

Inflammatory bowel disease—hospitalization

Alice Nabalamba, Charles N. Bernstein and Craig Seko

Abstract

Objectives

This analysis examines trends in hospitalization for Crohn's disease and ulcerative colitis, the two main forms of inflammatory bowel disease (IBD).

Data sources

Data are from the Hospital Morbidity Database for 1983/84 to 2000/01, and from the Health Person-Oriented Information Database for 1994/95 to 2000/01.

Analytical techniques

Sex- and age-specific rates were calculated for separations attributed to Crohn's disease and ulcerative colitis. Rates and hospital days were also calculated for hospitalizations in which IBD was among the first five diagnostic codes on a patient's discharge abstract. The frequency of rehospitalization was examined.

Main results

From the early 1980s to the mid-1990s, annual rates of hospitalization for Crohn's disease and ulcerative colitis rose slightly, but have since levelled off. Hospitalization rates for both conditions are highest among people in their twenties. The average length of stay for patients with either disease fell from about 2 weeks in 1983/84 to 9 or 10 days in 2000/01. More than a quarter of patients hospitalized for Crohn's disease and over 20% of those with ulcerative colitis were readmitted within the same year.

Key words

Crohn's disease, ulcerative colitis, patient admission, length of stay, patient readmission

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Inflammatory bowel disease (IBD) is a debilitating chronic condition that affects the gastrointestinal tract. It refers to two distinct disorders: Crohn's disease and ulcerative colitis (see *Inflammatory bowel disease*). These disorders frequently develop in young adulthood—an important time for family formation and laying the foundations of a career. Quality of life is often adversely affected, as IBD may result in lost productivity at school or work,¹ or in problems socializing. Patients usually need continuous medication and long-term follow-up.

While a recent estimate placed the number of Canadians with IBD between 150,000 and 160,000,² relatively few people are hospitalized for either Crohn's disease or ulcerative colitis. Together, these diagnoses account for less than half of one percent of hospital stays annually. However, during the past two decades, the yearly number of IBD hospitalizations and the rate per 100,000 population have remained stable. This stability persisted in the context of an overall decline in hospital use, as governments attempted to reduce costs and treat a growing number of conditions on an ambulatory basis.

Hospital data cannot, of course, be used to estimate the prevalence of IBD. Nonetheless, hospital discharge data are a means of identifying and quantifying those patients who require substantial health care resources. With information from Statistics Canada's Hospital Morbidity Database, this article tracks hospitalizations for IBD at the national and provincial levels from 1983/84 through 2000/01 (see *Methods*). Annual numbers and rates of hospitalization for patients with a primary diagnosis of Crohn's disease or ulcerative colitis are presented by age, sex and province, along

with average length of stay and total hospital days. With information from the Health Person-Oriented Information Database, the proportions of patients who are rehospitalized are shown for 1994/95 through 2000/01.

Readmission common

In 2000/01, a total of 5,564 people were admitted to hospital with a primary diagnosis of Crohn's disease, and another 2,756, with ulcerative colitis. However, together, these 8,320 people accounted for 12,254 IBD admissions, indicating that many

Inflammatory bowel disease

Inflammatory bowel disease, or IBD, refers to two distinct disorders: Crohn's disease and ulcerative colitis. The severity of these diseases can range from mild to debilitating. Even with treatment, most patients continue to have symptoms—they are simply more manageable. Although severity may fluctuate over time, for many patients, it is progressive.

Crohn's disease is chronic inflammation of the intestinal wall that usually begins in young adulthood (typically between 15 and 30).³⁻⁵ The ileum (last part of the small intestine) and the colon (major part of the large intestine) are affected most frequently, although inflammation can occur in any part of the digestive tract from the mouth to the anus. Symptoms include diarrhea, abdominal pain, fever and weight loss. Periods of mild or no symptoms may alternate with severe episodes, which can last weeks or several months. Some people may have years that are symptom-free, while for others, symptoms can be chronic and unrelenting.

For mild episodes, patients may alter their diet and use medications such as analgesics and antidiarrheal preparations. For moderate symptoms, corticosteroids are usually required. And for the advanced disease, where there is corticosteroid-resistance or dependence, conventional immunosuppressive therapy may be used, and more recently, novel and costly biological therapies have been introduced.^{6,7} Despite treatment, Crohn's disease tends to recur and often requires surgery to remove the diseased part of the intestine. However, surgery is not undertaken unless it is absolutely necessary, as further areas in the remaining intestine may become affected.

