CANADIAN PARTNERSHIP AGAINST CANCER | PARTENARIAT CANADIEN CONTRE LE CANCER

Examining Disparities in Cancer Control:

A System Performance Special Focus Report

February 2014

Technical Appendix

For more information on this Report or to receive a hard copy of the Technical Appendix, please contact Rami Rahal, Director System Performance & Surveillance, at Rami.Rahal@partnershipagainstcancer.ca.

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Risk Factors

Smoking Prevalence

Definition:	Percentage of population aged 12 years and older in each specified group—daily, occasional
Measurement Timeframe:	2011
Data Source:	Canadian Community Health Survey
Denominator:	Total population, aged 12 years and older
Numerator:	Number of daily, occasional smokers, aged 12 years and older
CCHS Variables:	• Have smoked 100 or more cigarettes during lifetime • Ever smoked a whole cigarette • Type of smoker at present time • Ever smoked cigarettes daily
Stratification Variables:	• Household income quintile • Geography • Immigration status (in Canada <10 years , in Canada 10+ years, Canadian-born)
General Notes:	1. CCHS data is based on representative sample which is then extrapolated to the overall population. 2. In the CCHS, the Territories are excluded from income analysis

Smoking Cessation

Definition:	Percentage of recent smokers aged 20 and older that quit smoking in the previous 2 years
Measurement Timeframe:	2011
Data Source:	Canadian Community Health Survey
Denominator:	Recent quitters plus current smokers (those who are currently daily or occasional smokers) , aged 20 years and older
Numerator:	Recent quitters: former smokers who were no longer smoking at the time of the survey who have quit in the last 2 years
CCHS Variables:	• Current smoking status • Number of years stopped smoking daily • Number of years stopped smoking completely
Stratification Variables:	• Household income quintile • Geography • Immigration status (in Canada <10 years , in Canada 10+ years, Canadian-born)
General Notes:	1. CCHS data based on representative sample which is then extrapolated to the overall population. 2. In the CCHS, the Territories are excluded from income analysis

Alcohol Consumption—Low-risk drinking guideline

Definition:	Percentage of adults aged 18 years and older that reported exceeding the low-risk drinking guideline as defined below: ***Low-Risk Drinking Guideline:*** An AVERAGE of no more than 2 drinks per day for males, and an AVERAGE of no more than 1 drink per day for females. The daily average was calculated based on the total number of drinks the respondent reported consuming in the week prior to the CCHS interview, divided by 7 days.
Measurement Timeframe:	2005 and 2011
Data Source:	Canadian Community Health Survey
Denominator:	Total population (aged 18 years and older)
Numerator:	Number of adults (aged 18 years and older) who reported exceeding the low-risk drinking guideline
CCHS Variables:	• During the past 12 months, have you had a drink of beer, wine, liquor or any other alcoholic beverage? • Thinking back over the past week, did you have a drink of beer, wine, liquor or any other alcoholic beverage? • How many drinks did you have on each day during the past week?
Stratification Variables:	• Household income quintile • Geography • Immigration status (in Canada <10 years , in Canada 10+ years, Canadian-born)
General Notes:	1. The word drink means: 1 bottle or can of beer or a glass of draft, 1 glass of wine or a wine cooler, or 1 drink or cocktail with 1 1/2 ounces of liquor. 2. CCHS 2005 data include all the provinces/territories. CCHS 2011 data include MB, NL, ON, QCSK. 3. CCHS data is based on representative sample which is then extrapolated to the overall population. 4. In the CCHS, the Territories are excluded from income analysis

Overweight & Obesity Rates—Adults

Definition:	Percentage of adults aged 18 years and older at each BMI and in the BMI groups—overweight (BMI 25.00–29.99); or obese (BMI 30.00+)
Measurement Timeframe:	2011
Data Source:	Canadian Community Health Survey
Denominator:	Total number of adults (aged 18 years and older) with valid height and weight responses
Numerator:	Number of adults (aged 18 years and older) at each BMI and in each BMI group - overweight or obese
CCHS Variables:	• Self-reported weight (kg) • Self-reported height (m) • Calculated BMI values: BMI=weight/(height)^2
Stratification Variables:	• Household income quintile • Geography • Immigration status (in Canada <10 years , in Canada 10+ years, Canadian-born)
General Notes:	1. CCHS data is based on representative sample which is then extrapolated to the overall population. 2. Excludes pregnant women, lactating women, persons less than 3 feet tall or greater than 6 feet 11 inches. 3. In the CCHS, the Territories are excluded from income analysis

