International Trends in Colorectal Cancer Incidence Rates

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Abstract

Background: **Previous studies have documented significant variations in colorectal cancer incidence rates and trends regionally and across countries. However, no study has examined the worldwide pattern using the most recently updated incidence data from the IARC.**
Methods: **We obtained sex-specific colorectal cancer incidence for 1953-57 through 1998-2002 by cancer registry from Cancer Incidence in Five Continents (CI5) databases. For 51 cancer registries with long-term incidence data, we assessed the change in the incidence rates over the past 20 years by calculating the ratio of the incidence rates in 1998-2002 to that in 1983-87.**
Results: **Colorectal cancer incidence rates for both males and females statistically significantly increased from 1983-87 to 1998-2002 for 27 of 51 cancer registries considered in the analysis, largely confined to economically transitioning countries including Eastern European countries, most parts of Asia, and select countries of South America. These increases were more prominent for men than for women. We also observed substantial variations in colorectal cancer incidence trends within countries such as Japan. Similarly, trends in Israel and Singapore varied significantly according to ethnicity. The United States is the only country where colorectal cancer incidence rates declined in both males and females.**
Conclusions: **Colorectal cancer incidence rates continue to increase in economically transitioning countries, with incidence rates among men in the Czech Republic and Slovakia exceeding the peak incidence observed in the United States and other long-standing developed nations. Targeted prevention and early detection programs could help reverse the trend in these countries.** (Cancer Epidemiol Biomarkers Prev 2009;18(6):1688–94)

Introduction

Colorectal cancer is the fourth most common cancer in men and the third most common cancer in women worldwide (1, 2). Previous studies have reported rapid increases in colorectal cancer incidence rates, particularly in economically transitioning countries in many parts of the world, and these increases are thought to reflect changing dietary and physical activity patterns (3-8). However, these studies were limited because they were based on old data and examined regional or country-specific trends. No study published in a peer-reviewed journal has presented colorectal cancer incidence trends across all five continents. In this article we present the contemporary variation in colorectal cancer incidence trends worldwide by examining the rates based on incidence data over a 20-year period (1983-2002) for 55 registries on 5 continents (Africa, the Americas, Asia, Europe, and Oceania) from the IARC.

Materials and Methods

Colorectal cancer incidence rates aggregated over 5 years by cancer registry were obtained from IARC's Cancer Incidence in Five Continents (CI5) databases. The CI5 series aims to provide data on cancer incidence from populations all over the world for which high-quality data are available; therefore, data sources vary and include national registries (e.g., Czech Republic, New Zealand), local registries (e.g., Murcia in Spain, Miyagi in Japan), or aggregates of local registries (e.g., nine SEER registries which we used to represent the United States; refs. 9, 10). We restricted our analysis to 51 cancer registries that have incidence data beginning at least in 1983-87; for completeness, however, we also explored four additional registries in Africa with long-term data of varying time intervals. We examined the change in the incidence rates over 20 years among men and women by calculating the ratio of the incidence rates in 1998-2002 to that in 1983-87. Statistical significance was determined by calculating 95% confidence intervals for the rate ratios (11). In describing the change, the terms "increase" or "decrease" were used when the rate ratio was statistically significant; otherwise the term "stable" was used. In addition to calculating the change in incidence between the two time intervals, we present all available incidence rates since 1953-57 for select registries in Figs. 1 through 3 and in Supplemental Figs. S1 and S2 on the web. All rates were age-standardized to the 1960 world standard population in order to compare data across countries over time with different age compositions.

Although there are differences in the etiologies and epidemiology of colon and rectal cancer (12), we chose to examine colon and rectum cancers combined in order to avoid misclassification that may occur for tumors at the rectosigmoid junction. Colorectal cancer incidence

Cancer Epidemiol Biomarkers Prev 2009;18(6):1688–94

Received 1/30/09; revised 2/25/09; accepted 3/3/09; published online 6/8/09.

Note: Supplementary data for this article are available at Cancer Epidemiology Biomakers and Prevention Online (http://cebp.aacrjournals.org/).

