



INSIGHT ON CANCER

news and information on *colorectal cancer*

HIGHLIGHTS

- Colorectal cancer is second only to lung cancer as a cause of cancer deaths in Ontario
- Ontario's incidence of colorectal cancer is among the highest in the world
- Men have higher rates of colorectal cancer incidence and mortality than women
- Incidence of colorectal cancer has risen slightly since 1997, while mortality continues to fall
- Survival for colorectal cancer has improved steadily since 1981
- Colorectal screening in Ontario is at low levels for every screening method
 - Cancer Care Ontario is leading an evaluation of the best way to recruit people for screening
- Risk factors include physical inactivity, obesity, smoking and family history



Insight on Cancer is a series of joint Cancer Care Ontario and Canadian Cancer Society (Ontario Division) publications, designed to provide up-to-date information for health professionals and policy-makers about cancer and cancer risk factors in the province.

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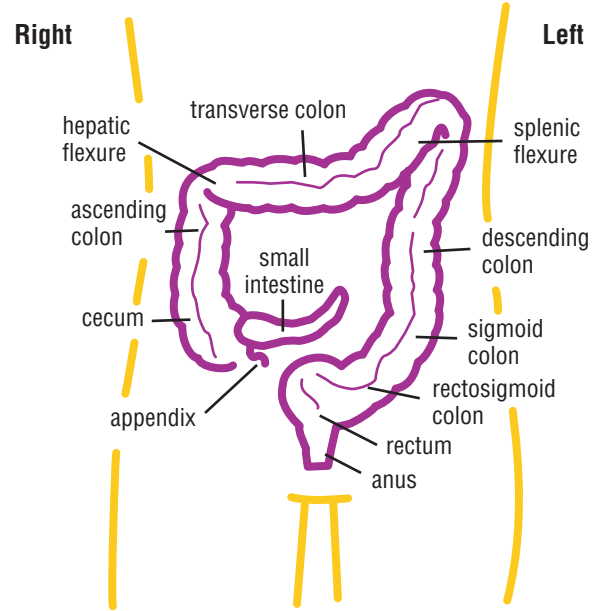


COLORECTAL CANCER DEFINED

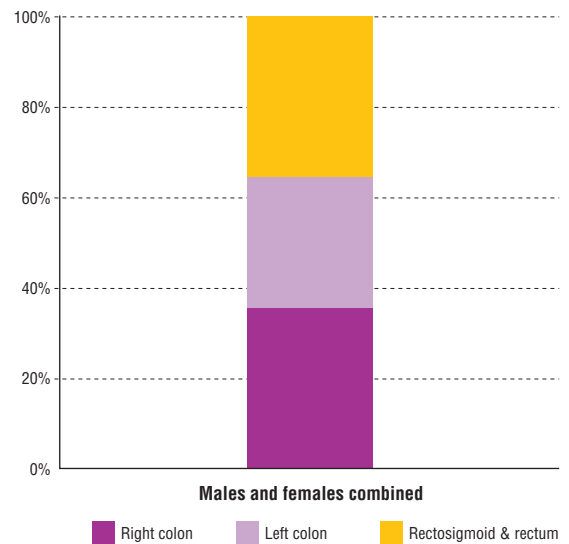
Incidence data in this monograph include newly diagnosed cases of cancer of the colon, rectosigmoid junction, rectum and anus (excluding anal margin and skin). Mortality data additionally include deaths from unspecified intestinal tract cancer, since most deaths so registered are actually from colorectal cancer and excluding them would underestimate colorectal mortality.

Most colorectal cancers are adenocarcinomas and arise from benign adenomatous polyps on the inner wall of the colon or rectum. The colon and rectum comprise the last 180–210 cm (6–7 feet) of the intestinal tract, and store waste until it passes out of the body as fecal material. The right colon, which connects with the small intestine, includes the cecum, appendix, ascending colon, hepatic flexure and transverse colon. About 36% of colorectal cancers, when site is specified, are found in this region. The left colon includes the splenic flexure, descending colon and sigmoid colon. Fewer cancers arise in this region, about 28%. The final (and shortest) region, the rectosigmoid and rectum, gives rise to another 36% of colorectal cancers.

(See Glossary for explanation of some terms.)



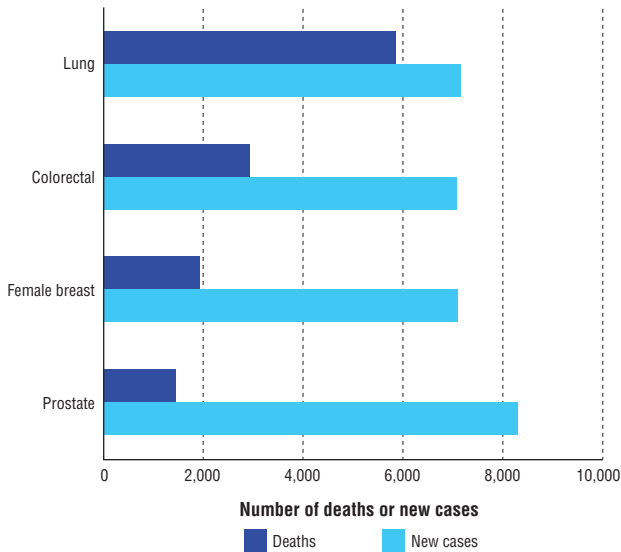
Subsite proportions for colorectal cancer, 2001



Source: Cancer Care Ontario (Ontario Cancer Registry, 2003)

COLORECTAL CANCER IN CONTEXT

Annual number of deaths and new cases for the most common cancers in Ontario, 2001



Source: Cancer Care Ontario (Ontario Cancer Registry, 2003)

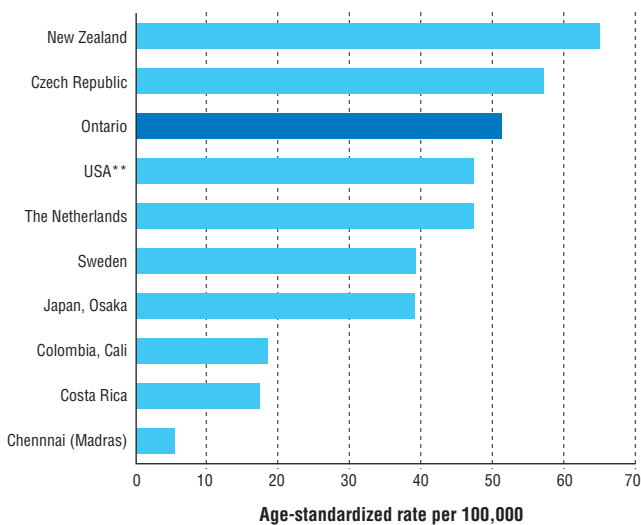
How common is colorectal cancer?