Screening

Self-Reported Cervical Cancer Screening

Definition:	Percentage of women aged 21–69 who had at least a Papanicolau (Pap) smear in the past 3 years
Measurement Timeframe:	2008
Data Source:	Canadian Community Health Survey
Denominator:	Total number of women aged 21–69 (excluding women who have had a hysterectomy)
Numerator:	Total number of women aged 21–69 reporting having had a Pap test in the past 3 years
CCHS Variables:	• Have you ever had a PAP smear test? • When was the last time? • Have you had a hysterectomy?
Stratification Variables:	• Household income quintile • Geography • Immigration status (in Canada <10 years , in Canada 10+ years, Canadian-born)
General Notes:	1. This indicator is presented for 2008 as data are not available for all provinces/territories in later survey cycles. 2. CCHS data is based on representative sample which is then extrapolated to the overall population. 3. In the CCHS, the Territories are excluded from income analysis

Self-Reported Breast Cancer Screening—Asymptomatic

Definition:	Percentage of asymptomatic females aged 50-69 receiving a mammogram within the past 2 years, where asymptomatic is defined as: Respondents who indicated going for a mammogram for any of the following reasons: •Family history; Regular check-up/routine screening; Age; HRT And not for any of the following reasons: •Lump; Breast problem; Follow-up to breast cancer treatment; Other
Measurement Timeframe:	2008
Data Source:	Canadian Community Health Survey
Denominator:	Total number of asymptomatic females aged 50-69
Numerator:	Asymptomatic females aged 50-69 who indicated going for a mammogram within the past 2 years.
CCHS Variables	• Ever had a mammogram • Reasons for having mammogram (mark all that apply): Family history; Routine screen; Age; HRT; Lump; Follow-up to breast cancer treatment; Breast problem; Other • Last time respondent had undergone a mammogram
Stratification Variables:	• Household income quintile • Geography • Immigration status (in Canada <10 years , in Canada 10+ years, Canadian-born)
General Notes:	1. This indicator is presented for 2008 as data are not available for all provinces/territories in later survey cycles. 2. CCHS data is based on representative sample which is then extrapolated to the overall population. 3. In the CCHS, the Territories are excluded from income analysis

Colorectal Cancer Screening—Asymptomatic

Definition:	Percentage of asymptomatic individuals aged 50–74 who are up-to-date with their colorectal cancer screening where up-to-date is defined as having had an FOBT in the past two years and/or sigmoidoscopy/colonoscopy in the past five years and asymptomatic is defined as: Respondents who reported having a CRC screening test for any of the following reasons: • Family history; Regular check-up/routine screening; Age; Race And not for any of the following reasons: • Follow-up of problem; Follow-up of colorectal cancer treatment; Other
Measurement Timeframe:	2008
Data Source:	Canadian Community Health Survey
Denominator:	Total number of asymptomatic individuals aged 50–74
Numerator:	Number of asymptomatic individuals aged 50–74 reporting having had an FOBT within the past 2 years and/or a colonoscopy/sigmoidoscopy within the past 5 years
CCHS Variables:	• Have you ever had an FOBT test? When was the last time? Why did you have it? • Have you ever had a colonoscopy or sigmoidoscopy? When was the last time? Why did you have it?
Stratification Variables:	• Household income quintile • Geography • Immigration status (in Canada <10 years , in Canada 10+ years, Canadian-born)
General Notes:	1. This indicator is presented for 2008 as data are not available for all provinces/territories in later survey cycles. 2. CCHS data is based on representative sample which is then extrapolated to the overall population. 3. In the CCHS, the Territories are excluded from income analysis

