRC was also lower in females than males. Compared to the 2012 Canadian ASMRs for the top four cancers (Figure 4.19), provincial ASMRs were higher in both males and females, except for lung cancer in NL females which was lower than the Canadian rate (41.64 vs. 46.60 per 100,000).

Data Source: Statistics Canada NL Mortality file (2011-2013); NLCHI population file (2011-2013)

Data Source: The 2016 Cancer System Performance Report, CPAC
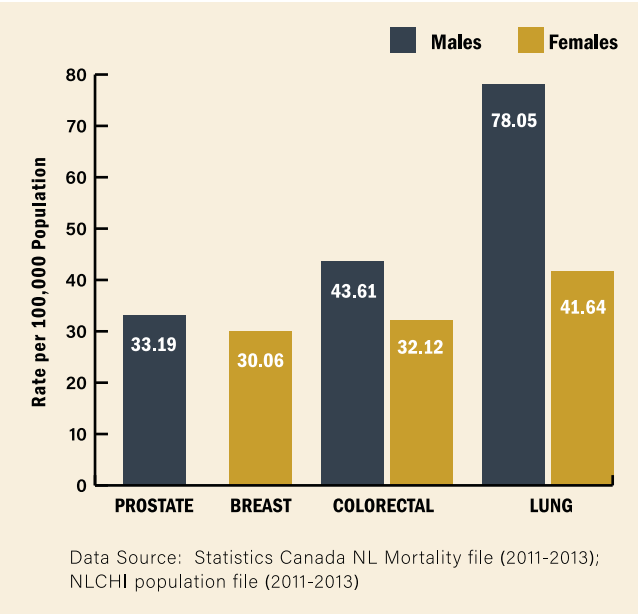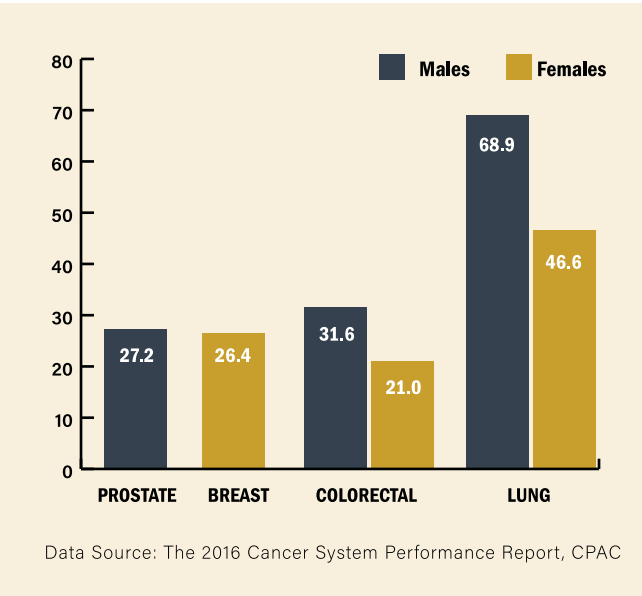
Four Most Common Cancers by RHA

Breast: Amongst the four RHAs, the highest mortality rate for breast cancer was seen in Eastern Health, although rates were relatively similar across regions. ASMRs ranged from 26.68 cases per 100,000 females in Labrador-Grenfell Health to 31.57 cases per 100,000 females in Eastern Health.

ASMRs for breast were higher in NL when compared to the 2012 national rate (26.40).

Figure 4.21 shows that the provincial ASMR for female breast cancer declined steadily from 38.01 in 2006 to 26.93 in 2013 (overall relative change = -29.15%).

FIGURE 4.20 MORTALITY RATES FOR BREAST CANCER IN FEMALES, BY RHA, AGE-STANDARDIZED TO THE 2011 POPULATION, 2011-2013 COMBINED

Data Source: Statistics Canada NL Mortality file (2011-2013); NLCHI population file (2011-2013); CPAC 2016 report
*2012 Candian ASMR for breast cancer, age-standardized to 2011 population for comparison purposes
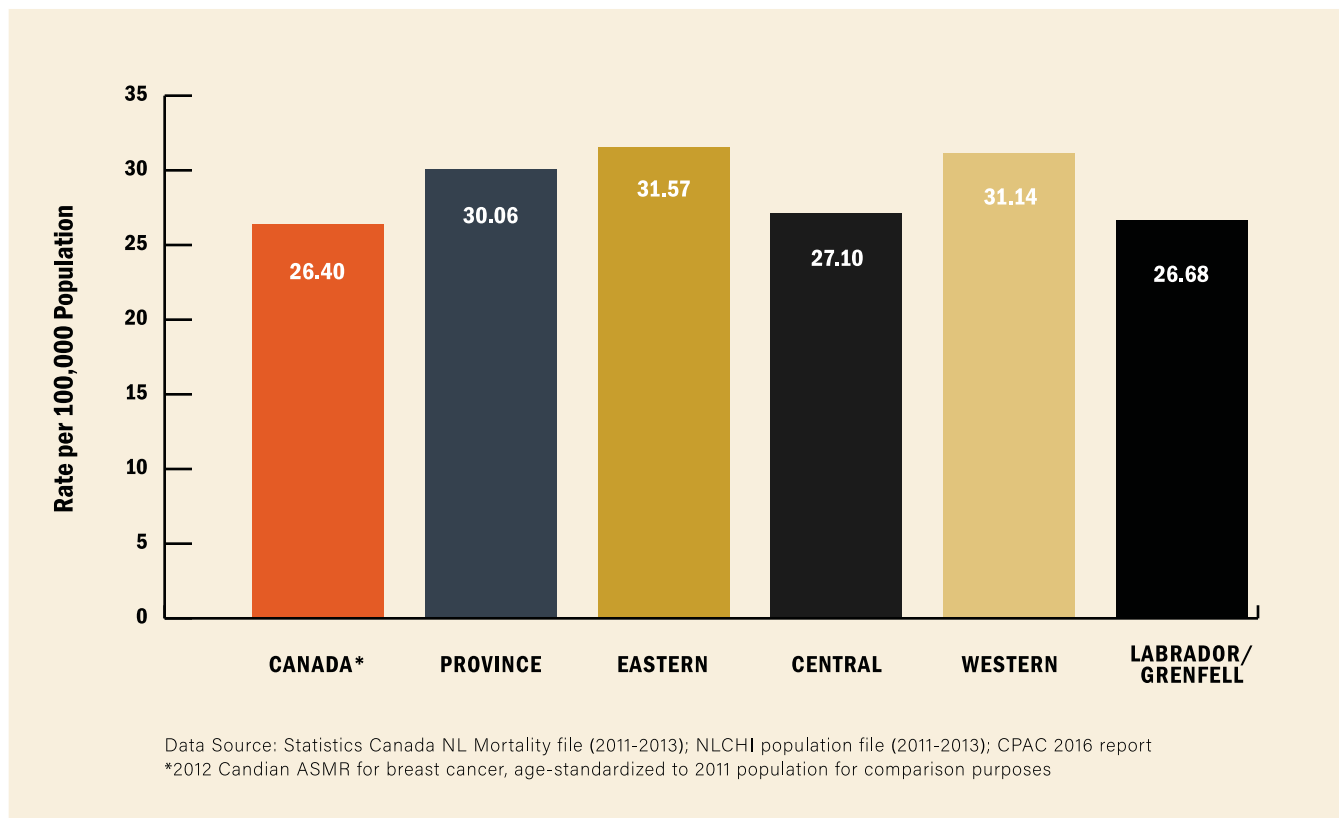
FIGURE 4.21 MORTALITY RATE FOR BREAST CANCER IN FEMALES, NL, AGE-STANDARDIZED TO THE 2011 POPULATION, NL, 2006-2013

Data Source: Statistics Canada NL Mortality file (2006-2013); NLCHI population file (2006-2013)
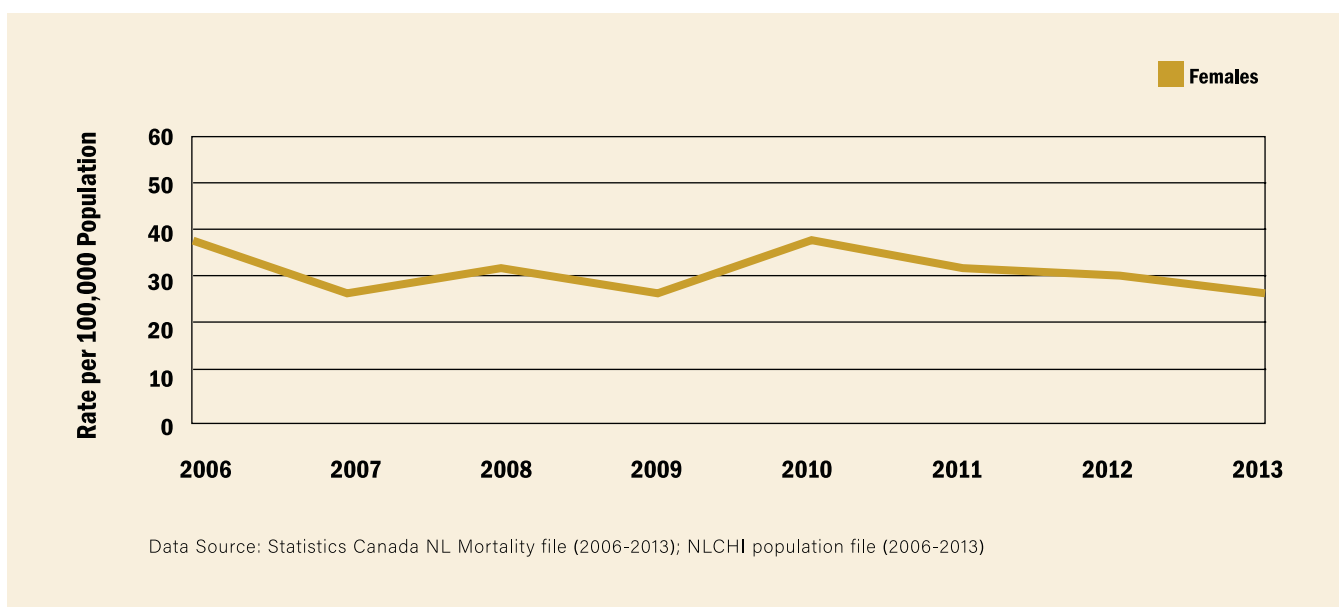
Colorectal: Mortality rates for CRC were higher for males than females in all RHAs. Rates in men ranged from 37.44 in Labrador-Grenfell Health to 45.11 in Central Health, while rates for women ranged from 29.39 in Western Health to 36.45 in Central Health.