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doi:10.1158/1055-9965.EPI-09-0090

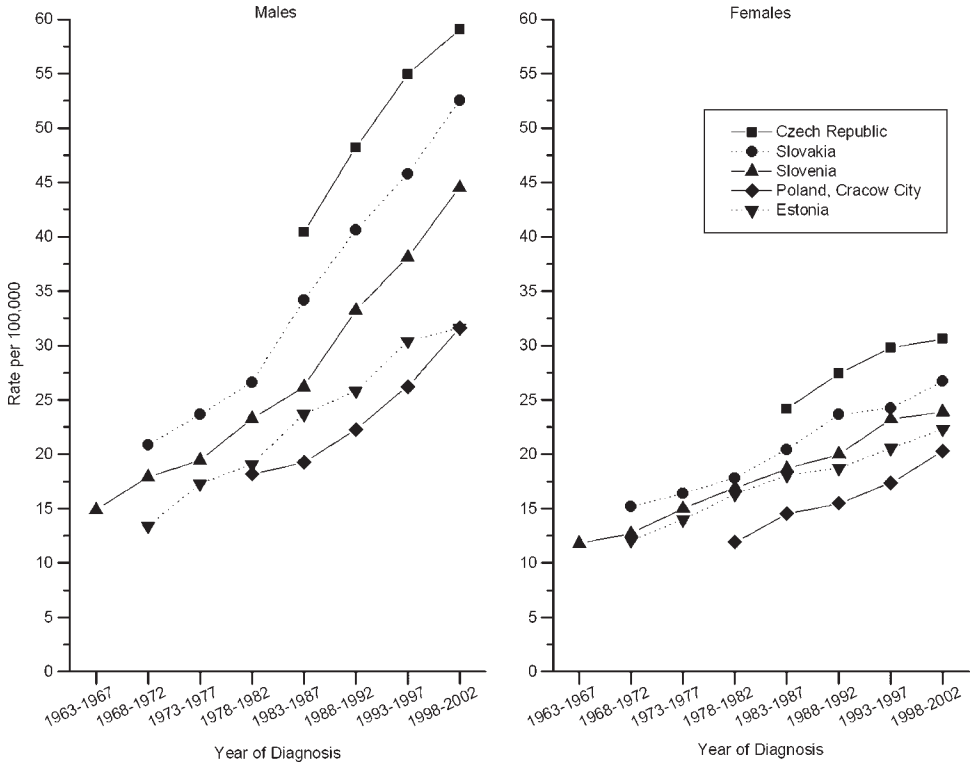

Figure 1. Trends in colorectal cancer incidence rates in select countries of Eastern Europe by sex (Cancer Incidence in Five Continents, 1963-2002).

data in the CI5 database are categorized according to ICD-10 codes (C18-C21) or ICD-7 through ICD-9 codes (153-157), which include cancers of the colon, rectum, and anus. We will refer to these cancers collectively as colorectal cancer.

Results

Colorectal cancer incidence rates for both males and females statistically significantly increased from 1983-87 to 1998-2002 for 27 of 51 cancer registries considered in the analysis. The increases occurred in registries from all parts of the world including Eastern European countries, most parts of Asia, and select countries of South America.

In the European region, the largest increase in colorectal cancer incidence rates from 1983-87 to 1998-2002 occurred in Slovakia, Slovenia, and the Czech Republic (>45% among men and 25% among women; Table 1). For those countries with more historical data, these trends are continuations of increases that began in 1963-67 (Fig. 1). The Czech Republic had the highest colorectal cancer rate for males in 1998-2002 of all the 55 registries examined and Slovakia had the 4th highest (Table 1, Supplemental Table S1). The rates for males in these two countries have exceeded the peak colorectal cancer incidence for males observed in long-standing developed nations such as the United States. Registries in Northern Europe such as Norway and Finland showed a slight increase between 11% and 16% among men and women from 1983-87 to 1998-2002, whereas rates in Sweden and Denmark have leveled off (Table 1, Supplemental Fig. S1). Northern European countries were intermediate in their rates of colorectal cancer in 1998-2002 compared with other registries with the exception of Norway and Denmark which had the 8th and 15th highest colorectal cancer rates, respectively, among females (Table 1, Supplemental Table S1).