Diagnosis and outcomes

Wait time: Abnormal Breast Screen to Resolution

Definition	Time (in weeks) from abnormal breast screen to resolution (date of definitive diagnosis) for women aged 50-69: (a) requiring a tissue biopsy, and (b) not requiring a tissue biopsy. Definitive diagnosis date is the date of the last test before 6 months
Measurement timeframe	2007-2008
Data Source	Canadian Breast Cancer Screening Database (CBCSD)
Measure	Median (50th percentile) and 90th percentile time (in weeks) from date of abnormal breast screen to date of definitive diagnosis for women aged 50-69: a) requiring a tissue biopsy b) not requiring a tissue biopsy
Stratification variables*	• Neighbourhood income quintile (sample restricted to urban areas only) • Geography
Provinces/Territories included in indicator	BC, AB, SK, MB, ON, NS, NB, PE, NL, NWT
General Notes	1. Excludes cases detected by clinical breast exam alone 2. Excludes cases with missing test type, test date, date of diagnosis, final diagnosis or those lost to follow-up 3. Excludes Quebec as test date and date of diagnosis are not collected 4. Excludes cases with missing income information 5. Definitive diagnosis date excludes tests beyond 6 months post screen. 6. Based on total screens in 2007-2008, and may include women screened twice within this time period. 7. Tissue biopsy refers to core or open biopsy (with or without image guidance) and does not include fine needle aspiration (FNA). 8. Excludes the Yukon Territories and Nunavut. The Yukon does not submit records to the CBCSD and Nunavut has not developed an organized breast screening program but provides opportunistic screening.

Proportion of Women Receiving an Abnormal Breast Screen Result who Waited within Target Time for Resolution

Definition	Proportion of women receiving an abnormal breast screen result who waited within target time for resolution (date of definitive diagnosis): (a) 7 weeks for women requiring a tissue biopsy, (b) 5 weeks for women not requiring a tissue biopsy
Measurement timeframe	2007-2008
Data Source	Canadian Breast Cancer Screening Database (CBCSD)
Denominator	Total number of women aged 50-69 who had an abnormal breast screen
Numerator	(a) Number of women aged 50-69 who had an abnormal screen requiring a tissue biopsy, who received resolution within 7 weeks (b) Number of women aged 50-69 who had an abnormal screen not requiring a tissue biopsy, who received resolution within 5 weeks.
Stratification variables	• Neighbourhood income quintile (sample restricted to urban areas only) • Geography
Standards/Guidelines	The Canadian target is ≥90% of abnormal screens will be resolved within 5 weeks if no tissue biopsy is required and ≥90% within 7 weeks if tissue biopsy is required.
Provinces/Territories included in indicator	BC, AB, SK, MB, ON, NS, NB, PE, NL, NWT
General Notes	1. Excludes cases detected by clinical breast exam alone 2. Excludes cases with missing test type, test date, date of diagnosis, final diagnosis or those lost to follow-up 3. Excludes Quebec as test date and date of diagnosis are not collected 4. Excludes cases with missing income information 5. Definitive diagnosis date excludes tests beyond 6 months post screen. 6. Based on total screens in 2007-2008, and may include women screened twice within this time period. 7. Tissue biopsy refers to core or open biopsy (with or without image guidance) and does not include fine needle aspiration (FNA). 8. Excludes the Yukon Territories and Nunavut. The Yukon does not submit records to the CBCSD and Nunavut has not developed an organized breast screening program but provides opportunistic screening.

Stage Distribution

Definition	Distribution of stage at diagnosis among stageable incident cases for which data are available in provincial cancer registries for breast, colorectal, lung and prostate
Measurement timeframe	2010 and 2011 diagnosis years combined
Data Sources	Provincial cancer agencies
Denominator	Total number of stageable incident cases Exclusions: • Age (at diagnosis) 0 – 17 • Non melanoma skin cancer (M8050-8110 with site code C44.0 to C44.9) • Appendix C18.1 for Colorectal reporting • For reporting by site - Lymphoma codes M-95 to M-98, sarcoma codes– 8800/3
Numerator	Total number of stageable* incident cases by stage at diagnosis (stage 0 through to stage IV, unknown, not available) in the provincial cancer registry
Stratification variables (See Appendix for definitions)	• Neighbourhood income quintile (sample restricted to urban areas only) • Geography • Immigrant density
Provinces/Territories included in indicator	BC, AB, SK, MB, ON, NB, PE, NL, NS
Specific notes	AB: Colorectal Stage IV have been included in Stage IVNOS, Lung Stage IINOS, IIINOS are actually Stage II and Stage III respectively. BC: All cancers only include 5 cancer sites: Breast, Cervix, Colorectal, Lung and Prostate and not all Stage 0 collected. NL: Lung cancer staged I, II or III were entered under the NOS category. Colorectal Stage IV were entered under Stage IVNOS.
General Notes	1. *Stageable incident cases per AJCC Cancer Staging manual, 7th edition 2. NOS: if unable to split out A, B and C, please report under the NOS category for that stage 3. Stage 0: includes both in situ and behavior code 3 (malignant) 4. Unknown: cases for which there is insufficient information to ascertain a definitive stage 5. Not available: cases for which stage data is not available or invalid