The mortality rate for men decreased somewhat faster than for women. The overall relative change was -27.02% for men and -11.41% for women.

It is well known that NL has the highest incidence and mortality from CRC in the country.

This was reflected in the disparity between the 2012 national ASMR and the provincial and regional ASMRs for NL. Despite the higher rates, Figure 4.23 shows from 2006 to 2012, the provincial mortality rates for CRC in both males and females declined significantly overall.

FIGURE 4.22 MORTALITY RATES FOR COLORECTAL CANCER, BY SEX AND RHA, AGE-STANDARDIZED TO THE 2011 POPULATION, 2011-2013 COMBINED
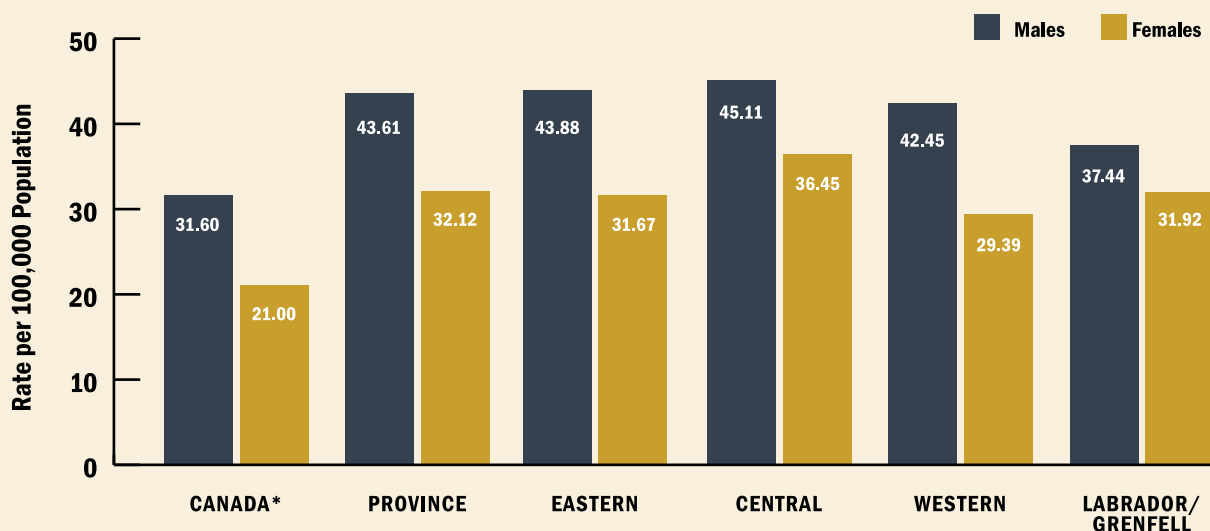
Data Source: Statistics Canada NL Mortality file (2011-2013); NLCHI population file (2011-2013); CPAC 2016 report
*2012 Canadian ASMR for colorectal cancer, age-standardized to 2011 population for comparison purposes

Data Source: Statistics Canada NL Mortality file (2006-2013); NLCHI population file (2006-2013)
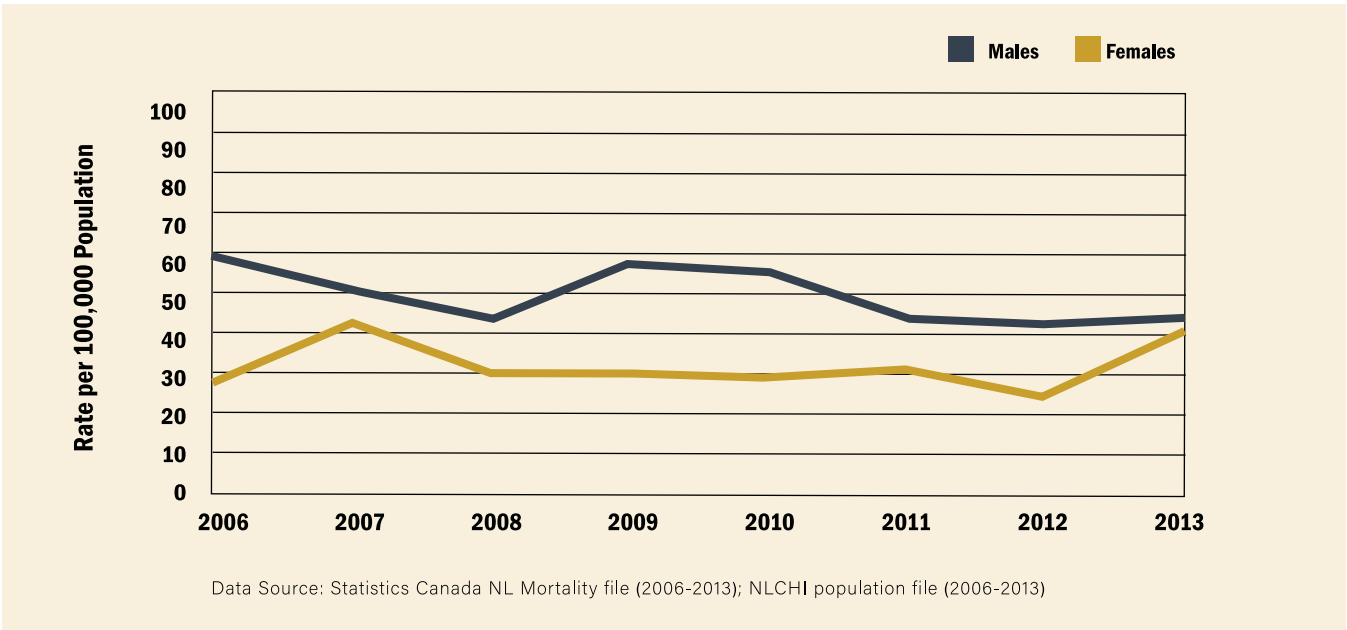
Lung: As seen with CRC, ASMRs for lung cancer were higher in men than women for all RHAs. Rates in males ranged from 61.29 in Labrador-Grenfell Health to 85.66 in Western Health, while rates in females ranged from 28.78 cases in Labrador-Grenfell Health to 50.24 in Western Health.

For men, the ASMRs for lung cancer were higher than the 2012 national mortality rate in three out of four RHAs (Eastern, Central, and Western Health). For women, regional and provincial mortality rates were lower than the national rate in all RHAs but Western.

Figure 4.25 shows from 2006 to 2013, the provincial ASMR for males declined overall. The ASMR in males decreased from 93.50 cases per 100,000 to 73.69 (overall relative change = -21.19%). The provincial ASMR for females fluctuated with a general declining trend from 2006 to 2013, ranging from 54.36 cases to 38.44 cases per 100,000 (overall relative change = -17.26% from 2007 to 2013).

FIGURE 4.24 MORTALITY RATES FOR LUNG CANCER, BY SEX AND RHA OF RESIDENCE, AGE-STANDARDIZED TO THE 2011 POPULATION, 2011-2013 COMBINED