Crohn's disease can involve complications. Intestinal obstruction as a result of thickening of the intestinal wall is common. Damage to the small intestine may prevent absorption of nutrients and lead

to anemia and vitamin deficiencies. Long-term inflammation of the colon increases the risk of colorectal cancer.

Ulcerative colitis is chronic inflammation of the rectum and colon that usually begins in young adulthood.³⁻⁵ Symptoms include severe diarrhea, passage of blood and mucus, abdominal pain, fever, and eventually, weight loss. The symptoms are often intermittent, and patients may have months or years that are symptom-free.

Ulcerative colitis is usually treated with medications, although surgery to remove the diseased colon and rectum may be necessary. People with ulcerative colitis are at increased risk of colon cancer.

The causes of IBD are unknown, but recent studies have shown that genetic factors are important.⁸⁻¹⁰ The environment may also play a role, although findings are inconclusive. One study has suggested that mycobacteria originating in farm animals are transferred through the food chain and increase susceptibility to Crohn's disease,¹¹ but other researchers have not found evidence of an association with mycobacteria, either serologically or in tissue studies.^{12,13} Some research suggests that improved hygiene has reduced exposure to micro-organisms and thereby weakened immune systems, and contributed to the development of diseases such as IBD.^{14,15} The higher prevalence of IBD after partners have lived together further indicates an environmental connection.¹⁶

Prenatal or childhood infections such as measles and mumps (in close succession) have also been linked to a higher likelihood of developing IBD.^{17,18} Cigarette smoking has been associated with the development and/or exacerbation of Crohn's disease, although the prevalence of ulcerative colitis tends to be low among current smokers.¹⁹⁻²² Appendectomy at an early age has been related to a decreased likelihood of developing ulcerative colitis.²³⁻²⁶

Table 1
Individual patients and total separations for Crohn's disease and ulcerative colitis, Canada excluding territories, 1994/95 to 2000/01

	Crohn's disease			Ulcerative colitis		
	Number of patients	% with at least two hospital stays during year	Number of separations	Number of patients	% with at least two hospital stays during year	Number of separations
1994/95	5,696	28.8	8,621	2,698	23.2	3,863
1995/96	5,598	29.7	8,720	2,656	23.6	3,832
1996/97	5,702	28.4	8,711	2,575	23.8	3,727
1997/98	5,727	29.5	8,838	2,554	24.7	3,712
1998/99	5,727	28.3	8,714	2,670	22.7	3,850
1999/00	5,435	28.4	8,383	2,739	23.5	3,925
2000/01	5,564	27.5	8,305	2,756	22.1	3,949

Data source: Health Person-Oriented Information Database, 1994/95 to 2000/01

IBD patients were hospitalized at least twice that year (Table 1). More than a quarter (28%) of Crohn's disease patients had at least two hospital stays for the condition in 2000/01; the percentage for ulcerative colitis patients was 22%. Both proportions were almost unchanged from 1994/95

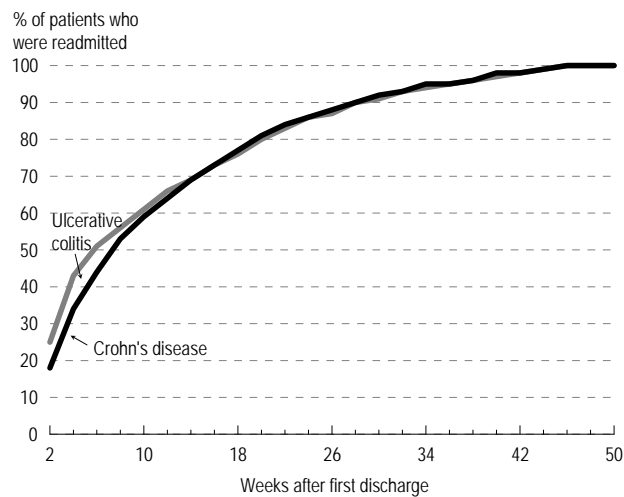
(the earliest year for which comparable data are available), when the figures were 29% and 23%, respectively.

For many of these rehospitalized IBD patients, the time between discharge and readmission was relatively short. More than a quarter of them were back in hospital within 3 weeks; half, within 7 weeks; and two-thirds within 15 weeks (Chart 1). However, from the limited information available on patients' records, it is not possible to determine if these readmissions had been planned in advance for further treatment, or if they resulted from a relapse of the disease.