Colorectal cancer is second only to lung cancer among cancer deaths in Ontario, and resulted in 2,914 deaths during 2001. This is more than the 1,869 deaths caused by female breast cancer and the 1,376 caused by prostate cancer.

Colorectal cancer is among the four most common cancers diagnosed in Ontario. The total of 7,070 cases diagnosed during 2001 is close to the 7,155 new cases of lung cancer and 7,073 of female breast cancer.

The **prevalence of colorectal cancer is about 0.3%**; in 2001 approximately 35,000 Ontarians had been diagnosed with colorectal cancer in the preceding 15 years. (See Glossary for terms, data sources and methods.)

Colorectal cancer incidence rates* for selected geographic areas, 1993-1997



Source: Parkin et al., 2002¹

* Standardized to the 1991 Canadian population
 ** "White" population in the 5 states and 4 metropolitan areas in the original Surveillance, Epidemiology and End Results (SEER) Program

Geographic variation

The incidence of colorectal cancer in Ontario is among the highest in the world, along with New Zealand, the U.S. and several European countries. Incidence is lower in Japan and parts of Europe, and even lower in less developed countries.¹

Rates in Canada show an east-to-west gradient, higher in Atlantic Canada and lowest in the western provinces, with Ontario's rates in the middle range.²

Ontario rates of colorectal cancer deaths exceed those of all 50 U.S. states for both males and females.³



A DISEASE OF OLDER MEN AND WOMEN

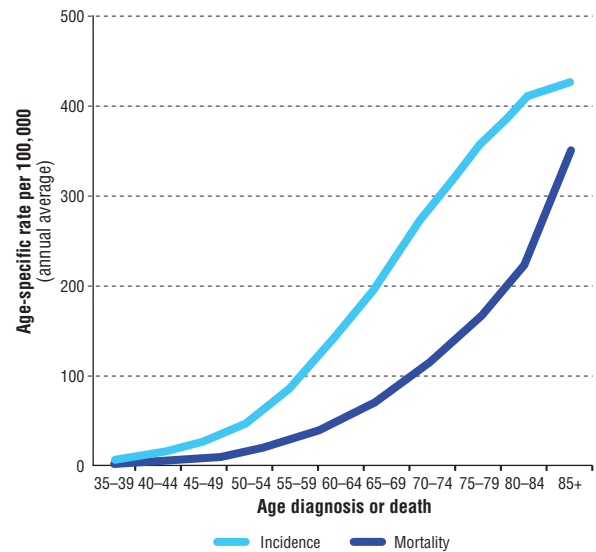
Age at diagnosis

Colorectal cancer is uncommon before age 50 (except for rare hereditary cases), and then increases from 55 per 100,000 in the age group 50–54 to 423 per 100,000 aged 85 and older.

Mortality is much lower and increases less steeply, from 16 per 100,000 in the age group 50–54 to 351 per 100,000 aged 85 and older.

Median age at diagnosis was 70, and median age at death was 74, during the period 1997–2001.

Colorectal cancer incidence and mortality rates by age, 1997-2001

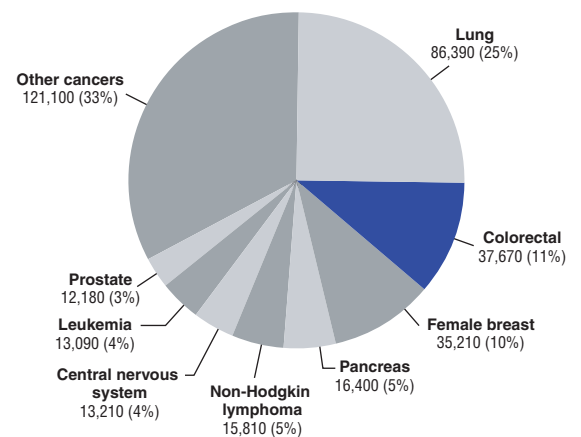


Source: Cancer Care Ontario (Ontario Cancer Registry, 2003)

Potential years of life lost

Colorectal cancer ranks second, behind only lung cancer, for potential years of life lost to cancer (PYLL). Although there are many more deaths from colorectal cancer than from breast cancer, the PYLL is only slightly higher because of older ages at diagnosis.

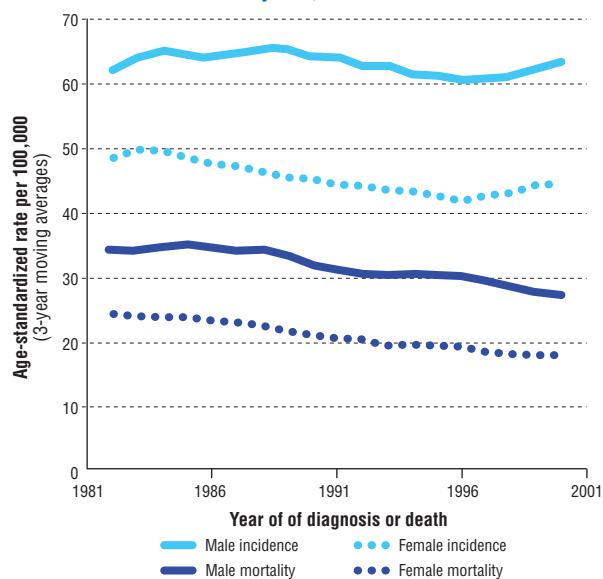
Potential years life lost (PYLL) due to cancer Ontario, 2001



Source: Cancer Care Ontario (Ontario Cancer Registry, 2003) Statistics Canada, 2002⁴

TIME TRENDS

Colorectal cancer incidence and mortality rates by sex, 1981-2001



Source: Cancer Care Ontario (Ontario Cancer Registry, 2003)

Male and female incidence and mortality

Colorectal incidence and mortality are higher for males than for females. Incidence was slightly higher in males and lower in females in 2001 as compared with 20 years earlier. Incidence in males rose slightly, at an average of 1% per year, between 1981 and 1988, fell slightly to 1997 and then rose an average of 2% per year to 2001. Female incidence rates rose slightly after 1997, following a slight steady fall from the early 1980s.