In general, colorectal cancer incidence rates from registries in Western Europe such as those in France, Italy, England, Germany, and Switzerland remained stable or only slightly increased from 1983-87 to 1998-2002. Spain was the exception in Western Europe as large increases in colorectal cancer incidence occurred in all registries among both men and women (Supplemental Fig. S2). In Spain, from 1983-87 to 1997-2001, rates increased as much as 87% among men and 35% among women in the Murcia registry (Table 1).

In Asia, colorectal cancer incidence increased from 1983-87 to 1998-2002 for both males and females in every registry we examined, except in Mumbai, with the largest increases occurring in Japan, Kuwait, and Israel (Table 2). However, some areas with large rate increases such as India, Thailand, and Kuwait still maintained relatively low colorectal cancer incidence rates in the most recent time period (Table 2, Supplemental Table S1).

In addition to variation across countries, striking variation in colorectal cancer incidence trends are found in some Asian countries by region or ethnicity. For example in Japan, colorectal cancer incidence rates from 1983-87 to 1998-2002 among males increased by >90% in the Yamagata and Miyagi registries, compared with 35% in Osaka (Table 2). Notably, the rates for 1998-2002 in Yamagata and Miyagi were nearly twice as high as those in Osaka (Fig. 2) and, as seen in the Czech Republic and Slovakia, rates for males in these two registries exceeded the peak colorectal cancer incidence rates for males in the United States, New Zealand, and Canada (Fig. 3). In China, colorectal cancer incidence rates in both males and females increased by 50% in Shanghai compared

with 10% in Hong Kong over the same time period (Table 2).

In Singapore, colorectal cancer incidence rates from 1983-87 to 1998-2002 increased by more than 55% among the Malay population and by 10% to 30% among the Chinese population (Table 2). Similar incidence patterns by ethnicity are observed in Israel where colorectal cancer incidence rates during the same time period more than doubled in non-Jewish men and women, but increased by <20% in Jewish men and women (Table 2). Despite these dramatic increases in colorectal cancer incidence rates in the Malay population in Singapore and the non-Jewish population in Israel, rates during 1998-2002 remain only one half of the corresponding rates in the Chinese and Jewish populations, respectively (Table 2).

Table 3 shows colorectal cancer incidence trends for select countries in North America, South America, and Oceania. Similar to cancer registries in Asia and Eastern Europe, colorectal cancer incidence rates from 1983-87 to 1998-2002 increased substantially in Colombia (Cali) and Costa Rica, but current rates in these registries were among the nine lowest of all registries considered in this analysis (Supplemental Table S1). In Australia, rates increased slightly for all five registries in men and for two registries in women. These registries continue to report some of the highest colorectal cancer incidence rates worldwide (Supplemental Table S1). It is interesting to note that in all registries with increasing trends, the increase was larger in men than in women.

In contrast to most registries considered in this analysis, colorectal cancer incidence rates from 1983-87 to 1998-2002 decreased statistically significantly for US men and women, based on nine SEER registries, and for Canadian and New Zealand women. Rates were stable for Canadian and New Zealand men (Table 3, Fig. 3). Based on recent incidence data from the United States, colorectal cancer incidence rates continued to decrease through 2005 in both males and females (13, 14).

Table 1. Age-standardized colorectal cancer incidence rates by sex for select regions of Europe (Cancer Incidence in Five Continents)