Data Source: Statistics Canada NL Mortality file (2011-2013); NLCHI population file (2011-2013); CPAC 2016 report
*2012 Candian ASMR for lung cancer, age-standardized to 2011 population for comparison purposes
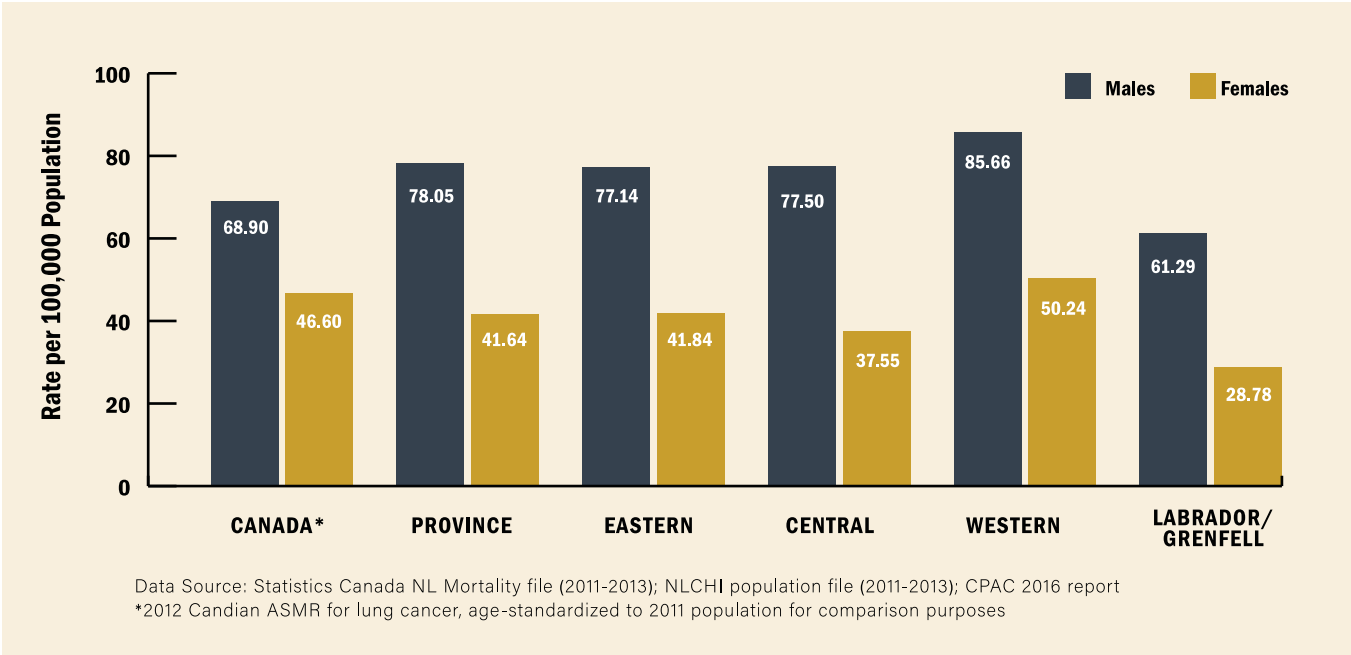
FIGURE 4.25 MORTALITY RATES FOR LUNG CANCER, BY SEX, NL, AGE-STANDARDIZED TO THE 2011 POPULATION, NL, 2006-2013

Data Source: Statistics Canada NL Mortality file (2006-2013); NLCHI population file (2006-2013)
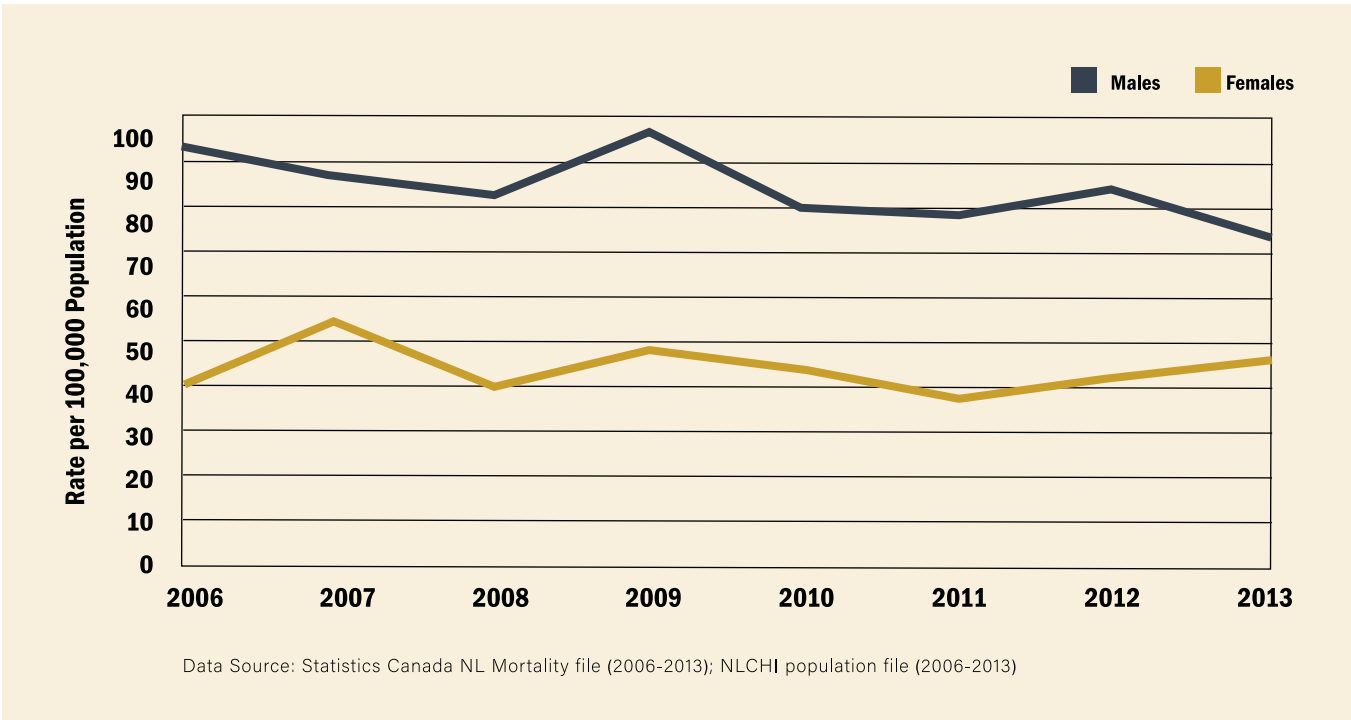
Prostate: ASMRs for prostate cancer ranged from 30.67 cases per 100,000 males in Central Health to 36.79 cases per 100,000 males in Labrador-Grenfell Health for the 2011-2013 time period. Figure 4.27 shows the provincial ASMR for prostate cancer declined steadily from 39.23 in 2006 to 34.26 cases per 100,000 males in 2013 (overall relative change = -12.67%).

The ASMRs of all the four health authorities were higher than the 2012 Canadian rate.

FIGURE 4.26 MORTALITY RATES FOR PROSTATE CANCER, BY RHA, AGE-STANDARDIZED TO THE 2011 POPULATION, 2011-2013 COMBINED

Data Source: Statistics Canada NL Mortality file (2011-2013); NLCHI population file (2011-2013); CPAC 2016 report
*2012 Candian ASMR for prostate cancer, age-standardized to 2011 population for comparison purposes
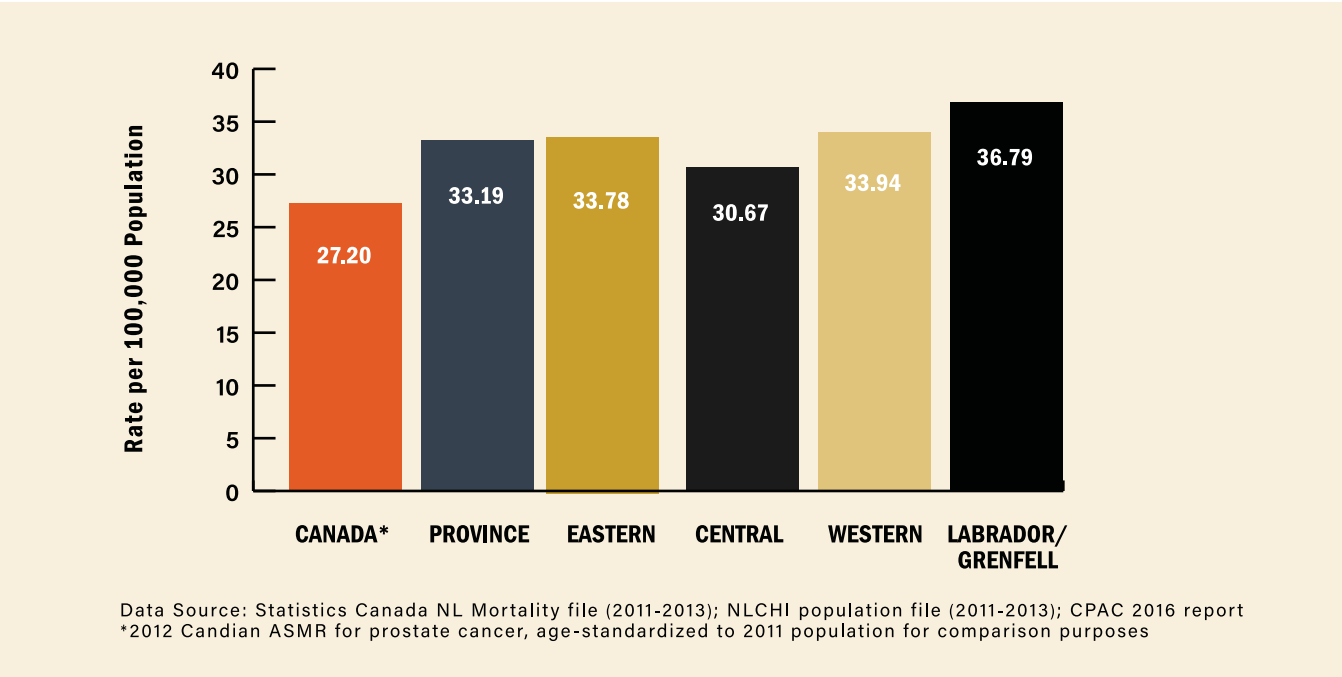
FIGURE 4.27 MORTALITY RATES FOR PROSTATE CANCER, NL, AGE-STANDARDIZED TO THE 2011 POPULATION, NL, 2006-2013