Levelling off

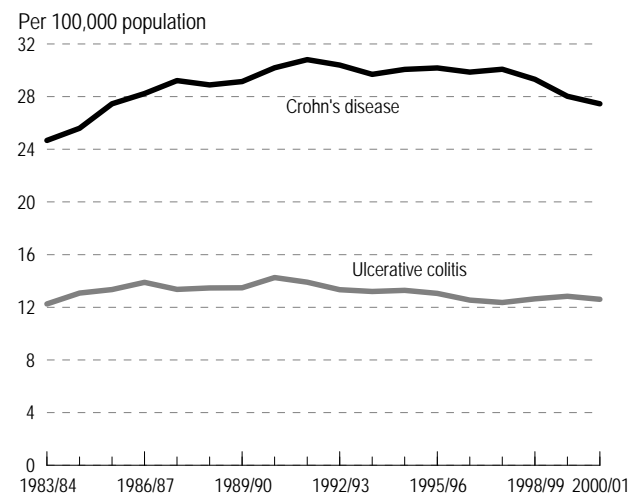
Annual age-adjusted hospitalization rates for Crohn's disease and ulcerative colitis were relatively stable throughout the two decades (Chart 2). In 2000/01, the rate for Crohn's disease was 27.5 hospitalizations per 100,000 population—a small increase from 24.7 per 100,000 in 1983/84. The rate for ulcerative colitis was 12.6 per 100,000 population in 2000/01, about the same as the 1983/84 rate of 12.3 per 100,000.

Chart 1
Time to readmission for rehospitalized Crohn's disease and ulcerative colitis patients, Canada excluding territories, 2000/01



Data source: Health Person-Oriented Information Database, 2000/01
Note: Rates of readmission for Crohn's disease and ulcerative colitis patients are based on first rehospitalization in 2000/01 primarily due to same condition.

Chart 2
Age-adjusted hospitalization rates for Crohn's disease and ulcerative colitis, Canada excluding territories, 1983/84 to 2000/01



Data source: Hospital Morbidity Database, 1983/84 to 2000/01
Note: Rates based on records where Crohn's disease or ulcerative colitis was "tabulating diagnosis" (most significant condition causing hospital stay).

Methods

Data source

The data in this article are from Statistics Canada's Hospital Morbidity Database and Health Person-Oriented Information Database. The Hospital Morbidity Database consists of information on hospital separations (discharges or deaths) from most acute care and some psychiatric, chronic and rehabilitation hospitals.²⁷ Each record contains demographic (for example, date of birth, sex, postal code), administrative (for example, scrambled or unscrambled health insurance number, dates of admission and separation), and clinical information (for example, diagnoses). The data are based on the April-to-March fiscal year. Hospital admission data were available for the entire 1983/84 to 2000/01 period; patient-linked data from the Health Person-Oriented Information Database were available only for the years 1994/95 to 2000/01.

Population estimates used to calculate rates were provided by Statistics Canada's Demography Division.

Analytical techniques

Hospital patients often receive several diagnoses. Each record in the Hospital Morbidity Database can contain up to 16 diagnostic codes. Among these, the condition that accounts for the major part of the hospital stay is known as the "tabulating diagnosis." This diagnosis is usually the same as the primary diagnosis, which is the condition listed first in the patient's discharge abstract. In this article, the term "primary diagnosis" is used. In accordance with the *International Classification of Diseases, Ninth Revision (ICD-9)*, Crohn's disease was defined as the presence of diagnostic codes 555.0, 555.1, 555.2 and 555.9; ulcerative colitis, code 556.²⁸ Hospitalization rates for Crohn's disease or ulcerative colitis are based on records in which one of these conditions was the primary diagnosis. As well, a total rate of hospitalization for inflammatory bowel disease (IBD) was calculated based on records with a diagnosis of Crohn's disease or ulcerative colitis among the first five diagnostic codes.

Hospitalization rates were standardized using the indirect method. The hospitalization rates for Canada in 1991 were applied to each province's age- and sex-specific population distribution to generate the number of inpatients that would be expected in the province if it had the same rates as Canada.

Admission and separation dates were used to calculate length of stay (discharge date minus admission date).