Colorectal cancer mortality fell for both sexes between 1981 and 2001, with a decline of 20% for males and 27% for females.

While favourable dietary changes may explain the falling incidence during the 1980s and early 1990s, there is no obvious explanation for the recent rise. It may be the result of greater use of colonoscopy for screening and/or diagnosis, bringing forward the diagnosis dates for some cases.⁵ An earlier fall in U.S. rates stabilized or reversed in the mid- to late-1990s and then fell again during 1998–2000.⁶ Ontario shows no evidence of a similar very recent decline, perhaps because screening uptake in Ontario is lagging behind that for the U.S.⁷ Incidence trends in most other high-risk countries stabilized or decreased during the mid 1990s.⁸

Falls in mortality may reflect the declining incidence in the 1980s and 1990s, and possibly earlier diagnosis and improvements in treatment. Mortality was declining even in the early 1970s, when incidence was rising.



Anatomic subsites

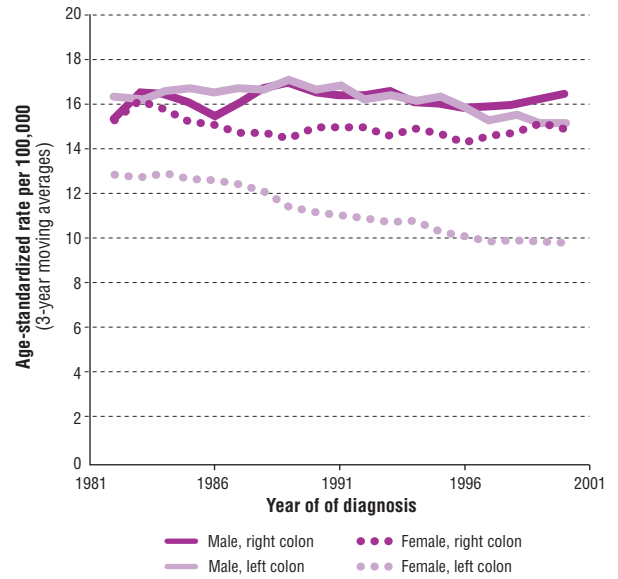
Left-sided colon cancer rates are much lower than right-sided in females, and have been falling an average of 2% per year, while remaining stable in males. A similar decline in left-sided colon cancer incidence has been observed for U.S. females.⁹

Rates for right-sided colon cancers remained stable and similar for both sexes between 1981 and 2001.

The largest difference in anatomic subsites between the sexes is for rectosigmoid and rectal tumours; rates in males are nearly double those in females. Rates for both sexes had fallen slightly by the late 1990s and have risen recently, more abruptly in males and to slightly higher levels than previously.

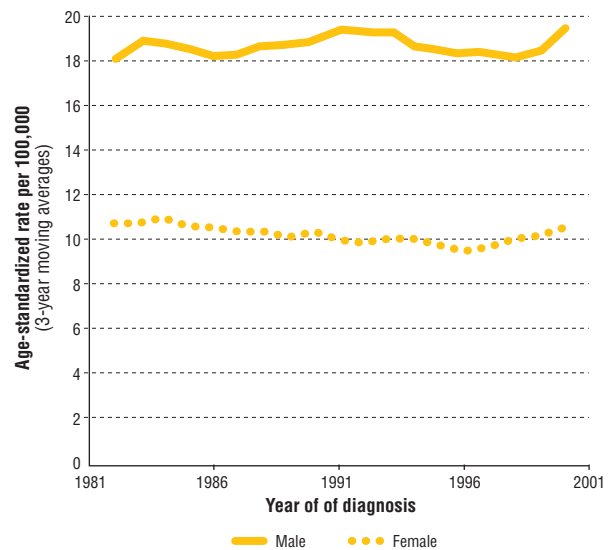
Changes over time in anatomic subsite rates may result partly from changes over time in lifestyle factors (diet and/or physical activity) and/or exposure to carcinogens.^{9,10} Although older people have more right-sided colorectal cancers, the rates shown have been age-standardized to remove the effect of age differences in the population over time and between sexes.

Colorectal cancer incidence rates
right and left colon, by sex, 1981-2001



Source: Cancer Care Ontario (Ontario Cancer Registry, 2003)

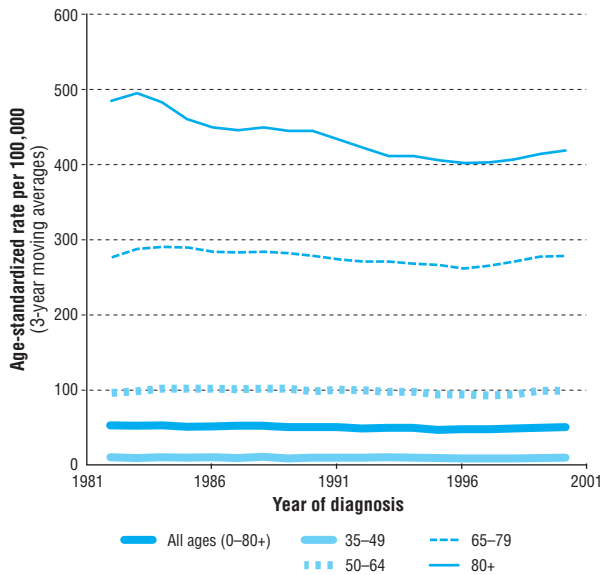
Colorectal cancer incidence rates
rectosigmoid and rectum, by sex, 1981-2001



Source: Cancer Care Ontario (Ontario Cancer Registry, 2003)