Data Source: Statistics Canada NL Mortality file (2006-2013); NLCHI population file (2006-2013)
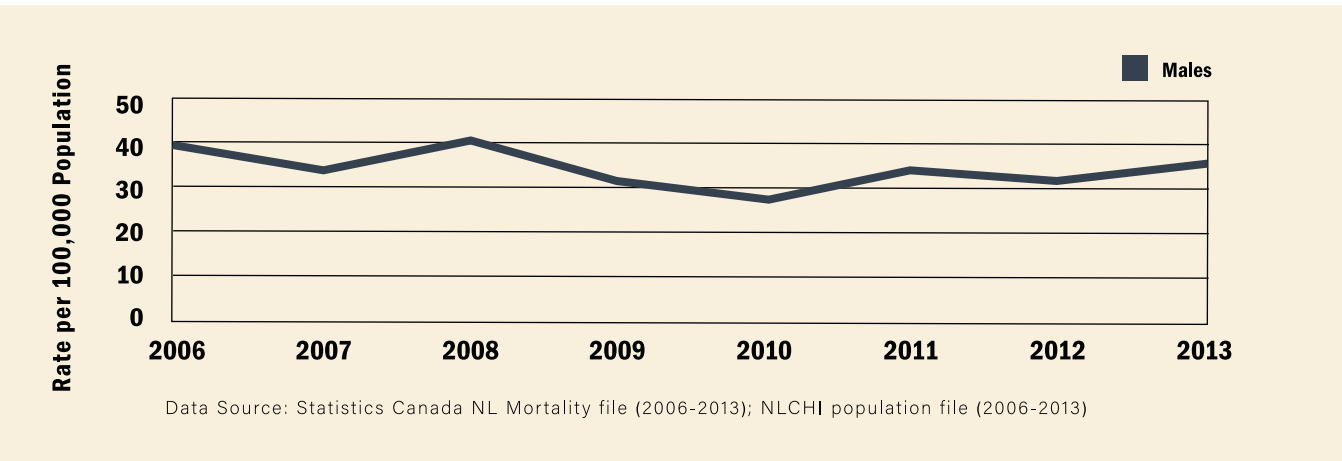
Top Seven Cancers

Trends in provincial ASMRs for the seven most common cancers diagnosed in males between 2008 and 2014 were obtained from a Statistics Canada CANSIM table. For men, lung cancer had the highest ASMR amongst all disease sites for the years reported (Figure 4.28). Although there are some fluctua-tions, rates decreased slightly for all cancers except Non-Hodgkin lymphoma. The ASMR for Non-Hodgkin lymphoma increased from 9.9 cases per 100,000 males in 2008 to 10.7 in 2014. An increase in the mortality rate of lung cancer was observed in 2014 (from 73.3 cases per 100,000 males in 2013 to 86.7 cases per 100,000 males in 2014).
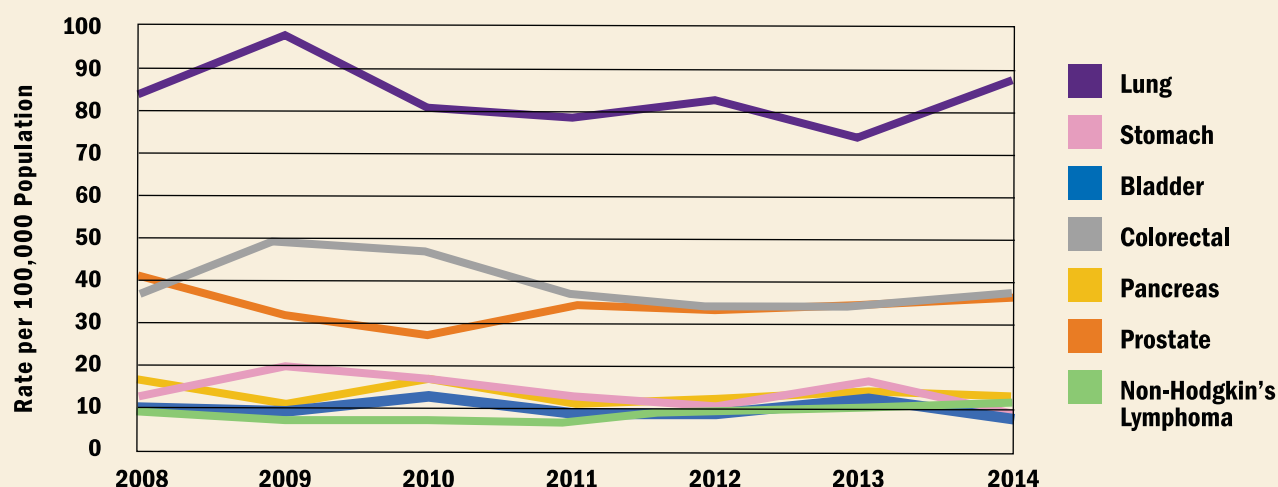
Data Source: Statistics Canada CANSIM Table 103-0553

Provincial trends in mortality rates for the top seven cancers in females from 2008 to 2014 showed that lung cancer had the highest ASMR for all years. This trend was also observed in men although the male rates were considerably higher. Slight decreases were seen in breast cancer, leukemia, and pancreatic cancer during these years. The ASMR for CRC decreased slightly from 2008 to 2012, followed by an increase (from 20.7 cases per 100,000 females in 2012 to 32.7 cases per 100,000 females in 2013). Kidney cancer rates remained steady over the time period.

Data Source: Statistics Canada CANSIM Table 103-0553
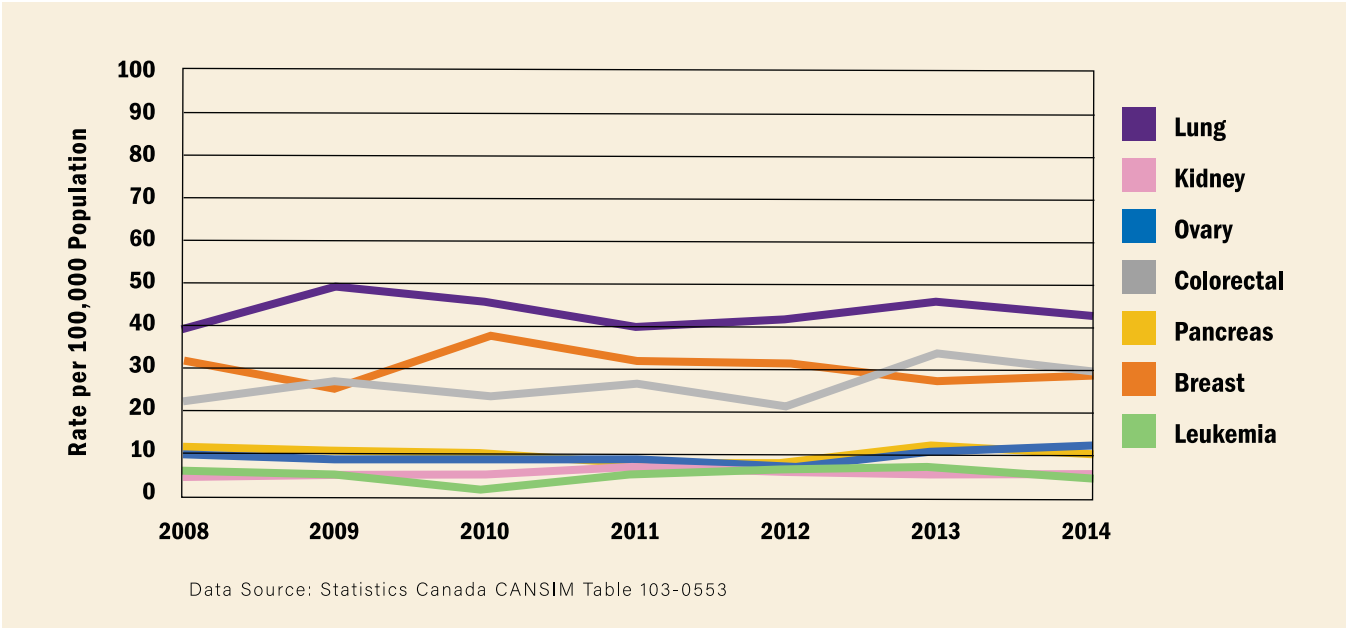
All Cancers

Relative survival represents the ratio of observed survival for a group of individuals, typically those diagnosed with a specific disease, to the expected survival for members of the general population that have the same main factors affecting survival (such as age, sex and place of residence) as the individuals with the disease. For the combined diagnosis years of 2008 -2010, the provincial five-year relative survival ratio for all types of cancers in males was slightly higher than that of females (68.60% vs. 67.10%). Amongst three of the most common cancers, the five-year relative survival ratio for female breast cancer was the highest (90.80%); the ratios for lung cancer were the lowest (21.80% for males and 22.00% for females) and were 70.80% for males and 73.90% for females diagnosed with CRC. Men with prostate cancer have comparable

FIGURE 4.30 FIVE-YEAR RELATIVE SURVIVAL RATIOS FOR ALL TYPES OF CANCERS AND THREE COMMON CANCERS, BY SEX, NL, AGE-STANDARDIZED, DIAGNOSIS YEARS OF 2008-2010 COMBINED

Data Source: Statistics Canada NL Mortality file (2011-2013); NLCHI population file (2011-2013)
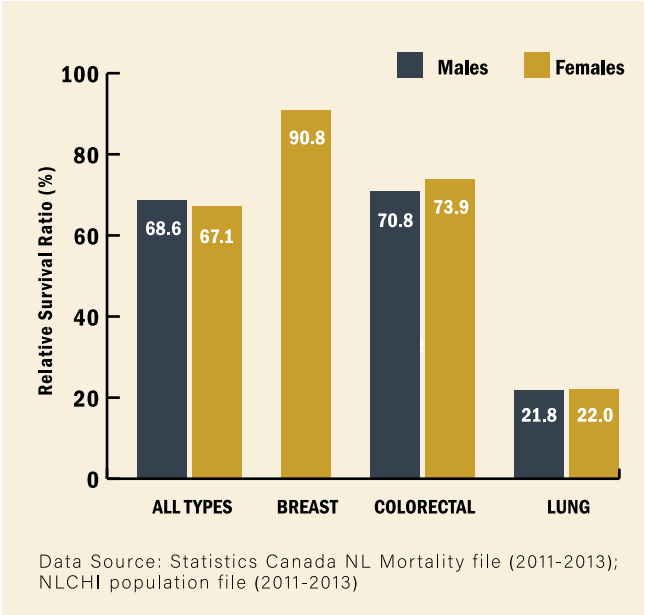
five year survival to men who do not which equates to a survival ratio of 1.00 and, as such, this is not reported in the figure below.