Stage-Specific Incidence Rates

Definition	The incidence rate within cancer stage (grouped into early, intermediate and advanced stage cancers) for breast, lung, colorectal and prostate cancer. Incidence rate is defined as the number of cases of cancer (malignant neoplasms) newly diagnosed during a year, per 100,000 people at risk.
Measurement timeframe	Cancer Stage: 2010 and 2011 diagnosis years combined Age-Standardized Incidence Rate: 2007
Data Sources	Cancer Stage: Provincial cancer registry Age-Standardized Incidence Rate: Statistics Canada, Canadian cancer Registry
Methodology	See Exclusions under Stage Distribution in the technical appendix Stage-Specific Incidence rates were estimated by multiplying the percent of early, intermediate and advanced stage cancers within each stratum (income, geography) by the age-standardized incidence rate of that stratum
Stratification variables (See Appendix for definitions)	• Neighbourhood income quintile (For cancer stage, the sample was restricted to urban areas only) • Geography
Province-specific notes	See Province-Specific Notes under Stage Distribution in the technical appendix
General Notes	1) See General Notes under Stage Distribution in the technical appendix 2) Early, intermediate and advanced stage are defined as follows: **breast cancer** - early (stage 1), intermediate (stage 2) and advanced (stages 3, 4); **lung cancer** - early (stages 1, 2, 3A) and advanced (stages 3B, 3, 4); **colorectal cancer** - early (stages 1, 2), intermediate (stage 3) and advanced (stage 4); and **prostate cancer** - early (stage 1), intermediate (stage 2) and advanced (stages 3, 4). 3) Stage-specific incidence rates are estimated using different data sources and different years of data, as noted above. 4) For income, stage distribution is based on urban Canada only for provinces submitting data, whereas age-standardized incidence rates are based on all of Canada 5) Stage distribution is based on data from 9 provinces (excluding QC and the Territories) whereas age-standardized incidence rates are based on all provinces and Territories

Age-standardized incidence rates

Definition	The incidence rate that would have occurred if the age distribution in the population of interest was the same as that of the standard, where incidence rate is defined as the number of cases of cancer (malignant neoplasms) newly diagnosed during a year, per 100,000 people at risk
Measurement Timeframe	2007
Data Sources	Canadian Cancer Registry (CCR) Database (annual file, release date 2011) – cancer incidence data Demography Division of Statistics Canada – population estimates
Numerator	Number of new cancer cases for 1) breast (female), 2) colorectal, 3) lung and 4) prostate (male) cancer
Denominator	1) Annual female population (for breast) estimate in hundreds of thousands 2) and 3) Annual population estimates in hundreds of thousands 4) Annual male population (for prostate) estimate in hundreds of thousands
Stratification Variables (See Appendix for definitions)	• Neighbourhood income quintile • Geography
Age standardization	Direct method using the 1991 Canadian Census population
Included Population	All ages
General Notes	1. World Health Organization, International Classification of Diseases for Oncology, Third Edition (ICD-O-3) and the International Agency for Research on Cancer (IARC) rules for determining multiple primaries sites were used: colorectal (ICD-O-3: C18.0 to C18.9, C19.9, C20.9, C26.0), lung and bronchus (ICD-O-3: C34.0 to C34.9), female breast (ICD-O-3: C50.0 to C50.9), prostate (ICD-O-3: C61.9). The four categories are excluding morphology types M-9050 to M-9055, M-9140, and M-9590 to M-9989.

Age-standardized mortality rates

Definition	The mortality rate that would have occurred if the age distribution in the population of interest was the same as that of the standard, where mortality rate is defined as the number of deaths due to cancer (malignant neoplasms) in a year per 100,000 people at risk
Measurement Timeframe	2007
Data Sources	Canadian Vital Statistics – Death Database (annual file) – cancer mortality data, Demography Division of Statistics Canada – population estimates.
Numerator	Number of deaths from cancer 1) breast (female), 2) colorectal, 3) lung and 4) prostate (male) cancers
Denominator	1) Annual female population (for breast) estimate in hundreds of thousands 2) and 3) Annual population estimates in hundreds of thousands 4) Annual male population (for prostate) estimate in hundreds of thousands
Stratification Variables (See Appendix for definitions)	Neighbourhood income quintile Geography
Age-standardization	Direct method using the 1991 Canadian Census population
Included Population	All ages
General Notes	After the year 1999, causes of death were coded according to the World Health Organization (WHO), International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10): All Cancers (ICD-10: C00-C97), colorectal (ICD-10:C18-C20, C26), lung (ICD-10 : C34), female breast (ICD-10: C50) and prostate cancer (ICD-10: C61).