Because hospital patients may be admitted and discharged more than once in any year, counts of separations exceed the number of people who were hospitalized. Hospital separation records for each patient were linked, based on a unique patient identifier (patient names are not provided to Statistics Canada) and sorted chronologically to generate a count of inpatients (as opposed to separations). For each patient, admission and separation dates were used to create hospitalization episodes. A yearly count of patients hospitalized for Crohn's disease and for ulcerative colitis was produced starting in 1994/95 (the earliest year for which complete data that enable tracking all hospitalizations in all provinces are available).

Limitations

The Hospital Morbidity Database and the Health Person-Oriented Information Database include only patients who were admitted to hospital. Those treated in hospital but not admitted for an overnight stay are excluded, as are people treated on an outpatient basis, and of course, individuals who receive care in doctors' offices, clinics or other non-hospital settings. Consequently, this article underestimates the true burden of inflammatory bowel disease, as it reflects only the more acute and severely symptomatic cases.

The data pertain primarily to patients in acute care hospitals. Depending on the year and jurisdiction, data for patients in other types of hospitals may or may not be reported. No adjustment was made for these or other excluded patients (military hospitals, prison hospitals, patients treated outside their home province, and patients in the territories).

The extent to which provincial variations in hospitalization rates result from differences in outpatient treatment and management of inflammatory bowel disease is unknown. As well, geographic variations may reflect provincial differences in extraction and coding practices. A patient record can have up to 16 diagnostic codes. The number of codes on a patient's chart varies from year to year and from province to province. To minimize the impact of this inconsistency, this analysis included only the first five diagnostic codes on a patient's discharge abstract. Thus, hospitalizations where inflammatory bowel disease appeared, but ranked lower among the diagnoses, were excluded. This practice may have resulted in some underestimation of IBD hospitalizations.

This stability in rates of hospitalization for Crohn's disease and ulcerative colitis contrasts with the sharp drop in hospitalization rates overall. During the same period, the total hospitalization rate for all reasons fell steadily from 14,426 to 8,947 per 100,000 (see *Trends in hospitalization*). In fact, despite population growth, in 2000/01, there were fewer hospitalizations in Canada (2.86 million) than there had been in 1983/84 (3.62 million). By contrast, the numbers for both Crohn's disease and ulcerative colitis were slightly higher at the end than at the beginning of the period. Consequently, although patient's with Crohn's disease and ulcerative colitis accounted for just 0.4% of all admissions to acute care hospitals in 2000/01, this was up slightly from 0.3% in 1983/84.

Younger patients

Unlike many conditions that necessitate hospitalization and tend to affect older people, IBD hospitalization rates are high among young adults (Chart 3, Appendix Tables A and B).

For Crohn's disease, hospitalization rates peak among people in their twenties, and fall at successively older ages. In 2000/01, the rate for 20- to 29-year-olds was 48 hospitalizations per 100,000 population; for seniors aged 70 or older, 15.4 per 100,000.

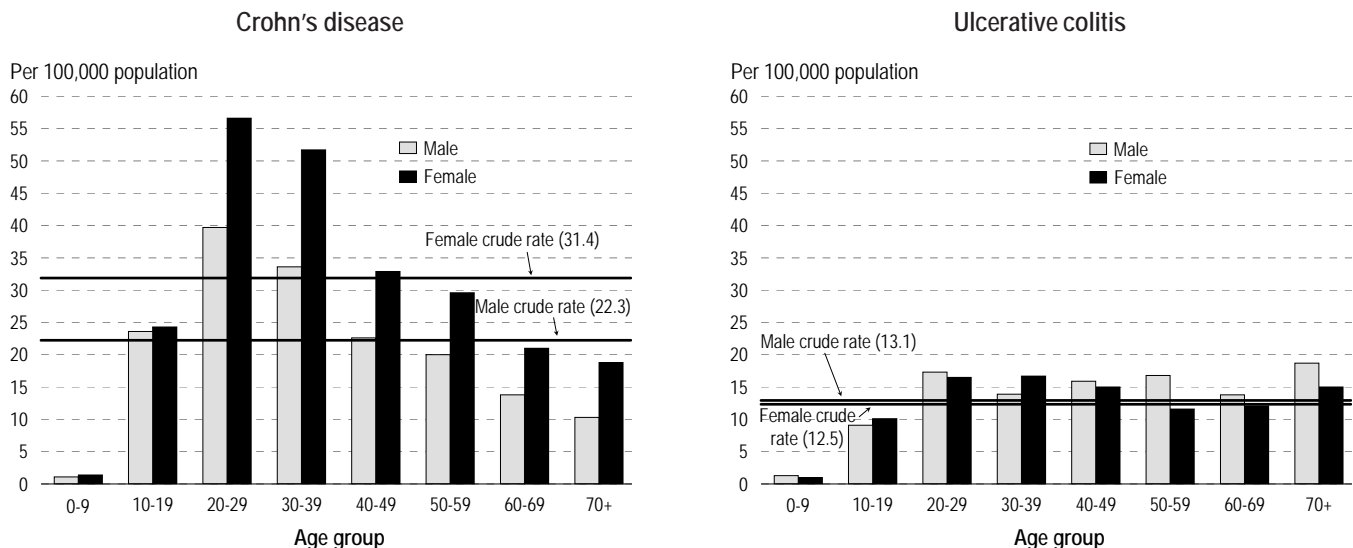
Hospitalization rates for ulcerative colitis vary little after age 20. In 2000/01, the highest rate—16.9 per 100,000—was among people in their twenties, but from ages 30 to 69, rates were not much lower, ranging between 12.9 and 15.5 per 100,000. At age 70 or older, the rate was 16.5 per 100,000, although it is possible that some older patients with ischemic colitis, a condition that mostly affects the elderly, were incorrectly coded as having ulcerative colitis.