Between 2006 and 2010, the provincial five-year relative survival ratios for all types of cancer combined in males and in females were comparable and gradually increased at a similar rate (Figure 4.31). From 2008 to 2010, the five-year relative survival ratio in males increased by 14.73%, while the ratio for females increased by 13.03%. In 2010, the five-year relative survival ratios were 73.20% in males and 72.00% in females.

Data Source: Canadian Cancer Registry NL submission file (2006-2015)
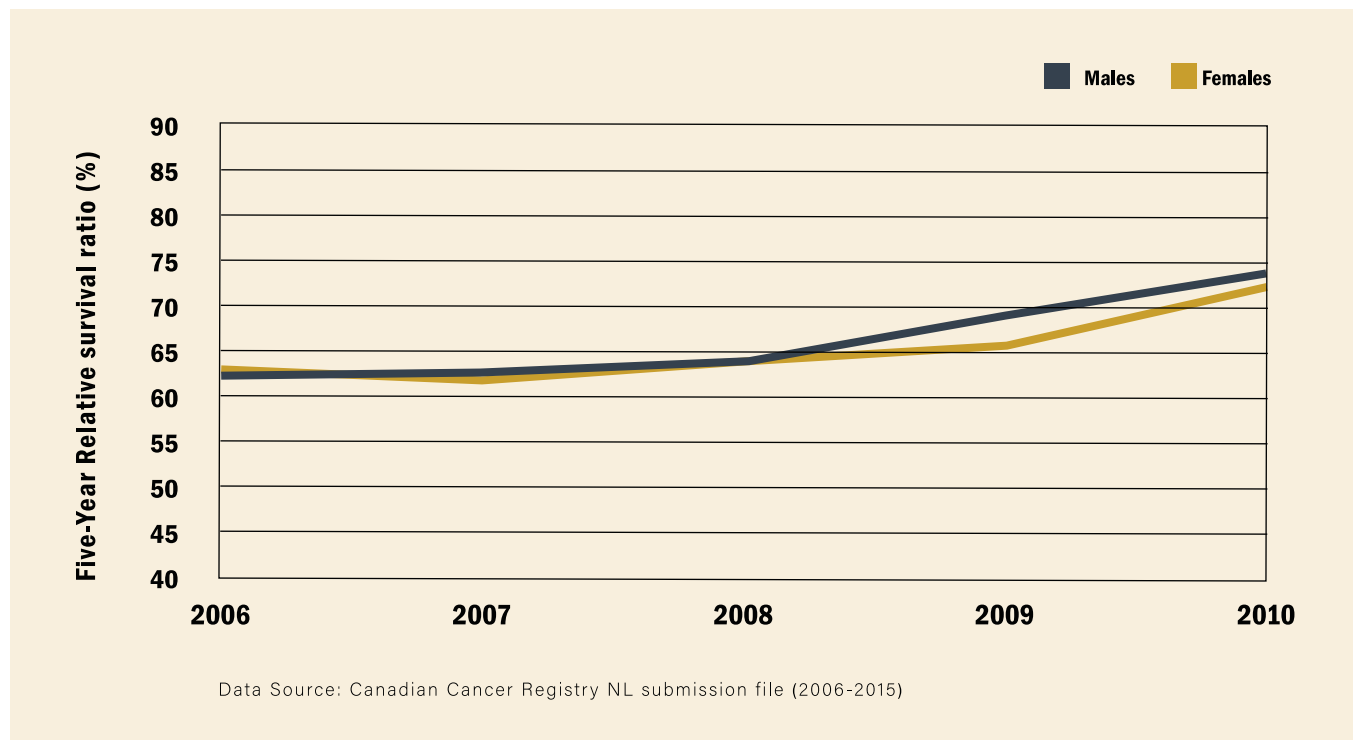
Three Most Common Cancers

As shown in Figure 4.32, the provincial five-year relative survival ratio was lowest for lung cancer (22.10%) and highest for female breast (90.80%) for cancers diagnosed in the 2008-2010 time period. Compared to the national survival ratios (available for the combined years of 2006 to 2008), **the provincial survival ratios for all the three types of cancer were higher (72.30% vs. 65.00% for CRC; 90.80% vs. 88.00% for Breast cancer; and 22.10% vs. 18.00% for lung cancer).** Prostate was excluded due to a Survival Ratio of 1.00.

Data Source: Canadian Cancer Registry NL submission file (2008-2015); CPAC 2015 report.

Breast: For breast cancers diagnosed in 2006 to 2009, the provincial five-year relative survival ratio has remained stable. But in 2010, a significant increase of the five-year relative survival ratio was observed (Figure 4.33).

Colorectal: Five-year relative survival ratios of CRC diagnosed between 2006 and 2010 increased for both males and females. However the trend patterns by sex were opposite to one another from 2006 to 2008. Male and female survival ratios were similar in 2006 (64.4% in males and 64.2% in females). The male survival ratio increased to 73.00% in 2007 and then dropped back to 66.10% in 2008; while female survival ratio first dropped first in 2007 to 63.8% and then increased to 72.7% in 2008. From 2009, male and female survival ratios

FIGURE 4.33 FIVE-YEAR RELATIVE SURVIVAL RATIOS FOR BREAST CANCER IN FEMALES, NL, AGE-STANDARDIZED, DIAGNOSIS YEARS OF 2006-2010
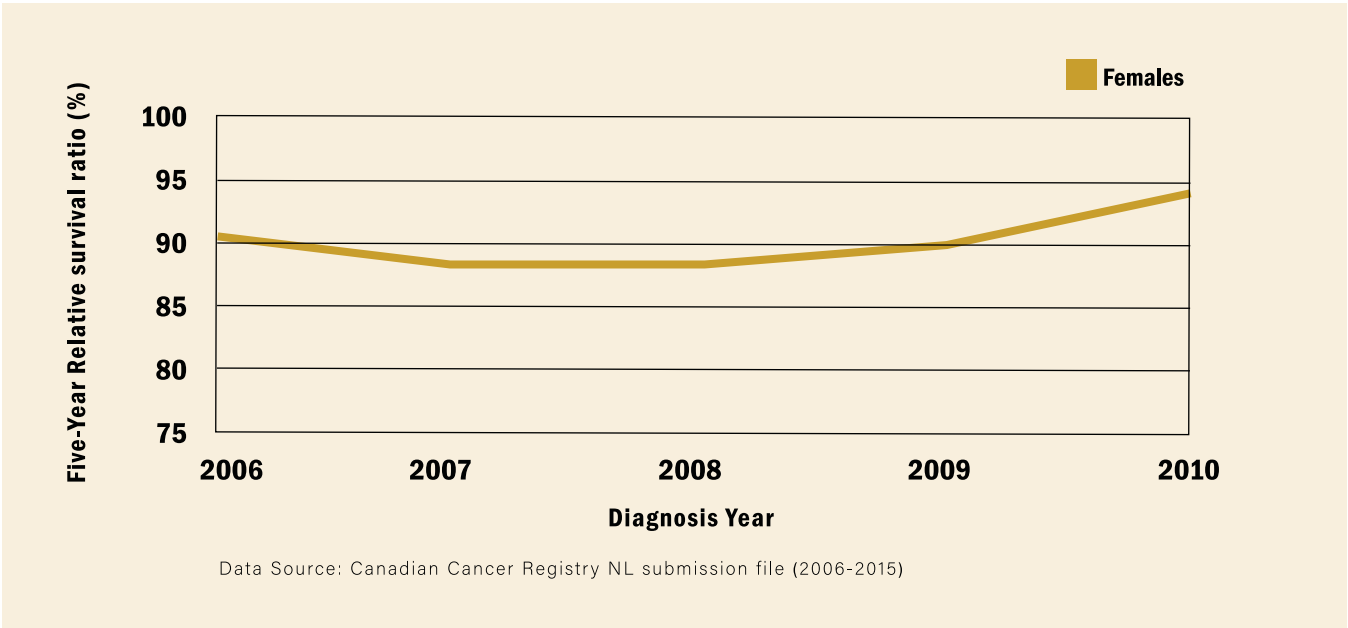
Data Source: Canadian Cancer Registry NL submission file (2006-2015)