Treatment

Radiation Therapy (RT) Utilization Rates

Definition	Percentage of cancer cases receiving radiation therapy within 2 years of diagnosis
Measurement timeframe	2010 diagnosis year
Data Sources	Provincial cancer registry/linkage to cancer centre treatment data
Denominator	Total number of cancer incident cases diagnosed during 2010 Inclusions: • All disease site & morphology codes used for reporting incident cases by disease site • All cases with behaviour code 3 • Treatments associated with brachytherapy Exclusions: • Age (at diagnosis) 0 – 17 • Non melanoma skin cancer (M8050-8110 with site code C44.0 to C44.9) • Benign, in-situ and borderline cases
Numerator	Total number of cancer incident cases diagnosed during 2010 who have received RT within 2 years of diagnosis Inclusions: • RT Start Date – Diagnosis Date <=730 days • All cases who have received RT regardless of treatment intent •
Stratification variables (See Appendix for definitions)	• Neighbourhood income quintile (sample restricted to urban areas only) • Geography • Immigrant density • One-way travel time (in minutes) from place of residence to closest radiation treatment centre
Provinces/Territories included in indicator	BC, AB, SK, MB, NB, PE, NL, NS
Province-specific notes	Data for BC excludes majority of radiation therapy to sites other than the primary tumour site.
General Notes	1. The “incident case” is at the patient /primary disease level. One person with two separate primaries would be treated as two incident cases

Radiation Therapy (RT) Wait Times: Ready to Treat to Start of Radiation Therapy

Definition	1. The median and 90th percentile elapsed time from ready to treat to start of radiation therapy, measured in days 2. The percentage of radiation therapy cases for which the above wait time was within target timeframes The above is reported for all invasive cancers, lung and prostate cancer
Measurement Timeframe	2012 treatment year
Data Sources	Provincial cancer registry/linkage to cancer centre treatment data
Stratification Variables (See Appendix for definitions)	• Neighbourhood income quintile (sample restricted to urban areas only) • Geography • Immigrant density • One-way travel time (in minutes) from place of residence to nearest radiation treatment facility
Included Population	All cancer patients receiving radiation therapy in 2012 who have wait time data collected as consistent with the specifications of this indicator. <u>Inclusions:</u> • All behaviour codes
Measures	1. Median and 90th percentile wait time (days) 2. Percentage of patients starting treatment within target timeframe (4 weeks after being deemed 'ready to treat').
Provinces/Territories included in indicator	AB, BC, MB, NB, NS, PE, SK
Province-specific notes	SK: the site classification for this indicator was by treatment, not by diagnosis site. MB: some patients have multiple start dates so they will be counted more than once and included all wait times to provide the correct denominator for the percentage.
General Notes	1. Disease Site and Morphology Codes: In order to identify colorectal cancer, lung cancer, prostate cancer and all cancer, please use whatever disease site and morphology codes are used within your registry for reporting purposes for reporting incident cases by disease site. 2. The definition of "Ready to Treat" is known to vary by province. Please see the table below for the definition used by your province, collected in 2012. 3. Of note for breast cancer data, if the province obtains this data from a wait times database as opposed to a registry, then the breast cancer cases were to be included per the database definition.

	Province	Definition
Provincial Definitions of "Ready to Treat" *	AB	The date when the patient is physically ready to commence treatment.
	BC	The date at which both oncologist and patient agree that treatment can commence. Being ready to treat requires that all diagnostic tests and procedures required to assess the appropriateness of, indications for, and fitness to undergo radiation therapy are complete.
	MB	The date when a decision has been made by the radiation oncologist and is agreed to by the patient that radiation therapy is appropriate and should commence AND the patient is medically ready to start treatment AND the patient is willing to start treatment.
	NB	The date when any planned delay is over and the patient is ready to begin treatment from both a social/personal and medical perspective.