Few children are hospitalized with either Crohn's disease or ulcerative colitis. From the early 1980s through 2000/01, hospitalization rates for both conditions among children younger than 10 hovered around 1 per 100,000.

Women's rate higher for Crohn's disease

Women are considerably more likely than men to be hospitalized for Crohn's disease. The rate in 2000/01 was 31.4 hospitalizations per 100,000 females, compared with 22.3 per 100,000 males (Chart 3). Among children and teenagers, rates varied little by sex, but starting among people in their twenties, a difference emerged: 56.5 hospitalizations per 100,000 women in this age range, compared with 39.7 per 100,000 men. This gap persisted in all older age groups.

Chart 3
Age-specific hospitalization rates for Crohn's disease and ulcerative colitis, by sex, Canada excluding territories, 2000/01



Data source: Hospital Morbidity Database, 1983/84 to 2000/01

Hospitalization rates for ulcerative colitis were about the same among males and females. In 2000/01, the rates were 13.1 per 100,000 males and 12.5 per 100,000 females. And for each age group, differences in hospitalization rates between the sexes were small.

In the provinces

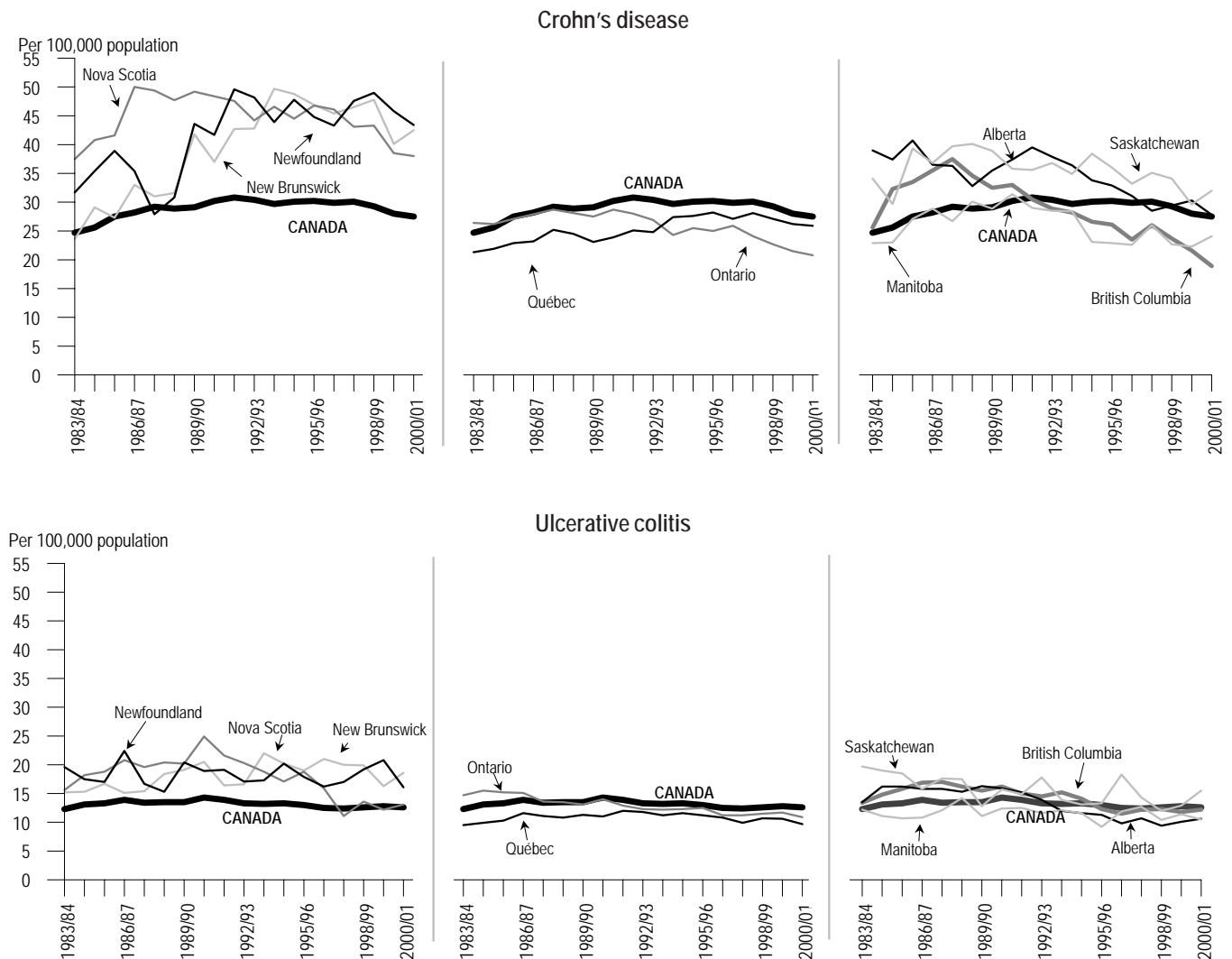
In 2000/01, hospitalization rates for Crohn's disease rates were above the 1983/84 level in the Atlantic provinces, Québec and Manitoba (Appendix Table