	Males			Females		
	1983-87	1998-2002	Rate ratio* (95% CI)	1983-87	1998-2002	Rate ratio* (95% CI)
Eastern Europe						
Czech Republic	40.4	59.1	**1.46** (1.43-1.50)	24.2	30.6	**1.27** (1.23-1.30)
Estonia	23.7	31.6	**1.33** (1.23-1.45)	18.1	22.3	**1.23** (1.14-1.33)
Poland						
Cracow City	19.2	31.6	**1.64** (1.44-1.87)	14.5	20.3	**1.40** (1.24-1.58)
Slovakia	34.2	52.5	**1.54** (1.48-1.59)	20.4	26.7	**1.31** (1.25-1.36)
Slovenia	26.2	44.5	**1.70** (1.59-1.81)	18.7	23.9	**1.28** (1.20-1.37)
Northern Europe						
Denmark	37.6	39.3	**1.05** (1.01-1.08)	30.1	29.8	0.99 (0.96-1.03)
Finland	22.4	25.6	**1.14** (1.10-1.20)	17.6	19.5	**1.11** (1.06-1.16)
Iceland	27.6	31.2	1.13 (0.94-1.36)	20.3	23.8	1.17 (0.95-1.44)
Norway	35.5	40.7	**1.15** (1.11-1.19)	28.2	32.7	**1.16** (1.12-1.21)
Sweden	28.9	30.0	**1.04** (1.01-10.7)	23.4	23.4	1.00 (0.97-1.03)
Western Europe						
France						
Bas-Rhin	47.8	48.7	1.02 (0.95-1.10)	27.7	26.1	0.94 (0.86-1.03)
Calvados	34.6	33.6	0.97 (0.87-1.08)	22.3	20.2	0.91 (0.80-1.03)
Doubs	39.7	38.6	0.97 (0.87-1.09)	25.4	21.9	**0.86** (0.75-0.99)
Isere	39.2	40.3	1.03 (0.95-1.11)	22.2	24.6	**1.11** (1.01-1.22)
Somme	35.2	37.5	1.07 (0.95-1.19)	23.2	22.8	0.98 (0.87-1.12)
Tarn	42.4	37.2	**0.88** (0.78-0.99)	24.5	22.9	0.94 (0.81-1.08)
Italy						
Parma Province	37.2	42.6	**1.14** (1.03-1.27)	25.5	27.1	1.06 (0.94-1.20)
Ragusa Province	19.9	30.9	**1.56** (1.31-1.85)	16.8	22.8	**1.36** (1.13-1.63)
Lombardy, Varese Province†	38.5	43.4	**1.13** (1.03-1.23)	25.6	27.5	1.07 (0.97-1.19)
Germany						
Saarland	43.3	51.1	1.18 (1.11-1.26)	30.9	32.8	1.06 (0.99-1.14)
Spain						
Murcia†	20.6	38.5	**1.87** (1.70-2.06)	18.1	24.3	**1.35** (1.22-1.49)
Navarra	25.6	39.4	**1.54** (1.37-1.72)	18.5	22.1	**1.20** (1.05-1.37)
Tarragona†	24.4	41.3	**1.69** (1.51-1.90)	19.7	25.8	**1.31** (1.17-1.46)
Switzerland						
Geneva	36.6	32.8	0.90 (0.79-1.02)	25.6	24.9	0.97 (0.85-1.11)
St Gall-Appenzell	27.4	32.2	**1.17** (1.04-1.33)	18.9	20.9	1.11 (0.96-1.27)
The Netherlands						
Eindhoven	39.0	43.9	**1.12** (1.04-1.22)	28.2	32.3	**1.14** (1.05-1.25)
UK, England						
Birmingham and West Midlands Region	37.4	38.3	1.02 (0.99-1.06)	24.4	23.9	0.98 (0.94-1.02)
Merseyside and Cheshire	35.9	40.9	**1.14** (1.09-1.20)	24.7	23.0	**0.93** (0.88-0.98)
North Western Region	33.7	38.6	**1.15** (1.10-1.19)	24.6	24.5	1.00 (0.96-1.04)

NOTE: Colorectal cancer includes cancer of the colon, rectum, and anus.
Incidence rates are per 100,000 persons and were age-adjusted to the 1960 world standard population.
Abbreviation: 95% CI, 95% confidence interval.
*For ease of interpretation significant rate ratios are presented in bold.
†Rates for the second time interval for Varese Province, Murcia, and Tarragona were based on incidence data for the years 1998-2000, 1997-2001, and 1998-2001, respectively.

Table 2. Age-standardized colorectal cancer incidence rates by sex for select regions of Asia (Cancer Incidence in Five Continents)