TIME TRENDS

**Colorectal cancer incidence rates by age group
males and females combined, 1981-2001**



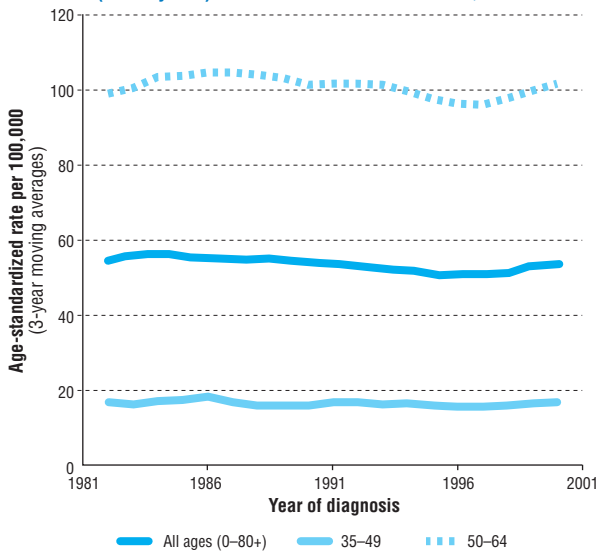
Source: Cancer Care Ontario (Ontario Cancer Registry, 2003)

Incidence by age group

Incidence rates in each age group are higher for men than for women (sex-specific data not shown). Incidence for ages 80+ fell slightly until 1996 and then rose at 2% per year. Rates for ages 65–79 rose slightly after 1996, at less than 2% per year.

Incidence is much lower at ages under 65 (see graph at lower left).

**Colorectal cancer incidence rates by age group
(35-64 years) males and females combined, 1981-2001**



Source: Cancer Care Ontario (Ontario Cancer Registry, 2003)

Incidence: ages 35 to 64

Younger age groups are shown here on a different scale, to better display time trends at these lower rates. Rates for ages 50–64 rose at 2% per year after 1997, following a slight fall over the previous decade. Incidence for ages 35–49 remained low and relatively stable throughout the 1980s and 1990s.

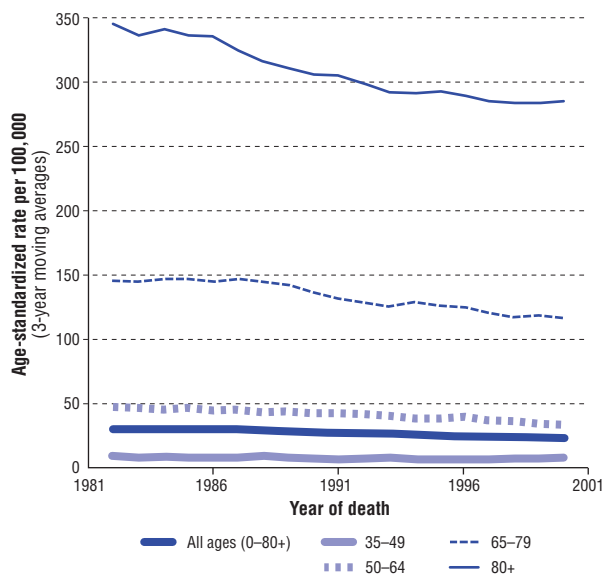


Mortality by age group

The declining mortality seen for all ages combined (see page 6) is also evident for the separate age groups. Mortality for age groups 80+ and 65-79 fell slightly, at an average of 1% per year, across the 1980s and 1990s.

As with incidence, mortality is much lower at ages under 65 (see graph at lower right).

Colorectal cancer mortality rates by age group males and females combined, 1981-2001

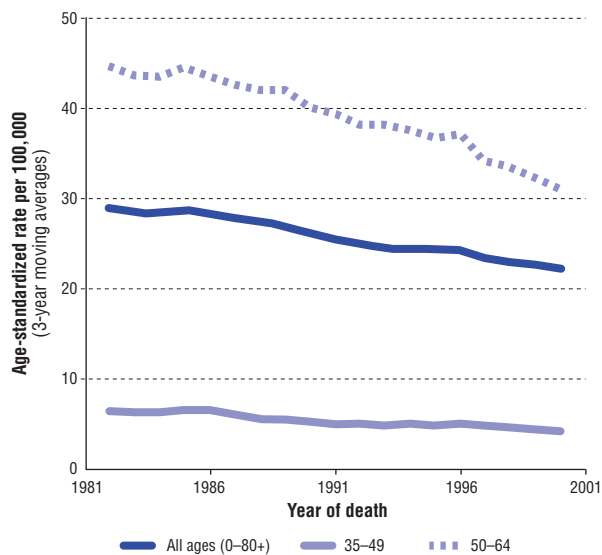


Source: Cancer Care Ontario (Ontario Cancer Registry, 2003)

Mortality: ages 35 to 64

Younger age groups are shown here on a different scale, to better display trends at these lower rates. Mortality rates for ages 50-64 fell an average of 2% per year over the 1980s and 1990s. The rate for ages 35-49 fell an average of 3% per year over those two decades.

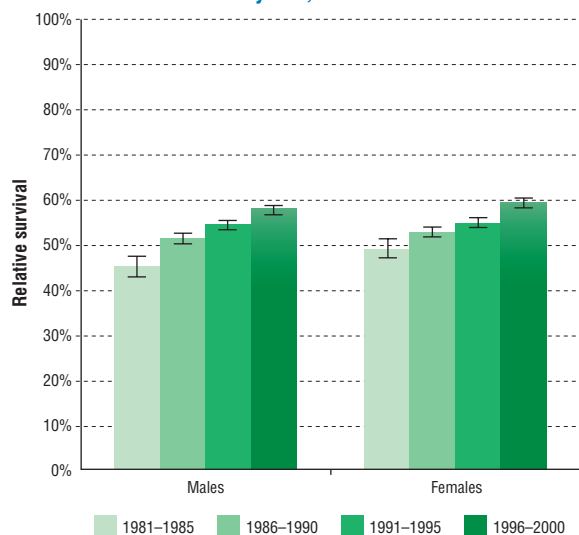
Colorectal cancer mortality rates by age group (35-64 years) males and females combined, 1981-2001



Source: Cancer Care Ontario (Ontario Cancer Registry, 2003)

SURVIVAL

Colorectal cancer 5-year relative survival* by sex, 1981-2000



Source: Cancer Care Ontario (Ontario Cancer Registry, 2003)