Data Source: Canadian Cancer Registry NL submission file (2006-2015)
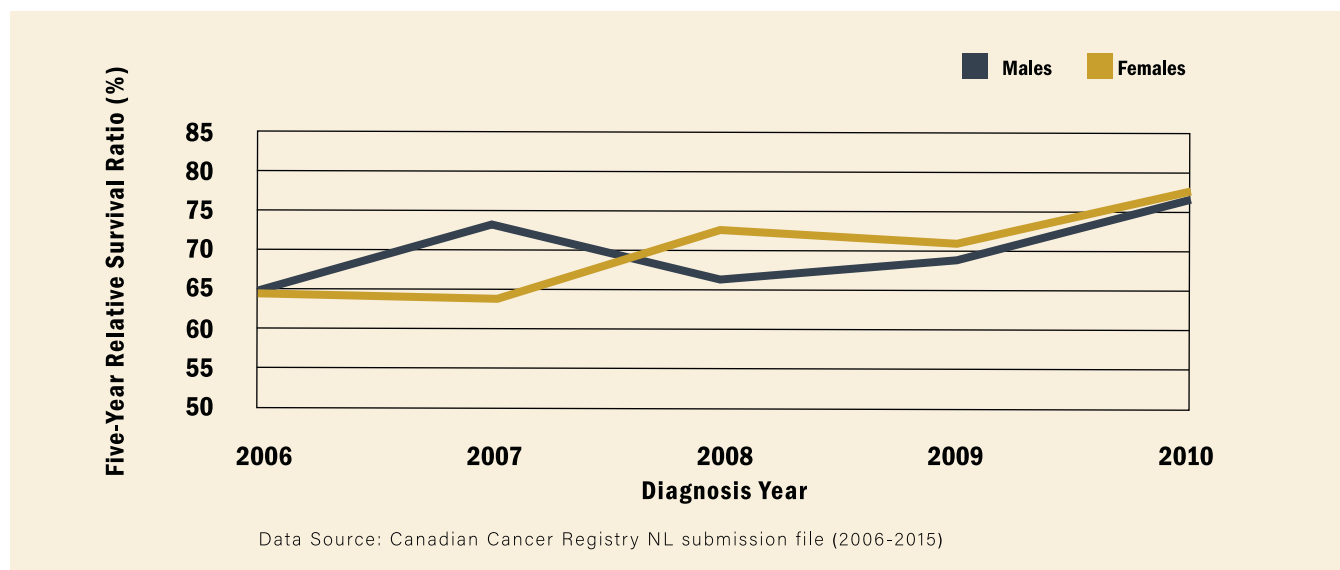
aligned again with a similar rate increase. By 2010, the five-year relative survival ratios of CRC for males and females were close (76.3% in males and 77.3% in females).

Lung: For lung cancer, the provincial five-year relative survival ratios in both males and females increased overall for those diagnosed between 2006 and 2010. In 2006, females had higher relative survival than males (16.10% vs. 10.60%) but the male survival ratio increased more rapidly. By 2009, female and male survival ratios were very similar (25.90% in females and 25.10% in males).

FIGURE 4.35 FIVE-YEAR RELATIVE SURVIVAL RATIOS FOR LUNG CANCER, AGE-STANDARDIZED, DIAGNOSIS YEARS OF 2006-2010

Data Source: Canadian Cancer Registry NL submission file (2006-2015)
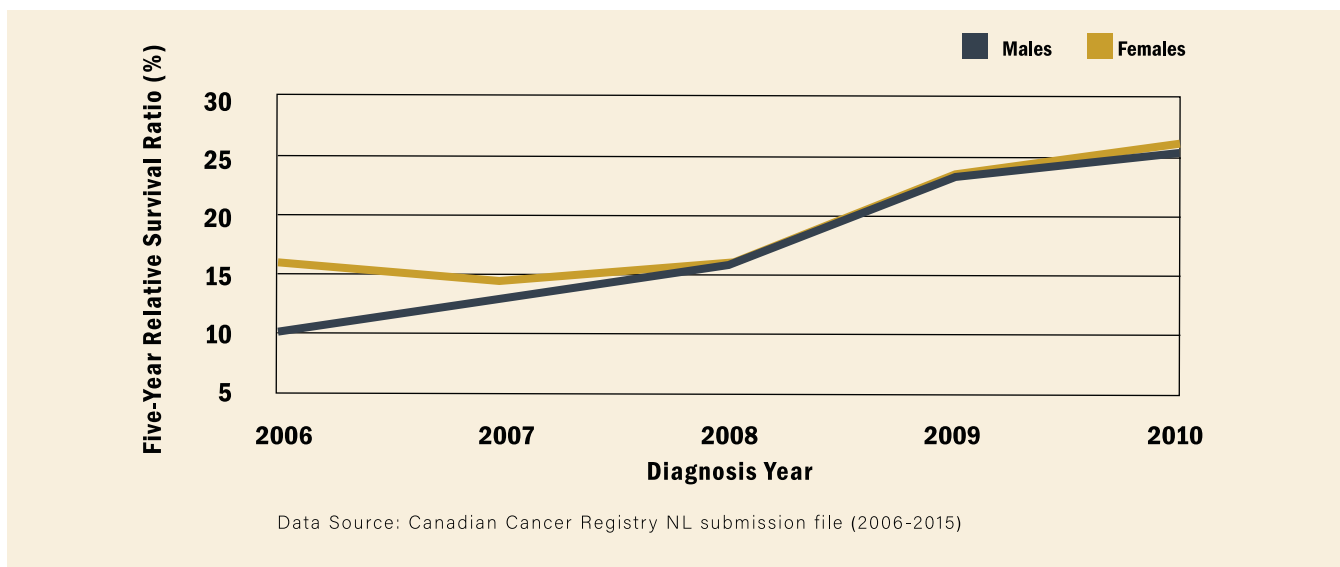
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APPENDIX A:
TECHNICAL NOTES

SCREENING

INDICATOR: Self-Reported Pap Test Rate

Definition:	Percentage of women aged 18-69 who had at least one Pap smear in the past 3 years
Numerator:	Total number of women aged 18-69 reporting having had at least one Pap test in the past 3 years
Denominator:	Total number of women aged 18-69 (excluding women who have had a hysterectomy)
Data source:	CCHS, NL Share File
Time Frame:	2012, 2013
Notes:	1. CCHS data is based on a representative sample which has been statistically weighted to represent the population of NL aged 12 years and older, unless otherwise specified 2. The institutionalized population is excluded from the CCHS coverage 3. Target: 80% participation rate among all eligible participants

INDICATOR: Cervical Screening Participation Rate

Definition:	Percentage of women aged 21-69 who had at least one Pap smear in the past 3 years
Numerator:	Total number of eligible women aged 21-69 having at least one Pap test in a three year (36 month) period
Denominator:	Total number of women aged 21-69
Data source:	Provincial Cervical Cancer Screening Database
Time Frame:	2014, 2016
Notes:	1. For the time period reported using the provincial cervical cancer screening database, the target age range for screening had changed from 18-69 years to 21-69 years 2. The Provincial Cervical Cancer Screening Database tracks all Pap screening in the province 3. Target: 80% participation rate among all eligible participants

INDICATOR: Self-Reported Mammogram Rate

Definition:	Percentage of women aged 50–69 receiving a mammogram within the past 2 years
Numerator:	Total number of women aged 50-69 reporting having had a mammogram within the past 2 years
Denominator:	Total number of women aged 50-69
Data source:	CCHS, NL Share File
Time Frame:	2011, 2012
Notes:	1. CCHS data is based on a representative sample which have been statistically weighted to represent the population of NL aged 12 years and older, unless otherwise specified 2. The institutionalized population are excluded from CCHS coverage 3. Target: 70% participation rate among all eligible participants

INDICATOR: Breast Screening Participation

Definition:	Percentage of women aged 50-74 receiving a mammogram within the past 2 years
Numerator:	Total number of women aged 50-74 having had a mammogram within the past 2 years through programmatic breast screening
Denominator:	Total number of women aged 50-74 in each catchment area for breast screening
Data source:	Provincial Breast Cancer Screening Database
Time Frame:	2015, 2016
Notes:	1. For the time period reported using the Provincial Breast Cancer Screening Database, the target age range or screening had changed from 50-69 years to 50-74 years 2. The Provincial Breast Cancer Screening Database includes only women screened through programmatic screening. Denominators are adjusted accordingly to represent only the associated geographic catchment areas. 3. Target: 70% participation rate among all eligible participants

INDICATOR: Self-Reported fecal occult blood Test (FOBT) Rate

Definition:	Percentage of the population aged 50-74 years reporting a fecal occult blood test (FOBT) in the past 2 years
Numerator:	Total number of individuals aged 50-74 reporting having had a Fecal Occult Blood Test within the past 2 years
Denominator:	Total number of individuals aged 50–74
Data source:	CCHS, NL Share File
Time Frame:	2011-2012, 2013-2014
Notes:	1. CCHS data is based on a representative sample which has been statistically weighted to represent the population of NL aged 12 years and older, unless otherwise specified 2. The institutionalized population is excluded from CCHS coverage. 3. Target: 60% participation rate among all eligible participants

INDICATOR: FIT Kits Requested in 2016

Definition:	Total number of FIT kits requested by RHA through the NL Colon Cancer Screening Program
Data source:	Provincial Colon Cancer Screening Database
Time Frame:	2016

DIAGNOSIS

INDICATOR: Cervical Pre-Cancer Detection Rate for Women Aged 21-69

Definition:	Cervical pre-cancer detection rate per 1000 screens in women aged 21-69
Numerator:	Number of women aged 21-69 who received a Pap test in whom a pre-cancerous lesion was detected
Denominator:	Women aged 21-69 receiving a screening Pap test
Data source:	Provincial Cervical Cancer Screening Database
Time Frame:	2014
Notes:	1. The Provincial Cervical Cancer Screening Database tracks all Pap screening in the province