	Province	Definition
	NL	The date when all pre-treatment investigations and any planned delay are over, and the patient is ready to begin the treatment process from both a social/ personal and medical perspective.
	NS	The date when all pre-treatment investigations and any planned delay are over, and the patient is ready to begin the treatment process from both a social/personal and medical perspective. Nova Scotia did not have a ready to treat date until February 2010; a proxy date was used prior to this time.
	ON	The time from when the specialist is confident that the patient is ready to begin treatment to the time the patient receives treatment.
	PE	The date when all pre-treatment investigations and any planned delay are over, and the patient is ready to begin the treatment process from both a social/ personal and medical perspective.
	QC	At consultation, the radiation oncologist enters the date at which the patient will be ready to treat on a formulary requesting treatment.
	SK	The date when the patient is ready to receive treatment, taking into account clinical factors and patient preference. In the case of radiation therapy, any preparatory activities (e.g., simulation, treatment planning, dental work) do not delay the ready to treat date.

Mastectomy/Breast Conserving Surgery Rates

Definition	The percentage of surgical resections among women with unilateral invasive breast cancer that are mastectomies.
Data Sources* and Measurement Timeframe	• CIHI: Hospital Morbidity Database (FY2007/08- FY2011/12), National Ambulatory Care Reporting System (FY2007/08-FY2011/12). • Alberta Health and Wellness: Alberta Ambulatory Care Reporting System (FY2007/08-FY2009/10) • Statistics Canada: Postal Code Conversion File (PCCF+).
Denominator	Women with unilateral invasive breast cancer who received breast conserving surgery and/or a mastectomy during measurement timeframe.
Numerator	Women in the denominator who received a mastectomy first as well as women who received breast conserving surgery first followed by a mastectomy within one year
Stratification Variables	• Neighbourhood income quintile (sample restricted to urban areas only) • Geography • Immigrant density (excludes QC) • One-way travel time (in minutes) from place of residence to closest radiation treatment centre (excludes QC)
Included population	Ages 18+ years
Province-specific notes	*Data for AB are limited to FY2007/08-2009/10 due to major data limitations such as availability of day surgery data. Alberta day surgeries started to report to NACRS in FY2010.
Provinces/Territories excluded from indicator	The Territories are excluded from the income analysis due to small sample size QC is excluded from analyses by immigrant density and travel time
General Notes	1. Breast cancer surgical Intervention coded anywhere in the abstract AND location attribute in Right, Left, Bilateral. a. **ICD10CA:** CODING_CLASS='0' b. Breast Conserving Surgery (BCS): i. 1.YM.87.^^ Excision partial, breast. ii. 1.YM.88.^^ Excision, partial, breast with reconstruction. c. Mastectomy: i. 1.YM.89.^^ Excision, total, breast. ii. 1.YM.90.^^ Excision, total, breast with reconstruction. iii. 1.YM.91.^^ Excision, radical, breast. iv. 1.YM.92.^^ Excision, radical, breast with reconstruction. 2. Breast cancer Diagnoses Code coded as **MRDx**. **ICD10 CA:** CODING_CLASS='0' a. Primary Malignant Neoplasm: C50.00, C50.01, C50.09, C50.10, C50.11, C50.19, C50.20, C50.21, C50.29, C50.30, C50.31, C50.39, C50.40, C50.41, C50.49, C50.50, C50.51, C50.59, C50.60, C50.61, C50.69, C50.80, C50.81, C50.89, C50.90, C50.91, C50.99
Distance Analysis	The distance analysis was performed using the 'closest facility' feature of the

	Network Analyst extension of ESRI's ArcGIS 10. This feature can calculate travel time for a set of origins (patients) and the closest destinations (hospitals), with travel time being a function of posted speed limit and road length. The road network data used was produced by Statistics Canada, with speed limit assignments carried out by Earth-To-Map GIS Inc., a GIS consulting company located in Ottawa. Patients and hospitals are mapped (geocoded) using postal codes, with latitude and longitude derived from the PCCF+ Version 5G, which provides automated geographic coding based on Statistics Canada's postal code conversion file (PCCF). Exclusion Criteria: i. The PCCF+ does not produce a latitude and longitude for certain postal codes. ii. The postal code is mapped to a location greater than 2km from the road network. iii. An incomplete (or fragmented) road network between the patient and hospital prevented a complete travel time calculation (only in more remote regions).