C). By contrast, in Ontario, Saskatchewan, Alberta and British Columbia, 2000/01 rates were down from 1983/84.

Throughout the period, Crohn's disease hospitalization rates tended to be high in the Atlantic provinces, Saskatchewan and Alberta, and low in Ontario and Québec (Chart 4). Rates in British Columbia had been well above the national level in the early 1980s, but by the late 1990s, were the lowest in the country.

Chart 4

Age-adjusted hospitalization rates for Crohn's disease and ulcerative colitis, by province,† 1983/84 to 2000/01



Data source: Hospital Morbidity Database, 1983/84 to 2000/01

† Because of low numbers in Prince Edward Island, small changes in annual hospitalizations can produce sharp fluctuations in rates; therefore, data for Prince Edward Island are not shown but are included in national totals (Appendix Table A).

Hospitalization rates for ulcerative colitis were generally high in the Atlantic provinces and Saskatchewan, and low in the other provinces (Appendix Table D).

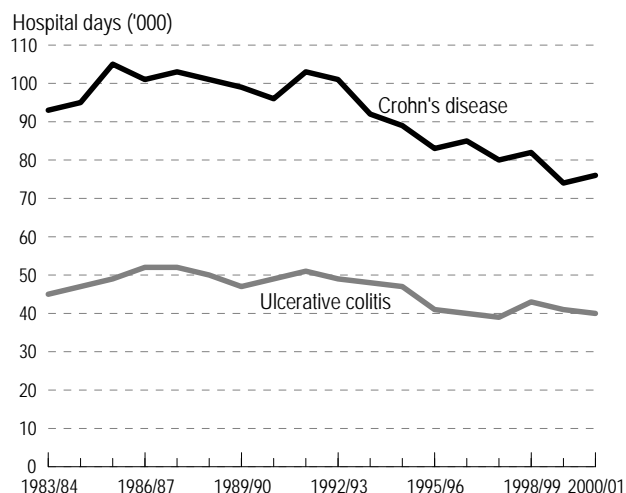
Shorter stays/Fewer days

During the past two decades, hospital stays for IBD have become shorter. In the early 1980s, patients admitted with a primary diagnosis of Crohn's disease or ulcerative colitis stayed an average of about two weeks (Appendix Tables E and F). By 2000/01, the average was 9 or 10 days.

Shorter stays have meant that the annual number of hospital days devoted to the two diseases has fallen (Appendix Tables E and F). In 2000/01, Crohn's disease patients accounted for about 76,000 hospital days, compared with almost 93,000 days in 1983/84 (Chart 5). Close to 40,000 hospital days were attributable to ulcerative colitis in 2000/01, down from nearly 45,000 days in 1983/84.