	Males			Females		
	1983-87	1998-2002	Rate ratio* (95% CI)	1983-87	1998-2002	Rate ratio* (95% CI)
China						
Hong Kong	35.6	39.2	**1.10** (1.06-1.14)	26.1	28.4	**1.09** (1.05-1.13)
Shanghai	17.8	27.2	**1.53** (1.47-1.59)	15.6	23.2	**1.49** (1.42-1.56)
Japan						
Miyagi Prefecture	30.6	58.7	**1.92** (1.82-2.02)	22.2	32.6	**1.47** (1.39-1.56)
Osaka Prefecture	27.7	37.4	**1.35** (1.31-1.39)	17.0	21.7	**1.27** (1.23-1.32)
Yamagata Prefecture	26.2	55.8	**2.13** (1.99-2.28)	19.7	31.4	**1.59** (1.48-1.71)
Philippines						
Manila	19.1	24.3	**1.27** (1.16-1.39)	15.4	18.5	**1.20** (1.10-1.32)
Singapore						
Chinese	35.4	46.0	**1.30** (1.22-1.39)	28.7	31.7	**1.10** (1.03-1.18)
Malay	14.4	22.5	**1.57** (1.19-2.06)	11.7	18.2	**1.56** (1.16-2.11)
Thailand						
Chiang Mai	7.1	9.9	**1.39** (1.16-1.65)	6.4	9.2	**1.44** (1.20-1.73)
India						
Chennai (Madras)	3.7	5.7	**1.56** (1.33-1.83)	3.3	4.3	**1.32** (1.11-1.58)
Mumbai (Bombay)	6.4	5.9	0.93 (0.84-1.02)	5.3	4.4	**0.83** (0.74-0.92)
Kuwait						
Kuwaitis	6.2	13.7	**2.21** (1.50-3.26)	7.0	12.5	**1.80** (1.19-2.70)
Israel						
Jews	36.4	43.0	**1.18** (1.13-1.23)	30.4	34.7	**1.14** (1.09-1.19)
Non-Jews†	8.2	19.2	**2.34** (2.07-2.65)	7.5	15.8	**2.11** (1.58-2.81)

NOTE: Colorectal cancer includes cancer of the colon, rectum, and anus.
Incidence rates are per 100,000 persons and were age-adjusted to the 1960 world standard population.
*For ease of interpretation significant rate ratios are presented in bold.
†The rate for the first time interval was based on incidence data for the years 1982-1986.

Incidence data for corresponding time intervals (1983-87 to 1998-2002) are not available from any cancer registries in Africa. However, for completeness we examined data from four African registries, namely, Algeria (Setif), Mali (Bamako), Uganda (Kyadondo County), and Zimbabwe (Harare), with varying time intervals. From 1986-89 to 1998-2002, colorectal cancer incidence rates (per 100,000) tripled in Algeria (Setif), from 2.0 to 6.6 in males and from 2.3 to 6.8 in females. In contrast, rates remained stable for Mali, Uganda, and Zimbabwe (data not shown).

Discussion

Colorectal cancer incidence rates from 1982-87 through 1998-2002 increased for both males and females in 27 of the 51 cancer registries included in this analysis. The increase was largely confined to economically transitioning countries with rates for males in the Czech Republic, Slovakia, and Japan in 1998-2002 exceeding those in long-standing economically developed countries such as the United States, Canada, and Australia. In contrast, incidence rates stabilized in the majority of developed countries and only decreased in the United States.

Factors that may have contributed to the worldwide variation in colorectal cancer incidence patterns include differences in the prevalence of risk factors and screening practices. Established and suspected modifiable risk factors for colorectal cancer, including obesity, physical inactivity, smoking, heavy alcohol consumption, a diet high in red or processed meats, and inadequate consumption of fruits and vegetables (12, 15, 16), are also factors associated with economic development or westernization (17). This partially explains the historically high albeit decreasing colorectal cancer incidence rates observed in long-standing developed countries such as the United States, Canada, and New Zealand over the past several years. Colorectal cancer screening can also influence colorectal cancer incidence rates. All screening tests including stool blood tests (e.g. fecal occult blood test) and structural screening tests (e.g. sigmoidoscopy and colonoscopy) may increase colorectal cancer incidence rates initially as they detect previously undiagnosed cases. Colonoscopy is also able to reduce the incidence of colorectal cancer through the removal of precancerous polyps. In the United States, joint colorectal cancer screening recommendations were first released in 1997 (18) although guidelines for opportunistic screening have been utilized since the early 1980s (19); between 1987 and 2003, screening rates increased from approximately 27% to approximately 45% (20). In recent years colonoscopy has been the most prevalent of all colorectal cancer screening tests used in the United States (20), and this has contributed to the decrease in colorectal cancer incidence rates among US males and females (21, 22). In Canada, national guidelines recommending colorectal cancer screening were only released in 2001, and screening rates are much lower than those in the United States (23). Similarly, screening activities have only just begun to be organized in New Zealand (24, 25). Therefore, it is unlikely that screening practices impacted any decreases in colorectal cancer incidence among women observed through 2002 in these two countries.