Permanent Colostomy/Ileostomy Rates

Definition	Percentage of individuals with a diagnosis of rectal cancer who had a rectal resection with a permanent colostomy/ileostomy
Measurement Timeframe:	Fiscal years 2007/08 to 2011/12
Data Source:	• CIHI - Hospital Morbidity Database (HMDB) • Statistics Canada - Postal Code Conversion File (PCCF+)
Numerator	Number of unique individuals with a diagnosis of rectal cancer, and who had a rectal resection with either (A) a permanent colostomy/ileostomy; or (B) a temporary ileostomy/colostomy; or (C) no colostomy within the 5 year period. Notes: Groups A, B and C are **mutually exclusive**. Each individual can only belong to one of the three groups. 1) If an individual underwent multiple resections over the 5-year period, and if the initial procedure is a permanent procedure, then the individual is assigned to Group A (patient with permanent colostomy/ileostomy) 2) If an individual underwent multiple resections over the 5-year period, and the initial procedure is a temporary procedure, then the individual is assigned to Group B (patient with temporary colostomy/ileostomy) 3) If an individual underwent multiple resections over the 5-year period, and in the initial resection no permanent or temporary procedure was performed, then the individual is assigned to Group C (patient with no colostomy/ileostomy)
Denominator	Total number of unique individuals with a diagnosis of rectal cancer and who had at least one rectal resection (Total of Group A, B and C)
Stratification Variables:	• Neighbourhood income quintile (sample restricted to urban areas only) • Geography • Immigrant density (excludes QC) • One-way travel time (in minutes) from place of residence to the closest hospital performing surgery (includes hospitals performing at least 5 rectal resections over the 5 year period) (excludes QC)
Included population	Ages 18+ years
Provinces/Territories excluded from indicator	QC is excluded from analyses by immigrant density and travel time The Territories are excluded from the income, geography and travel time analyses due to small sample size
General notes	-ICD-10-CA diagnosis code for rectal cancer is C20 -Permanent colostomy/ileostomy, temporary colostomy/ileostomy and no colostomy/ileostomy are defined using the following CCI procedure codes**:** **GROUP A - Permanent colostomy or ileostomy:**

	1.NQ.89.RS - Excision total, rectum, abdominal [anterior] approach stoma formation with distal closure *OR* *1.NQ.89.LH - Excision total, rectum, abdominoperineal approach stoma formation with distal closure* *OR* *1.NQ.89.AB - Excision total, rectum, combined endoscopic [abdominal] with perineal approach stoma formation with distal closure* *OR* *1.NQ.89.RS-XX-G- Excision total, rectum, abdominal [anterior] approach continent ileostomy formation (*ileostomy is done, not colostomy)* *OR* *1.NQ.89.LH-XX-G- Excision total, rectum, abdominoperineal approach continent ileostomy formation (*ileostomy is done, not colostomy)* **GROUP B - Temporary colostomy or ileostomy** *(1.NM.77.^^* OR 1.NK.77.EN OR 1.NK.77.RR) *AND 1.NQ.87.RD* *OR* *(1.NM.77.^^* OR 1.NK.77.EN OR 1.NK.77.RR) *AND 1.NQ.87.DF* *OR* *(1.NM.77.^^* OR 1.NK.77.EN OR 1.NK.77.RR) *AND 1.NQ.87.DE* *OR* *(1.NM.77.^^* OR 1.NK.77.EN OR 1.NK.77.RR) *AND 1.NQ.89.SF-XX-G OR* *(1.NM.77.^^* OR 1.NK.77.EN OR 1.NK.77.RR) *AND 1.NQ.89.KZ-XX-G* *In the same operative episode** *OR* *1.NQ.87.TF* *OR* *1.NQ.87.DX* **An operative episode is defined as a patient's visit to an intervention location (e.g. trip to the OR) where one or more interventions may take place.* **GROUP C - No colostomy or ileostomy** *1.NQ.87.LA OR 1.NQ.87.DA OR 1.NQ.87.RD OR 1.NQ.87.DF OR 1.NQ.87.DE OR 1.NQ.87.PF*
Distance Analysis	The distance analysis was performed using the 'closest facility' feature of the Network Analyst extension of ESRI's ArcGIS 10. This feature can calculate travel time for a set of origins (patients) and the closest destinations (hospitals), with travel time being a function of posted speed limit and road length. The road network data used was produced by Statistics Canada, with speed limit assignments carried out by Earth-To-Map GIS Inc., a GIS consulting company located in Ottawa. Patients and hospitals are mapped (geocoded) using postal codes, with latitude and longitude derived from the PCCF+ Version 5G, which provides automated geographic coding based on Statistics Canada's postal code conversion file (PCCF).