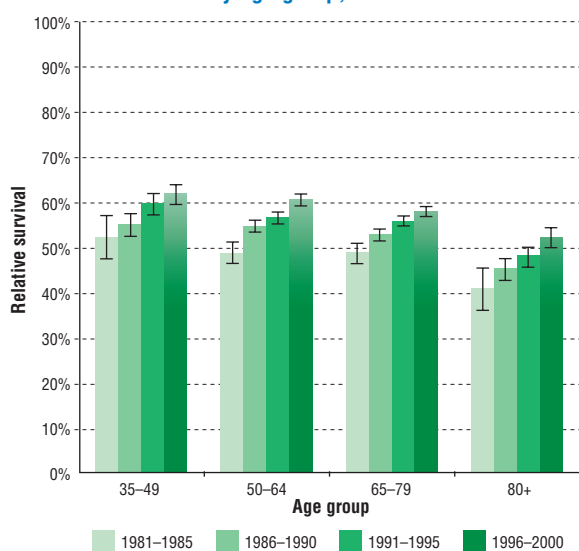
* Using Brenner's period method, which estimates survival of all cases followed up during the specified periods¹³
 † = 95% confidence intervals

Estimated five-year relative survival has improved steadily and significantly over two decades. Survival rose from 45% for males followed during 1981–1985 to 57% for males followed during 1996–2000. The corresponding increase for females was from 49% to 59%.

Survival improved significantly for all four age groups 35 and older over the past 20 years (1981–1985 through 1996–2000). Those aged 80 and over had significantly lower survival than younger groups for every five-year period. Five-year survival for ages 35–49 was significantly higher than for those aged 65 and older in the 1990s.

Disease outcome, including survival, is influenced by factors other than age, including treatment and the presence or absence of other disease. One of the most influential factors is the **stage of disease at time of diagnosis**. Stage 0 (pre-invasive) or Stage I cancer involves only the inner lining of the colon or rectum. Stage II cancer has spread through the wall of the colon or rectum; if it has spread to nearby lymph nodes, it is Stage III. Stage IV cancer has spread to other parts of the body, commonly to the liver and/or lungs.¹¹ Five-year relative survival varies widely according to stage, with U.S. population-based estimates of 96% for Stage I, 87% for Stage II, 55% for Stage III, and 5% for Stage IV.¹² Ontario does not yet collect complete stage information on all cases.

Colorectal cancer 5-year relative survival* by age group, 1981-2000



Source: Cancer Care Ontario (Ontario Cancer Registry, 2003)

* Using Brenner's period method, which estimates survival of all cases followed up during the specified periods¹³
 † = 95% confidence intervals



REGIONAL VARIATION IN ONTARIO

Incidence and mortality

Northwest, Northeast and Southwest regions have incidence significantly above the overall provincial incidence rate of 51.4 per 100,000. Northeast and Southwest regions also have mortality above the overall provincial mortality rate of 22.4 per 100,000. Central East, which includes a high proportion of immigrants from lower-risk countries, has significantly lower incidence and mortality than Ontario as a whole.

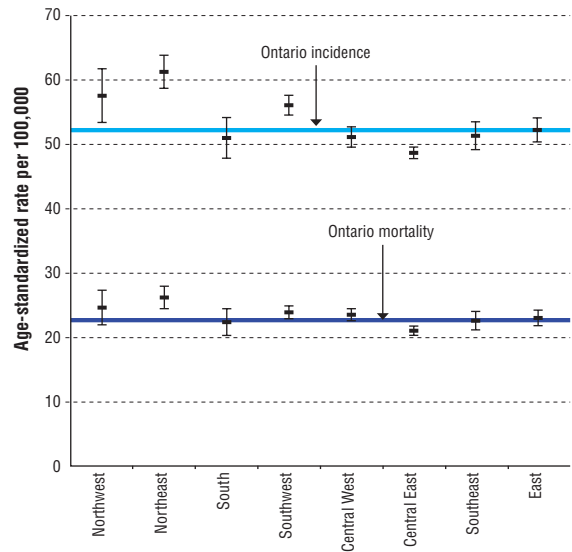


Source: Cancer Care Ontario (Ontario Cancer Registry, 2003) SAS, 1999-2001¹⁴

Survival

Relative survival is significantly poorer only for the Northwest at 51%, compared with 58% for Ontario as a whole.

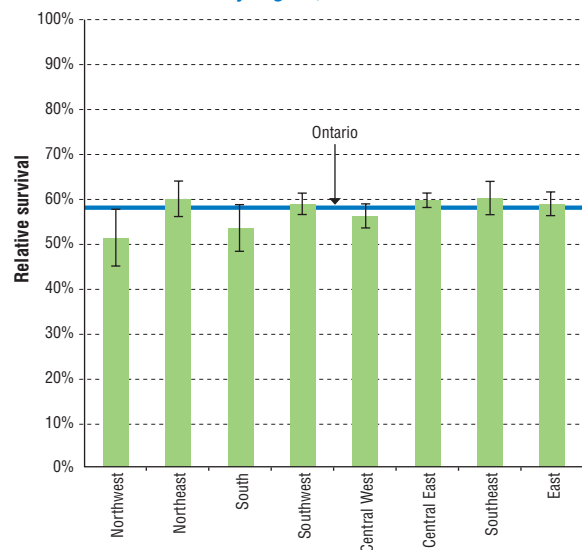
Colorectal cancer incidence and mortality rates by region, 1997-2001



Source: Cancer Care Ontario (Ontario Cancer Registry, 2003)

± = 95% confidence intervals

Colorectal cancer 5-year relative survival* by region, 1996-2000



Source: Cancer Care Ontario (Ontario Cancer Registry, 2003)

* Using Brenner's period method, which estimates survival of all cases followed up during 1996-2000, adjusted for regional differences in age at diagnosis¹³
 ± = 95% confidence intervals

SCREENING

Recommendations for people at normal or average risk

Screening men and women over age 50 who have no symptoms of colorectal disease can lower mortality from colorectal cancer, particularly if it is carried out with quality control and timely follow-up. Screening can also lower incidence, by finding precancerous polyps which are then removed before they develop into cancer.

All screening tests have both risks and advantages. Uncertainty remains about the best test or combination of tests to use, the ideal frequency, and the age at which screening should stop.