Colorectal cancer incidence rates in other developed regions of the world such as Australia and Western Europe have generally stabilized in recent years with the exception of Spain where rates have continued to rise since the mid-1970s. Spain remained in economic isolation after World War II and maintained a depressed economy that only revitalized after the end of Francisco Franco's regime in 1975. Therefore, westernization was delayed in Spain and this may partly explain the increasing incidence of

colorectal cancer along with the increasing prevalence of obesity in recent years (26, 27).

In contrast to the situation in long-standing economically developed countries, colorectal cancer incidence rates increased in economically transitioning countries, especially those that were once part of the Soviet Union and the Eastern European Communist Bloc such as the Czech Republic, Slovakia, Poland, and Estonia. In fact, male colorectal cancer incidence rates in the Czech Republic and Slovakia exceeded the peak incidence rates observed among males in high-income countries such as the United States. Changes in risk factors in these countries during the transition from planned market economies to open market economies could partly explain this observation. For example, a high prevalence of obesity has been reported in the Czech Republic and Slovakia (28), which could have resulted from the increased availability and consumption of food products (28-30). Data on historical patterns of smoking are not available for most Eastern European countries, including the Czech Republic and Slovakia. However, lung cancer mortality data from the WHO databases (31), which can be used as a proxy for a population's tobacco exposure (32), indicate that the tobacco epidemic peaked later and at a higher rate in the Czech Republic and Slovakia compared with the United States. The joint effect of elevated smoking prevalence and obesity may have contributed in part to the high colorectal cancer rates among males in the Czech Republic and Slovakia, surpassing the peak rate of US males. Colorectal cancer screening programs in these regions with transitioning economies are either limited or only recently implemented (33) and therefore had little influence on the increase in incidence rates observed in this study.

Japan, a developed nation with one of the strongest economies worldwide, has recorded dramatic increases in the incidence of colorectal cancer over the past several decades (34, 35), with rates for Japanese males increasing >90% in two of the three registries (Miyagi and Yamagata) considered in this study (Fig. 2). This is most likely due to the modification in dietary intake among the Japanese, including the increased intake of western-type food such as milk, meat, eggs, and fat/oil over the past several decades which has contributed to the increase in obesity in Japan (4, 36). The increase in colorectal cancer incidence in Japan as the result of westernization is further supported by studies involving Japanese migrants to the United States that document large increases in colorectal cancer rates among first-generation Japanese (37). In addition, colorectal cancer screening using fecal occult blood test, which was incorporated into public health policy in Japan in the early 1990s, may have also contributed to the increase in colorectal cancer incidence rates in Japanese registries in recent years (34, 38). Regional variations are also observed with respect to colorectal cancer incidence trends in Japan with steeper rate increases in Miyagi and Yamagata than in Osaka, the state (prefecture) with the second largest economy in Japan. Further, during the most recent time period colorectal cancer incidence rates decreased in the Osaka Prefecture consistent with the downward trend in other high-income areas of the world such as the United States.

Singapore and Israel are two countries where variations in colorectal cancer incidence rates are the direct result of the distinct ethnic/cultural differences in their populations. Colorectal cancer incidence rates have been increasing in all ethnic groups in Singapore; however, the