INDICATOR: Wait Time From Abnormal Breast Screen to Resolution, Not Requiring a Tissue Biopsy

Definition:	The median and 90th percentile wait time (in weeks) from abnormal breast screen, without tissue biopsy, to resolution (test date of definitive diagnosis) in women aged 50-69. The percentage of women aged 50-69 for which the above wait time was within the target timeframe
Population:	Women aged 50 – 69 participating in the provincial breast screening program with an abnormal breast screen result not requiring a tissue biopsy
Data source:	Provincial Breast Cancer Screening Database
Time Frame:	2014
Notes:	1. Excludes tests beyond 6 months post screen
	2. The Provincial Breast Cancer Screening Database includes only women screened through programmatic screening
	3. Target: 90% of women not requiring a tissue biopsy should have resolution within 5 weeks after an abnormal breast screen

INDICATOR: Wait Time From Abnormal Breast Screen to Resolution, Requiring a Tissue Biopsy

Definition:	The median and 90th percentile wait time (in weeks) from abnormal breast screen, with tissue biopsy, to resolution (test date of definitive diagnosis) in women aged 50-69. The percentage of women aged 50-69 for which the above wait time was within the target timeframe
Population:	Women aged 50-69 participating in the provincial breast screening program with an abnormal breast screen result requiring a tissue biopsy
Data source:	Provincial Breast Cancer Screening Database
Time Frame:	2014
Notes:	1. Excludes tests beyond 6 months post screen 2. Tissue biopsy includes open and core needle biopsy 3. The Provincial Breast Cancer Screening Database includes only women screened through programmatic screening 4. Target: 90% of women requiring a tissue biopsy should have resolution within 7 weeks after an abnormal breast screen

INDICATOR: Breast Cancer Detection Rate for Women Aged 50-69

Definition:	Breast cancer detection rate per 1000 screens in women aged 50-69 who received a breast cancer screen
Numerator:	Number of women aged 50-69 who received a breast cancer screen through the provincial breast screening program being diagnosed with breast cancer
Denominator:	Women aged 50-69 participating in the provincial breast screening program with a breast screen
Data source:	Provincial Breast Cancer Screening Database
Time Frame:	2014
Notes:	1. The Provincial Breast Cancer Screening Database includes only women screened through programmatic screening 2. Target: The target detection rate is >5 per 1,000 for initial screens and >3 per 1,000 for subsequent screens

INDICATOR: Wait Time From Abnormal Fecal Test to Follow-up Colonoscopy

Definition:	The median and 90th percentile wait time (in days) from abnormal fecal test to follow-up colonoscopy in individuals who participated in the provincial colon cancer screening program. The percentage of individuals for which the above wait time was within the target time frame
Population:	Individuals who participated in provincial colon cancer screening program with an abnormal fecal test
Data source:	Provincial Colon Cancer Screening Database
Time Frame:	2015
Notes:	1. The colon cancer screening program was implemented in Eastern Health mid-year in 2015. As such, data available for Eastern Health are only for the latter part of the year 2. Target: Colonoscopy to be completed within 60 days of abnormal fecal test

INDICATOR: Breast Screening Participation

Definition:	Percentage of women aged 50-74 receiving a mammogram within the past 2 years
Numerator:	Total number of women aged 50-74 having had a mammogram within the past 2 years through programmatic breast screening
Denominator:	Total number of women aged 50-74 in each catchment area for breast screening
Data source:	Provincial Breast Cancer Screening Database
Time Frame:	2015, 2016
Notes:	1. For the time period reported using the Provincial Breast Cancer Screening Database, the target age range or screening had changed from 50-69 years to 50-74 years 2. The Provincial Breast Cancer Screening Database includes only women screened through programmatic screening. Denominators are adjusted accordingly to represent only the associated geographic catchment areas. 3. Target: 70% participation rate among all eligible participants

INDICATOR: Adenoma Detection Rate

Definition:	Adenoma detection rate per 100 individuals who had a colonoscopy following an abnormal fecal test in the provincial colon cancer screening program
Numerator:	Number of individuals in which one or more adenomas were detected through colonoscopy following an abnormal fecal test in the provincial colon cancer screening program
Denominator:	Number of individuals who had a colonoscopy following an abnormal fecal test in the provincial colon cancer screening program
Data source:	Provincial Colon Cancer Screening Database
Time Frame:	2015
Notes:	1. The colon cancer screening program was implemented in Eastern Health mid-year in 2015. As such, data available for Eastern Health are only for the latter part of the year 2. Target: A target has been set by the screening program of an adenoma detection rate of 50%, meaning 50 colonoscopies out of every 100 should yield a clinically significant finding

PERSON-CENTERED PERSPECTIVE

INDICATOR: Patient-Reported Severity of Symptom Distress

Definition:	Patients reporting mild, moderate, severe or no symptom distress on the Edmonton Symptom Assessment System-revised
Population:	Individuals with a cancer diagnosis screened for symptom distress using the Edmonton Symptom Assessment System-revised
Data source:	Screening for Distress Database
Time Frame:	2015-2016

INDICATOR: Experience of Diagnosis Delivery

Definition:	Experience of receiving a cancer diagnosis
Population:	Individuals with a cancer diagnosis who completed the Ambulatory Oncology Patient Satisfaction Survey
Data source:	NL Ambulatory Oncology Patient Satisfaction Survey Database
Time Frame:	2016

INDICATOR: Quality of Care Rating

Definition:	Rating of overall quality of care in the past six months
Population:	Individuals with a cancer diagnosis who completed the Ambulatory Oncology Patient Satisfaction Survey
Data source:	NL Ambulatory Oncology Patient Satisfaction Survey Database
Time Frame:	2016

INDICATOR: Recommendation of Health Care Providers at Cancer Care Program

Definition:	Percentage of patients who would recommend the health care providers at the Cancer Care Program to their family and friends
Population:	Individuals with a cancer diagnosis who completed the Ambulatory Oncology Patient Satisfaction Survey
Data source:	NL Ambulatory Oncology Patient Satisfaction Survey Database
Time Frame:	2016

INDICATOR: Scores on the Dimensions of the Ambulatory Oncology Patient Satisfaction Survey

Definition:	Provincial and Primary Benchmark Scores on the Six Dimensions of the Ambulatory Oncology Patient Satisfaction Survey
Population:	Individuals with a cancer diagnosis who completed the Ambulatory Oncology Patient Satisfaction Survey
Data source:	NL Ambulatory Oncology Patient Satisfaction Survey Database
Time Frame:	2016

INDICATOR: Cancer Treatment Type

Definition:	Cancer Treatment Type by Regional Health Authority; this includes surgery, oral chemotherapy, IV chemotherapy and radiation therapy
Population:	Individuals with a cancer diagnosis who completed the Ambulatory Oncology Patient Satisfaction Survey
Data source:	NL Ambulatory Oncology Patient Satisfaction Survey Database
Time Frame:	2016

INDICATOR: Travel Concerns Considered

Definition:	Experience of whether travel concerns were considered in development of treatment plan
Population:	Individuals with a cancer diagnosis who completed the Ambulatory Oncology Patient Satisfaction Survey
Data source:	NL Ambulatory Oncology Patient Satisfaction Survey Database
Time Frame:	2016

INDICATOR: Patient-Reported Wait Time to Start Chemotherapy

Definition:	Self-reported wait time from time of scheduled appointment to time started IV chemotherapy treatment
Population:	Individuals with a cancer diagnosis who completed the Ambulatory Oncology Patient Satisfaction Survey
Data source:	NL Ambulatory Oncology Patient Satisfaction Survey Database
Time Frame:	2016

INDICATOR: Patient-Reported Wait Time to Start Radiation Therapy

Definition:	Self-reported wait time from time of scheduled appointment to time started radiation treatment
Population:	Individuals with a cancer diagnosis who completed the Ambulatory Oncology Patient Satisfaction Survey
Data source:	NL Ambulatory Oncology Patient Satisfaction Survey Database
Time Frame:	2016

INDICATOR: Extent to Which Informational Needs of Patients are Met

Definition:	Experience of having informational needs met (emotional, nutritional, physical, sexual, work-related, energy and fatigue)
Population:	Individuals with a cancer diagnosis who completed the Ambulatory Oncology Patient Satisfaction Survey
Data source:	NL Ambulatory Oncology Patient Satisfaction Survey Database
Time Frame:	2016

LONG-TERM OUTCOMES
INDICATOR: Age-Standardized Incidence Rates

Definition:	The incidence rate is the number of new cancer cases per 100,000 of the NL population in a certain time frame. The age-standardized incidence rate is the rate that would have been observed if the age distribution of a specific population is the same as the standard population
Numerator:	Number of new cancer cases: all types of cancers, four most common cancers (breast, colorectal, lung and prostate)
Denominator:	Annual NL population estimate for all types of cancers, colorectal cancer and lung cancer; Annual NL female population estimate for breast cancer; Annual NL male population estimate for prostate cancer
Age-Standardization Method:	Direct standardization using 2011 Canadian census population as standard population
Inclusion:	All Malignant cancers with primary sites; NL residents only