Risks associated with screening include anxiety; unnecessary investigations or false reassurance because of the fecal occult blood test's lack of sensitivity and specificity; perforation after sigmoidoscopy (1.4 per 10,000) or colonoscopy (10 per 10,000); bleeding after sigmoidoscopy or colonoscopy.¹⁵

In both Canada and the U.S., expert panels have assessed the evidence in recent years (see table below).^{15,16}

Colorectal cancer screening recommendations for people at average risk

Canadian Task Force on Preventive Health Care ¹⁵		U.S. Preventive Services Task Force ¹⁶
Screening modality	Level of evidence	
Fecal occult blood test (FOBT)	Good evidence to include every 1–2 years in the periodic health examination (PHE) of people over 50	Strong recommendation that clinicians screen men and women aged 50 or older for colorectal cancer
Flexible sigmoidoscopy	Fair evidence to include in PHE of people over 50	Fair to good evidence that several screening methods are effective in reducing mortality from colorectal cancer
FOBT plus flexible sigmoidoscopy	Insufficient evidence to make recommendations about whether only one of or both FOBT and sigmoidoscopy should be performed	Benefits from screening substantially outweigh potential harms, but the quality of evidence, magnitude of benefit, and potential harms vary with each method
Colonoscopy	Insufficient evidence to include or exclude from PHE	



Recommendations for people at above-average risk

The Canadian Task Force on Preventive Health Care found insufficient information to recommend more intense screening for people with a family history of polyps or colorectal cancer in only one or two first-degree relatives (parent, sibling or child). Despite evidence that such individuals have an increased prevalence of neoplasms, the Task Force recommends that such people be screened in the same way as those at average risk unless their families meet the criteria for Hereditary Non-Polyposis Colon Cancer (HNPCC) families.¹⁵ HNPCC accounts for only 1%–2% of all colorectal cancer.

The Canadian Cancer Society is publishing recommendations for using medical and family history to triage individuals as being at high, moderate, or low risk of hereditary/familial colorectal cancer and for management at various levels of risk. Management may include colonoscopy, FOBT, referral to a colorectal specialist and/or offering referral to a hereditary colorectal cancer clinic or genetics centre.¹⁷

Implementation in Ontario

An estimated 6,000 deaths could be prevented by 2030 if Ontario successfully implemented a fecal occult blood test (FOBT) screening program.¹⁸

Colorectal screening rates in Ontario are low. Only about 20% of Ontarians aged 50–65 appear to have had any bowel investigations, most of which would not be for screening.⁷ In a 1999 pilot health survey in Durham Region, only about 20% of respondents aged 50–69 said they had ever had FOBT as part of a checkup or for routine screening. Just 15% of those aged 50–69 reported having the test in the previous two years.¹⁹

Cancer Care Ontario and its partners are evaluating approaches to recruitment for colorectal screening with FOBT, aimed at Ontarians aged 50–75 who are at average risk of colorectal cancer.²⁰

PRESENTATION AND TREATMENT

Presentation and diagnosis

Common symptoms of colorectal cancer include a change in bowel habits, diarrhea or constipation, blood in the stool, narrower stools than usual, general abdominal discomfort, unexplained weight loss and constant tiredness. Often there are no symptoms until disease is advanced. Signs of bowel obstruction include acute crampy abdominal pain, abdominal distension, nausea and vomiting.

If colorectal cancer is suspected, complete visualization of the total colon is indicated, with either colonoscopy, or barium enema plus flexible sigmoidoscopy.

Treatment strategies

Treatment depends primarily on the extent of spread, or stage, of the cancer. An individual's general health influences whether optimal therapy can be administered.

- **Surgery** to remove the tumour and part of the colon is the most common initial treatment. A colostomy may be necessary to allow fecal waste to leave the body through an opening in the abdominal wall. This opening may be temporary to allow healing of the bowel after surgery, but in 15% of cases it is permanent. Less invasive surgery has become more common for rectal cancer in order to maintain fecal continence.
- **Radiotherapy** may be used with or without chemotherapy to shrink rectal tumours pre-operatively, or, combined with chemotherapy post-operatively, to destroy microscopic residual cancer cells. It can also be used to relieve symptoms from an inoperable or recurrent rectal cancer. Radiotherapy may be administered by external beam (a high-energy X-ray beam) or by the implantation of a radioactive source directly into the tumour.

- **Chemotherapy** is used to destroy subclinical tumour deposits after colon surgery for patients with Stage III disease and selected Stage II disease. It is also used in metastatic (Stage IV) cancer to palliate symptoms and to increase survival. New chemotherapy regimens are constantly being developed and tested in clinical trials.
- **Other systemic therapies** that modulate the immune system, affect tumour blood vessels and attack specific tumour-associated antigens are in development and show promise. None has yet achieved the status of a standard therapy.

Treatment in Ontario

A recent evaluation of practice within regional cancer centres affiliated with Cancer Care Ontario found that patients with Stage III colon cancer routinely receive treatment with adjuvant chemotherapy in a fashion consistent with practice guidelines developed by Cancer Care Ontario's Program in Evidence-Based Care. Few patients with Stage II disease receive adjuvant systemic chemotherapy, which is also consistent with guidelines. Because of lack of access to data on systemic therapy treatment in Ontario, it is not currently possible to assess whether all those who might benefit from such therapy receive appropriate treatment.

From the available data, it appears that only a small percentage of patients with metastatic colon cancer are seen in Ontario's regional cancer centres for palliative chemotherapy. Although it is possible that these patients are being seen by community-based oncologists, it is also possible that referring physicians are unaware of the potential survival and symptom control benefits of palliative chemotherapy, and/or that patients decline referral because of concerns about the toxicity of treatment.