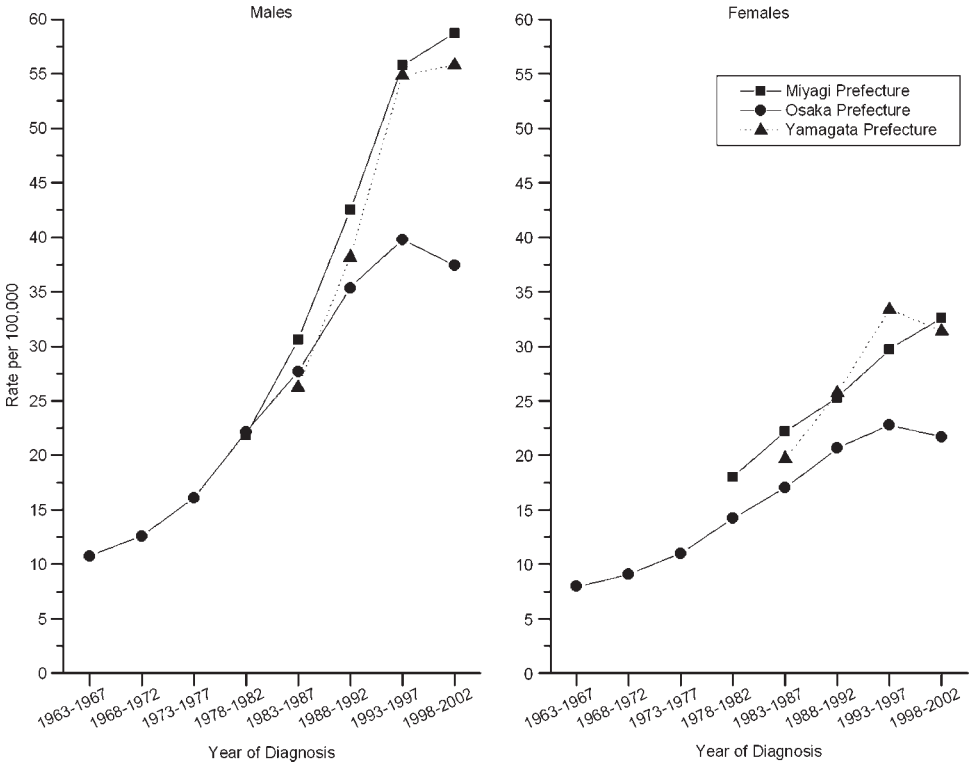

Figure 2. Trends in colorectal cancer incidence rates in select regions of Japan by sex (Cancer Incidence in Five Continents, 1963-2002).

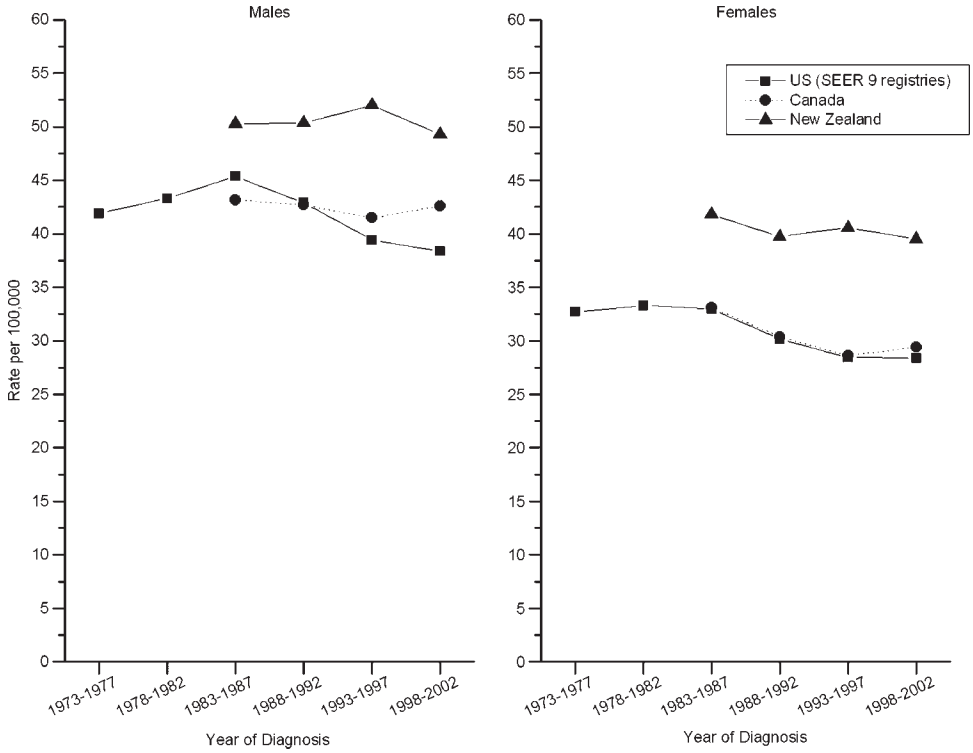

Figure 3. Trends in colorectal cancer incidence rates in Canada, New Zealand, and the United States by sex (Cancer Incidence in Five Continents, 1973-2002).