	Exclusion Criteria: iv. The PCCF+ does not produce a latitude and longitude for certain postal codes. v. The postal code is mapped to a location greater than 2km from the road network. vi. An incomplete (or fragmented) road network between the patient and hospital prevented a complete travel time calculation (only in more remote regions).

Research

Adult Clinical Trial Participation Ratio

Definition	The ratio of the total number of all patients (>= 19 years) newly enrolled in cancer-related therapeutic trials or clinical research studies in 2012 to the projected number of new incident cancer cases in 2012 for all invasive cancers
Measurement timeframe	2011 (for denominator) and 2012 (for numerator)
Data Sources	Provincial cancer registry
Denominator	Number of invasive incident cancer cases in 2011 Exclusion: In situ cases
Numerator	Number of new incident cancer patients (>=19 years) enrolled in cancer-related therapeutic trials or clinical research at provincial cancer centres during 2012
Stratification variables	• Neighbourhood income quintile (sample restricted to urban areas only) • Geography • Immigrant density
Provinces/Territories included in indicator	AB, BC, MB, PE, SK, NB
Province-specific notes	Data for AB are accrual based, but only includes cases that could be linked to the Alberta Cancer Registry.

Relative Survival

Relative Survival Ratio

Definition	Relative survival is the ratio of the observed survival for a group of cancer patients (malignant neoplasms) to the expected survival for members of the general population who have the same main factors affecting survival (sex, age, place of residence) as the cancer patients (referred to as the comparison population).
Measurement timeframe	Patients with follow-up in 2004 to 2006
Data Sources	Canadian Cancer Registry (July 2010 with death clearance complete up to 2006) Provincial life tables (Statistics Canada) Urban Canada by income quintile life tables (Statistics Canada)
Denominator	Expected survival of comparison population that was alive for 1, 2, 3, 4 and 5 years for patients with follow-up in 2004 to 2006.
Numerator	Observed survival of cancer patients (aged 15–74) who were alive for 1, 2, 3, 4 and 5 years after diagnosis for patients with follow-up in 2004 to 2006
Population exclusions	• Age < 15 or >74 are excluded • Subjects diagnosed through autopsy only or death certificate only • Subjects with an unknown year of birth or death
Age Standardization	Direct method by weighing age-specific estimates for a given cancer to the age distribution of persons diagnosed with cancer during 1992 to 2001
Stratification Variables:	income (see Canadian Census 2006 stratification variables)
General Notes	1. World Health Organization, International Classification of Diseases for Oncology, Third Edition (ICD-O-3) and the International Agency for Research on Cancer (IARC) rules for determining multiple primaries sites were used: colorectal (ICD-O-3 C18.0 to C18.9, C19.9, C20.9, C26.0), lung and bronchus (ICD-O-3 C34.0 to C34.9), female breast (ICD-O-3 C50.0 to C50.9) and prostate (ICD-O-3 C61.9). The four categories are excluding morphology types M-9050 to M-9055, M-9140, and M-9590 to M-9989. Included are all invasive sites and *in situ* for bladder. 2. "Canada" represents all provinces and territories, minus Quebec. Data from Quebec have been excluded, in part, because the method of ascertaining the date of cancer diagnosis differs from the method used by other registries and because of issues in correctly ascertaining the vital status of cases. 3. Survival estimates from Newfoundland and Labrador are included in the national average but are not shown in this Report. In the years under study, there was a known underreporting of cancer cases in Newfoundland and Labrador. There is likely to be some overestimation of survival for this province as the survival of such 'missed' cases is generally less favourable than that of cases in the registry population. Relative survival was calculated using the period method and all primary cancers. 4. Expected survival proportions were derived from sex-specific complete

	provincial life tables produced by Statistics Canada, using the Ederer II approach. 5. Abridged life tables with 5-year age group for 1991, 1996 and 2001 of urban Canada by income quintile were produced by Statistics Canada and then extended to complete life tables with each single year of age using Elandt-Johnson method. Complete life tables between any 2 census years were estimated by using linear interpolation.