Clinical practice guideline (CPG) summary

Stage	Recommendation	Guideline number
Colon cancer		
I	Standard treatment is surgical resection alone	No guideline
II	Adjuvant chemotherapy not routinely recommended Patients at high risk of recurrence (presentation associated with bowel obstruction, tumour abscess or perforation, or if tumour demonstrates aneuploidy on histology) may be considered for adjuvant chemotherapy similar to Stage III	CPG #2-1
III	Adjuvant therapy is recommended within five weeks of surgery; 5-fluorouracil-based regimens are administered over 6–12 months	CPG #2-2
IV	Systemic therapy with oral capecitabine or 5-fluorouracil and leucovorin alone when monotherapy is selected, or 5-fluorouracil and leucovorin in combination with irinotecan when combination therapy is preferred	CPG #2-15, 2-16, 2-16b
Rectal cancer		
II, III	Both chemotherapy and radiotherapy reduce local recurrence in resectable rectal cancer; post-operative radiotherapy combined with chemotherapy appears to provide the greatest benefit. Pre-operative radiotherapy (with post-operative chemotherapy, at least for patients with Stage III disease) is an acceptable alternative	CPG #2-3, 2-13
IV	Systemic therapy as for colon cancer	CPG #2-15, 2-16, 2-16b
Colorectal cancer follow-up		
I, IIa	Visits yearly or when symptoms occur; follow-up colonoscopy within six months of surgery; repeat yearly if villous/tubular adenomas >1 cm found, otherwise every 3–5 years	CPG #2-9
IIb, III	Assess when symptoms occur or every six months in first three years, then yearly for at least five years	

Source: Cancer Care Ontario (Program in Evidence-Based Care)²¹

Despite evidence that radiation therapy benefits patients with Stage II and III rectal cancer, a retrospective review demonstrated that 32% of Stage II and III patients were not referred and 29% of those referred refused radiotherapy treatment.²²

Complications & quality of life

Surgery may cause temporary constipation or diarrhea. With a colostomy there may be irritation of the skin around the opening in the abdominal wall. Common side effects of radiotherapy are fatigue, skin changes at the site where treatment is given, loss of appetite, nausea and diarrhea. Radiotherapy may also cause bleeding from the lining of the rectum and/or the bladder. Chemotherapy side effects depend on the

specific drugs and dose, but often include nausea and vomiting, hair loss, mouth sores, diarrhea and fatigue. Infection or bleeding are more serious, but less common.

Long-term complications include erectile dysfunction after rectal surgery, and the difficulties of living with a colostomy. Supports exist for people with colorectal cancer and their families, including members of the health care team, local support groups and counseling.

Social scientists are studying different coping skills, and whether relaxation techniques, behavioural therapy and acupuncture can lessen the impact of colorectal cancer.

RISK MODIFIERS AND PREVENTION

Factors modifying the risk of colorectal cancer

Evidence	Decreases risk	Increases risk
Convincing	Physical activity*	Obesity** Central adiposity* Smoking Family history*** Crohn's disease or ulcerative colitis
Probable	Vegetables Folate Vitamin D Hormone replacement therapy	Red meat Alcohol
Possible	Fibre Starch Vitamin A, carotenoids Vitamin E Calcium Selenium	Total fat Saturated/animal fat Sugar

Sources: Institute of Medicine, 2003²⁴
U.S. Preventive Services Task Force, 2002²⁷

* Colon; weaker, less consistent or less studied for rectum²³

** Colon only²³

*** Family history of colorectal cancer in a first-degree relative (parent, sibling or child)

Recommendations to reduce cancer risk

Physical activity ²⁸	At least 30–45 minutes of moderate to vigorous activity on most days of the week
Body weight ²⁹	Body mass index (BMI) <25 kg/m ² *
Tobacco ³⁰	Be a non-smoker and avoid second-hand smoke
Alcohol ³⁰	No more than 1–2 drinks per day
Vegetable and fruit consumption ³¹	5–10 servings daily**

* See Glossary for *Body mass index*

** *Canada's Food Guide to Healthy Eating* describes a serving as 1 medium size vegetable or fruit, 1/2 cup of fresh, frozen or canned vegetables or fruit, 1 cup of salad or 1/2 cup of 100% fruit or vegetable juice.³¹

Factors modifying colorectal cancer risk

Physical activity decreases the risk of colon cancer (the evidence is weaker for rectal cancer).²³ **Obesity** (usually measured by body mass index) and **central adiposity** (usually measured as a high waist:hip ratio) increase the risk of colon cancer. There is now convincing evidence for a causal association between **smoking** and an increased risk of colorectal cancer.²⁴ Risks are elevated for both colon and rectal cancer, especially for long-term heavy smoking.²⁵

Increased risk associated with colorectal cancer in close relatives may be the result of heredity, or a similar lifestyle, or a combination of these. **The Ontario Familial Colorectal Cancer Registry** is part of an international project to study genetic and other causes of colorectal cancer in people with and without relatives with the disease.³²

Although numerous studies and one randomized trial have found that hormone replacement therapy (HRT) reduces the risk of colorectal cancer, the risks of HRT may outweigh any benefit.²⁶

Many dietary components are still being assessed as to their potential for raising or lowering the risk of colorectal cancer. Research also continues on the protective potential of **nonsteroidal anti-inflammatory drugs** (NSAIDs).

General recommendations for reducing cancer risk are applicable to colorectal cancer.



GLOSSARY OF TERMS, DATA SOURCES AND METHODS

Adenocarcinoma

Cancer in cells that have glandular (secretory) properties.

Adjuvant chemotherapy

Chemotherapy given after primary treatment with surgical resection, directed at any cancer cells remaining in the body.

Age-standardized rate

The number of new cases of cancer or cancer deaths per 100,000 person-years that would have occurred in the standard population (1991 Canadian population) if the actual age-specific rates observed in a given population had prevailed in the standard population.

Age-specific rate

The number of new cases of cancer or cancer deaths, expressed as a rate per 100,000 person-years, in a given age group.

Aneuploidy

Fewer or more than the normal human set of 46 chromosomes.

Average annual percent change in rate

A measure to assess the rate of change over time of an incidence or mortality rate, calculated by fitting a linear model to the annual rates after applying a logarithmic transformation. The estimated slope is then transformed back to represent a percentage increase or decrease per year. The method used allows for a series of straight line segments with different slopes to be fit to long-term trend data. It estimates both the specific years at which the slope (rate of change) changes significantly and the slope of each line segment.

Barium enema

A series of X-rays of the colon and rectum; the patient is given an enema along with a solution that contains barium, which outlines the colon and rectum on the X-rays.

Body mass index (BMI)

A measure of body weight adjusted for height, calculated as weight in kilograms/(height in metres)².

Clinical practice guideline (CPG)

An evidence-based statement that assists patients and health care providers in making appropriate decisions about cancer care. Within Cancer Care Ontario's Program in Evidence-Based Care, the Disease Site and Guideline Development Groups develop clinical practice guidelines and evidence summaries.

Colonoscopy

Examination of the walls of the entire rectum and colon (or as far up as possible) through a tube with a light on the end, after a day of clear liquids and laxatives. Biopsies may be taken, and polyps or other lesions removed, through the colonoscope.