Chinese population exhibits much greater rates compared with the Malay population. Similar variations are observed between the Chinese and the Malays in Malaysia (39). The difference in incidence between these populations points to the possible role that genetic factors play in the etiology of colorectal cancer because both ethnic groups migrated to Singapore more than three generations ago (40, 41). A combination of both environmental and genetic influences is thought to be responsible for the varying colorectal cancer incidence rates in Israel where, although increasing among both populations, Jews have much higher rates compared with non-Jews, the majority of whom are Arabs (42). Jews in Israel are at higher risk of colorectal cancer in part due to their more westernized lifestyle and their higher prevalence of genetic mutations (HNPCC or Lynch syndrome) known to be associated with a small percentage (1-5%) of colorectal cancers (43). In contrast, non-Jews in Israel may be at lower risk due to the maintenance of a traditional Arab diet rich in fruits, vegetables, and olive oil, as well as engaging in occupations requiring greater physical activity (44).

The smaller increase in colorectal cancer incidence rates in women compared with men worldwide may reflect the slower adoption of certain risk behaviors associated with colorectal cancer. For example, regular uptake of smoking worldwide traditionally lags several decades in women compared with men, with peak prevalence occurring at a much lower rate (45). Additionally, the obesity-related metabolic pathways that are implicated in colorectal cancer are thought to be more heavily influenced by visceral

Table 3. Age-standardized colorectal cancer incidence rates by sex for select regions of North America, South America, and Oceania (Cancer Incidence in Five Continents)

	Males			Females		
	1983-87	1998-2002	Rate ratio* (95% CI)	1983-87	1998-2002	Rate ratio* (95% CI)
Canada	43.2	42.6	0.99 (0.97-1.00)	33.1	29.4	**0.89** (0.87-0.90)
United States, SEER 9 Areas	45.4	38.4	**0.85** (0.83-0.86)	33.0	28.4	**0.86** (0.85-0.88)
Colombia						
Cali	9.0	13.6	**1.51** (1.26-1.81)	8.3	14.3	**1.73** (1.46-2.04)
Costa Rica	7.6	13.0	**1.72** (1.51-1.95)	9.0	12.1	**1.34** (1.19-1.51)
Australia						
New South Wales	43.4	47.2	**1.09** (1.06-1.12)	31.7	33.2	**1.05** (1.01-1.09)
South	41.8	48.5	**1.16** (1.09-1.23)	31.0	34.1	**1.10** (1.03-1.18)
Tasmania	41.2	48.4	**1.18** (1.05-1.31)	33.8	36.3	1.07 (0.96-1.21)
Victoria	45.8	48.3	**1.06** (1.02-1.09)	34.2	33.1	0.97 (0.93-1.01)
Western	42.3	46.3	**1.10** (1.03-1.17)	33.0	30.7	0.93 (0.87-1.00)
New Zealand	50.3	49.3	0.98 (0.94-1.02)	41.8	39.5	**0.94** (0.91-0.98)

NOTE: Colorectal cancer includes cancer of the colon, rectum, and anus.
Incidence rates are per 100,000 persons and were age-adjusted to the 1960 world standard population.
*For ease of interpretation significant rate ratios are presented in bold.

abdominal fat that men tend to accumulate more of compared with women in whom subcutaneous fat is more common (46, 47).

The strength of our study is the use of the high-quality cancer registry data of the IARC. However, IARC incidence data are limited by their geographic coverage. Further, registry-specific trends may not be generalized to countries as a whole because trends can vary significantly across registries within countries (e.g., Japan).

In general, colorectal cancer incidence rates continued to increase in economically transitioning countries, whereas rates stabilized or decreased in long-standing economically developed countries. The increase in economically transitioning countries may reflect the adoption of western lifestyles and behaviors such as the consumption of high-fat diets, physical inactivity, and smoking. Notably, male colorectal cancer incidence rates in the Czech Republic, Slovakia, and Japan have not only exceeded the peak incidence observed in the United States and other long-standing developed nations, but continue to increase. Targeted prevention and early detection programs could help reverse the trend in these countries.

Disclosure of Potential Conflicts of Interest

No potential conflicts of interest were disclosed.

Acknowledgments

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