However, this decline in IBD patient-days was slower than the drop in hospital days overall (see *Trends in hospitalization*). Consequently, as a percentage of all hospital days, those accounted for by Crohn's disease or ulcerative colitis rose from 0.34% to 0.46%.

Chart 5
Annual number of hospital days for Crohn's disease and ulcerative colitis, 1983/84 to 2000/01



Data source: Hospital Morbidity Database, 1983/84 to 2000/01

Trends in hospitalization

Over the past two decades, the likelihood of being admitted to hospital has declined sharply, and those who are admitted now tend to stay less time than would have been the case 20 years ago.

In the 1980s and early 1990s, the annual number of hospitalizations was relatively stable, hovering around 3.7 million. However, since 1991/92, the number has dropped steadily so that in 2000/01, it was 2.9 million. The falling numbers reflect a sharp decline in the overall hospitalization rate, from 14,426 per 100,000 population at the beginning of the period to 8,947 per 100,000 at the end. This suggests that many patients who would once have been admitted are receiving treatment on an outpatient basis, and only the more serious cases are hospitalized. Even so, the average time that patients stay in hospital fell from close to 12 days in the late 1980s to less than 9 days in 2000/01. Lower hospitalization rates and shorter stays have meant that the annual number of days Canadians spent in hospital dropped from over 40 million in the 1980s and early 1990s to just over 25 million in 2000/01.

Total hospital separations, age-adjusted rates, average length of stay and total hospital days, Canada excluding territories, 1983/84 to 2000/01

	Hospital separations			
	Number (millions)	Age-adjusted rate per 100,000 population	Average length of stay (days)	Total hospital days (millions)
1983/84	3.62	14,426	11.3	40.8
1984/85	3.64	14,294	11.4	41.5
1985/86	3.65	14,106	11.7	42.8
1986/87	3.69	14,021	11.7	43.2
1987/88	3.70	13,847	11.9	43.8
1988/89	3.65	13,396	11.9	43.4
1989/90	3.62	13,058	11.4	41.4
1990/91	3.62	12,868	11.4	41.4
1991/92	3.65	12,742	11.4	41.4
1992/93	3.44	11,828	11.0	37.7
1993/94	3.41	11,548	11.0	37.5
1994/95	3.33	11,364	10.9	36.2
1995/96	3.19	10,748	10.8	34.5
1996/97	3.06	10,151	10.7	32.9
1997/98	3.00	9,798	9.9	29.5
1998/99	2.95	9,498	8.6	25.4
1999/00	2.91	9,258	8.7	25.4
2000/01	2.86	8,947	8.8	25.1

Data source: Hospital Morbidity Database, 1983/84 to 2000/01

Beyond the primary diagnosis

Admissions with Crohn's disease or ulcerative colitis as the primary diagnosis give only part of the picture of the impact these conditions have on hospital resources. For example, in 2000/01, Crohn's disease was the primary diagnosis on the patient's discharge abstract for 8,305 hospitalizations, but it was listed second for another 4,207, and third for 1,964. The pattern was the same for ulcerative colitis—3,949 hospitalizations were attributed to the disease, but it was the second diagnosis recorded in another 1,494 admissions, and third in an additional 920.

If hospitalizations with Crohn's disease or ulcerative colitis recorded among the first five diagnoses from a patient's chart are considered together, in 2000/01, the total number amounted to 23,152, and the hospitalization rate was 74.5 per 100,000 population (Appendix Table G). These hospitalizations accounted for 206,095 days, almost twice the total when only primary diagnoses are considered (115,580).

Concluding remarks

Crohn's disease and ulcerative colitis made up less than half of one percent of all hospital separations in 2000/01. However, over the past two decades, IBD hospitalization rates have been relatively stable, in sharp contrast to a steady decline in the overall rate of hospitalization in Canada. As a result, the percentage of all hospitalizations attributable to IBD has risen.

To a considerable degree, the stability of IBD rates reflects a high proportion of readmissions, with about a quarter of patients being hospitalized at least twice within the same year. In an era of cutbacks and efforts to treat more conditions on an ambulatory basis, Crohn's disease and ulcerative colitis seem to be resistant. If people are increasingly treated as outpatients, but a substantial number still require hospital care, this could indicate a rising prevalence of these diseases.