Selected cancers were identified using International Classification of Diseases for Oncology, Third Edition (ICD-O-3)codes, World Health Organization:
1. Colorectal: site codes --C18.0, C18.2 to C18.9, C19.9, C20.9, C26.0
2. Lung: site codes --C34.0-C34.9
3. Female breast: site codes --C50.0-C50.9
4. Prostate: site codes --C61.9
5. All types of Cancers:
   a. Buccal cavity and pharynx: site codes --C00.0-C14.9
   b. Digestive system: site codes --C15.0-C26.9
   c. Respiratory system: site codes --C30.0-C39.9
   d. Bones and joints: site codes --C40.0-C41.9
   e. Skin (excluding basal and squamous): site codes --C43.0-C44.9
   f. Soft tissue (including heart): site codes --C45.0-C49.9
   g. Breast: site codes --C50.0-C50.9
   h. Female genital system: site codes --C51.0-C58.9
   i. Male genital system: site codes --C60.0-C63.9
   j. Urinary system: site codes --C64.0-C68.9
   k. Eye: site codes --C69.0-C69.9
   l. Brain and other nervous system: site codes --C70.0-C72.9
   m. Endocrine: site codes --C73.0-C75.9
   n. Lymphomas: Histology code-- 9590'-'9596';'9650'-'9667'; '9670'-'9719';'9727'-'9729'; '9823' and '9827' and site codes not in (C42.0, C42.1, and C42.4)
   o. Multiple myeloma: Histology code-- '9731'-'9732' or '9734'
   p. Leukemia: Histology code--'9826';'9835'-'9837';9823 and 9287 and site codes in (C42.0, C42.1, and C42.4); '9863';'9875'-'9876';

	'9945'-'9946';'9733';'9742';'9800'-'9801';'9805'; '9820';'9831'-'9834';'9860';'9870';'9891' '9930'-'9931';'9940';'9948';'9963'-'9964' q. Mesothelioma: Histology code--'9050'-'9055' r. Kaposi Sarcoma: Histology code--'9140' s. Other, ill-defined, and unknown sites: Histology code--'9740'-'9741'; '9750'-'9758';'9760'-'9769;'9950'-'9962';'9970'-'9989';('8000'-'9049; '9056'-'9139';'9141'-'9589' and site codes in ('C76.0'-'C76.8'; C42.0-C42.4;C77.0-C77.9; C80.9)); ('8000'-'9049;'9056'-'9139'; '9141'-'9589' and site codes in ('c760'-'c768'))
Stratification:	RHA and sex
Data source:	Canadian Cancer Registry NL submission file; NLCHI population file
Time Frame:	1. Incidence rate by RHA and sex: 2011- 2013 combined. 2. Provincial incidence rate trend: 2006 – 2013
Notes:	1. Canadian age-standardized incidence rates for 2012 are extracted from the CPAC 2016 System Performance report directly as a reference. 2. Age-standardized incidence rates for the top seven cancers in NL are extracted from the Canadian Cancer Society (CCS) 2016 report. Although CPAC and CCS use the same standard population in age standardization, CCS uses projection methodology to calculate the incidence rate which is different from the methodology of CPAC. As a result, the rates from CCS report might be not comparable with the rates presented in this report in which CPAC methodology are applied.

INDICATOR: Age-Standardized Incidence Rates by Stage

Definition:	The stage-specific age-standardized incidence rate per 100,000 of the NL population in a certain time frame
Age-Standardization Method:	Direct standardization using 2011 Canadian census population as standard population
Data source:	CPAC 2015 System Performance Report
Time Frame:	2010-2012 combined
Notes:	Stage information was not provided in Canadian Cancer Registry NL submission file. Age-standardized incidence rates by stage in this report are extracted from CPAC 2015 report directly

INDICATOR: Age-Standardized Mortality Rates

Definition:	The mortality rate is the number of deaths due to cancer per 100,000 of the NL population in certain time frame. The age-standardized mortality rate is the rate that would have been observed if the age distribution of a specific population is the same as the standard population
Numerator:	Number of deaths due to cancer: all types of cancers, four most common cancers (breast, colorectal, lung and prostate)
Denominator:	Annual NL population estimate for all types of cancers, colorectal cancer and lung cancer; Annual NL female population estimate for breast cancer; Annual NL male population estimate for prostate cancer
Age-Standardization Method:	Direct standardization using 2011 Canadian census population as standard population
Inclusion:	NL residents only Deaths due to selected malignant cancers were identified using International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10) codes of underlying cause of death: 1. Colorectal : C18-C20, C26.0 2. Lung : C34 3. Female breast: C50 4. Prostate: C61 5. All types of Cancers: C00-C97
Stratification:	RHA and sex
Data source:	Statistics Canada NL Mortality file; NLCHI population file
Time Frame:	1. Mortality rate by RHA and sex: 2010-2012 combined 2. Provincial incidence rate trend: 2005-2012
Notes:	1. Canadian age-standardized incidence rates for 2012 are extracted from the CPAC 2016 System Performance report directly as a reference 2. Age-standardized morality rates for the top seven cancers in NL are extracted from Canadian Cancer Society (CCS) 2016 report. Although CPAC and CCS use the same standard population in age standardization, CCS uses projection methodology to calculate the mortality rate which is different from the methodology of CPAC. As a result, the rates from CCS report might be not comparable with the rates presented in this report in which CPAC methodology are applied

INDICATOR: Age-standardized relative survival ratios

Definition:	Relative survival ratio is the ratio of the proportion of observed survivors in a group of cancer patients to the proportion of expected survivors in the cancer free population who have same characteristics (sex and age) as the cancer cohort. The age-standardized relative survival ratio is the relative survival ratio that would have been observed if the age distribution of the cancer cohort had been the same as that of the standard population
Numerator:	Observed five-year cumulative survival probabilities of cancer patients diagnosed during 2006-2009: all types of cancers, four most common cancers (breast, colorectal, lung and prostate)
Denominator:	Expected five-year survival probabilities of comparable cancer-free population
Age-Standardization Method:	Age-standardized to people diagnosed with cancer in Canada between 1992 and 2001

Inclusion:	All Malignant cancers with primary sites; NL residents only. Selected cancers were identified using (International Classification of Diseases for Oncology, Third Edition (ICD-O3) codes, World Health Organization:
	1. Colorectal : site codes --C18.0, C18.2 to C18.9, C19.9, C20.9, C26.0
	2. Lung: site codes --C34.0-C34.9
	3. Female breast: site codes --C50.0-C50.9
	4. Prostate: site codes --C61.9
	5. All types of Cancers:
	    a. Buccal cavity and pharynx: site codes --C00.0-C14.9
	    b. Digestive system: site codes --C15.0-C26.9
	    c. Respiratory system: site codes --C30.0-C39.9
	    d. Bones and joints: site codes --C40.0-C41.9
	    e. Skin (excluding basal and squamous): site codes --C43.0-C44.9
	    f. Soft tissue (including heart): site codes --C45.0-C49.9
	    g. Breast: site codes --C50.0-C50.9
	    h. Female genital system: site codes --C51.0-C58.9
	    i. Male genital system: site codes --C60.0-C63.9
	    j. Urinary system: site codes --C64.0-C68.9
	    k. Eye: site codes --C69.0-C69.9
	    l. Brain and other nervous system: site codes --C70.0-C72.9
	    m. Endocrine: site codes --C73.0-C75.9
	    n. Lymphomas: Histology code-- '9590'-'9596';'9650'-'9667'; '9670'-'9719';'9727'-'9729'; '9823' and '9827' and site codes not in (C42.0, C42.1, and C42.4)
	    o. Multiple myeloma: Histology code-- '9731'-'9732' or '9734'
	    p. Leukemia: Histology code--'9826';'9835'-'9837';9823 and 9287

	and site codes in (C42.0, C42.1, and C42.4); '9863';'9875'-'9876'; '9945'-9946';'9733';'9742';'9800'-'9801';'9805'; '9820';'9831'-'9834';'9860';'9870';'9891';'9930'-'9931';'9940';'9948';'9963'-'9964' q. Mesothelioma: Histology code--'9050'-'9055' r. Kaposi Sarcoma: Histology code--'9140' s. Other, ill-defined, and unknown sites: Histology code--'9740'-'9741'; '9750'-'9758';'9760'-'9769;'9950'-'9962';'9970'-'9989';('8000'-'9049; '9056'-'9139';'9141'-'9589' and site codes in ('C76.0'-'C76.8'; C42.0-C42.4;C77.0-C77.9; C80.9)); ('8000'-'9049;'9056'-'9139'; '9141'-'9589' and site codes in ('c760'-'c768'))
Stratification:	Sex
Data source:	Canadian Cancer Registry NL submission file
Time Frame:	1. Five-year relative survival ratio by sex: 2007-2009 combined 2. Five-year relative survival ratio trend: 2006-2009
Notes:	1. Cohort method is used in this five-year survival analysis. The patients selected in the cohort were diagnosed no later than 2009. As the latest available death information in NL CCR submission file is 2014, this method ensures all the selected patients have potential for a 5-year follow up period. 2. Five-year relative survival ratio for prostate cancer is not reported due to the fact that the prognosis of prostate cancer is very good within five years after diagnosis. Recent research shows that the five-year relative survival rate for all stages of prostate cancer is almost 100% (American Cancer Society). Therefore, five-year relative survival ratios for prostate cancer would not provide valuable information for the assessment of long-term outcomes of prostate cancer. 3. Canadian age-standardized relative survival ratios for three common cancers (breast, colorectal and lung cancer) for 2006-2008 combined are extracted from the CPAC 2015 System Performance report directly as a reference.

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