Colostomy

An opening into the colon from the outside of the body. The opening provides a new path for waste material to leave the body after part of the colon has been removed.

CT colography ("virtual colonoscopy")

A spiral CT scan of the abdomen, taken after laxatives and the insertion of a probe to push air into the colon. A computer puts together an image of the colon for examination by a radiologist.

Fecal occult blood test (FOBT)

A test for invisible (occult) bleeding, which may be caused by colon cancer or other conditions. A small sample of feces is placed on a card and a chemical solution added. If occult blood is present, further testing is required to determine the source of bleeding.

Median age at diagnosis/death

The age for which 50% of the diagnoses or deaths occur in younger individuals and 50% occur in older individuals.

Moving average rate

Rate calculated using the sum of the new cases of cancer or cancer deaths for a three-year period and the population estimates for those same years. Three-year moving average rates are shown on all graphs describing trends in order to smooth out annual fluctuations.

Ontario Cancer Registry (OCR)

The population-based database that includes information on all diagnoses of cancer reported in residents of Ontario since 1964. The Registry includes limited data about diagnosis (date, type of cancer), death (date, cause), treatment, and the individual (date of birth, sex, census division of residence at diagnosis or death) for all cancer patients. The Registry does not include data on risk factors, stage, grade, or basal or squamous cell skin cancers.

Polyp

A growth that protrudes from a mucous membrane; a colorectal polyp is a growth on the inner wall of the colon or rectum. An adenomatous polyp has neoplastic tissue derived from glandular epithelium.

Population data

Population counts used as denominators of rates. Statistics Canada, which conducts the National Population Census every five years, provides annual population estimates by five-year age groups and census divisions.

Potential years of life lost (PYLL)

A method that helps to describe the extent to which life is cut short by cancer. It is calculated by multiplying the number of deaths from a particular cancer at each individual age by the life expectancy of survivors.

Prevalence

The number of individuals alive and diagnosed with colorectal cancer in the previous 15 years, according to the Ontario Cancer Registry. This number is probably an overestimate, because deaths that occur outside Ontario may not be reported to the Registry.

Regions

Cancer planning regions that correspond to aggregations of census divisions, and are to some extent defined by the locations of specialized cancer treatment centres.

Regional variation

Incidence and mortality rates and relative survival for each region compared to those of all Ontario. Region-specific values are considered significantly different from Ontario if the 95% confidence interval excludes the overall provincial value.

Relative survival (Brenner's period method)¹³

A measure of the reduction in life expectancy due to a diagnosis of colorectal cancer. To estimate survival for those diagnosed in the recent past, cases alive during 1996–2000 are included ("period survival"). Relative survival is estimated from life tables as the ratio of observed survival of colorectal cancer cases five years after diagnosis to the expected survival of men or women in the general population who are the same age. The ratio is expressed as a percentage.

Sigmoidoscopy

Examination of the walls of the rectum and sigmoid colon through a tube with a light on the end. Enemas are given beforehand to clean out the bowel.

Staging

A method to describe the size and extent of spread of cancer.

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CANADIAN CANCER SOCIETY INFORMATION RESOURCES

If you would like some additional information material relating to colorectal cancer, the Canadian Cancer Society offers the following, which are available in English and French.

Colorectal Cancer: Know the facts. This brochure is general in nature and focuses on information relating to colorectal cancer risk factors, screening, diagnosis and treatment.

Colorectal cancer: What you need to know. This information brochure covers a number of issues relating to colorectal cancer including risk factors, colorectal cancer testing and common treatment methods.

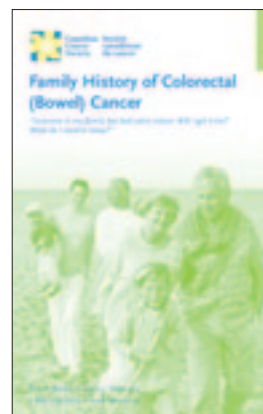
Family History of Colorectal (bowel) cancer: This booklet provides guidance for people who may have an increased risk of colorectal cancer as a result of family history. It provides general information about colorectal cancer and insight into the role heredity plays in colorectal cancer risk.

Chemotherapy and you: This booklet offers information about what to expect when undergoing chemotherapy as well as suggestions on how to deal with side effects from treatment.

Radiation therapy and you: This booklet offers information about what to expect when undergoing radiation treatment as well as suggestions on how to deal with side effects from treatment.

Studies have shown a link between diet and colorectal cancer risk. The Canadian Cancer Society's healthy eating and cancer risk reduction message follows *Canada's Food Guide* recommendations, and also encourages Canadians to eat plenty of vegetables and fruits through the 5 to 10 a day program (www.5to10aday.com).

The Canadian Cancer Society's *Cancer Information Service*, a national, bilingual, toll-free service, offers comprehensive information about cancer and community resources to cancer patients, their families, the general public and healthcare professionals. The Canadian Cancer Society also has information for people living with cancer. Call 1 888 939-3333 or visit us online at www.cancer.ca.





INSIGHT ON CANCER

news and information on *colorectal cancer*



Cancer Care Ontario is dedicated to improving the quality of care and safety for cancer patients by creating a seamless journey for them as they access the highest quality programs in cancer prevention, early detection, treatment, supportive care, palliative care and research. Working with partners, including the Cancer Quality Council of Ontario, CCO will measure, evaluate and report on quality improvement in the cancer system. Cancer Care Ontario is a policy, planning and research organization that advises government on all aspects of provincial cancer care.

To order additional copies, contact the Canadian Cancer Society's *Cancer Information Service* at 1 888 939-3333 or through the webmaster at webmaster@ccsont.org.

Insight on Cancer can be found on both the Canadian Cancer Society's and Cancer Care Ontario's websites. Please visit the "library section" of the Ontario pages of the Canadian Cancer Society's website located at www.cancer.ca, or visit www.cancercare.on.ca.



The Canadian Cancer Society is a national, community-based organization of volunteers whose mission is the eradication of cancer and the enhancement of the quality of life of people living with cancer.

The Canadian Cancer Society, in partnership with the National Cancer Institute of Canada, achieves its mission through research, education, patient services and advocacy for healthy public policy. These efforts are supported by volunteers and staff and funds raised in communities across Canada.