The average length of stay for IBD patients has fallen since the early 1980s, with a consequent drop in patient-days. Even so, this decrease did not keep pace with the drop in patient-days overall, so by 2000/01, the percentage of all hospital days attributable to Crohn's disease and ulcerative colitis was actually higher than in 1983/84.

Provincial variations in IBD hospitalization rates, particularly for Crohn's disease, could result from a combination of several factors. For example, the high rates in the Atlantic region (and to a lesser extent in Saskatchewan) might reflect the substantial proportion of the population living in rural areas. Both conditions require prolonged care and monitoring by a specialist. Because of the distances involved, it may be more difficult to treat rural residents as outpatients, so there may be a tendency to hospitalize those who would need repeated trips for care. The decision to hospitalize an IBD patient may reflect physicians' diagnostic and practice styles, experience, and the availability of alternatives, but such data are not available from the Hospital Morbidity Database or the Health Person-Oriented Information Database. Differences in disease prevalence and severity may also play a role, but again, such information is not available.

In an era of general decline in hospitalization rates, the stability of rates for Crohn's disease and ulcerative colitis suggests that management of the conditions is challenging for both the health care system and for the people diagnosed. Unlike many other patients, those hospitalized—and repeatedly hospitalized—for IBD are often in their twenties and thirties, an important time in family and career development. ●

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Appendix

Table A

Hospital separations and age-specific rates for Crohn's disease, Canada excluding territories, 1983/84 to 2000/01

	Total	Age group							
		0 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70+
Number of separations									
1983/84	6,403	45	952	2,147	1,439	713	477	373	257
1984/85	6,741	38	913	2,365	1,531	694	559	353	288
1985/86	7,313	35	964	2,532	1,705	870	512	358	337
1986/87	7,607	35	1,023	2,554	1,830	885	577	390	313
1987/88	7,948	41	1,096	2,602	1,873	960	599	433	344
1988/89	7,977	42	1,020	2,551	1,913	1,023	595	472	361
1989/90	8,135	31	962	2,592	2,057	1,146	586	448	313
1990/91	8,489	44	1,024	2,704	2,007	1,168	692	475	375
1991/92	8,763	32	980	2,774	2,219	1,277	639	451	391
1992/93	8,731	36	930	2,691	2,262	1,328	630	487	367
1993/94	8,562	35	915	2,606	2,233	1,305	622	484	362
1994/95	8,621	53	864	2,630	2,200	1,379	661	454	380
1995/96	8,720	46	967	2,514	2,309	1,397	663	447	377
1996/97	8,711	34	914	2,400	2,345	1,428	742	475	373
1997/98	8,838	55	1,017	2,391	2,347	1,416	739	454	419
1998/99	8,714	28	1,031	2,176	2,282	1,448	861	479	409
1999/00	8,383	47	975	2,096	2,208	1,398	795	443	421
2000/01	8,305	48	992	2,030	2,132	1,371	896	421	415
Rate per 100,000 population									
1983/84	24.7	1.2	24.1	43.6	35.0	25.3	19.3	18.9	15.1
1984/85	25.6	1.0	23.7	47.9	36.1	23.9	22.7	17.5	16.4
1985/86	27.5	1.0	25.3	50.9	39.0	28.9	20.7	17.3	18.6
1986/87	28.2	0.9	27.0	51.9	41.0	27.9	23.2	18.4	16.7
1987/88	29.2	1.1	28.9	53.6	41.0	28.8	24.0	19.9	17.9
1988/89	28.9	1.1	26.8	52.9	40.6	29.2	23.7	21.3	18.3
1989/90	29.1	0.8	25.2	54.5	42.5	31.3	23.1	19.9	15.3
1990/91	30.2	1.1	26.7	58.3	40.6	30.6	26.8	20.9	17.6
1991/92	30.8	0.8	25.3	60.7	43.8	32.2	24.3	19.6	17.7
1992/93	30.4	0.9	23.8	60.0	43.7	32.4	23.3	21.0	16.1
1993/94	29.7	0.9	23.2	59.7	42.7	30.7	22.2	20.8	15.3
1994/95	30.1	1.3	21.8	61.0	42.3	32.6	23.6	19.6	16.4
1995/96	30.2	1.2	24.1	59.4	44.1	31.8	23.0	19.2	15.9
1996/97	29.9	0.9	22.6	57.2	44.8	31.6	24.8	20.4	15.3
1997/98	30.1	1.4	25.0	57.0	45.2	30.6	23.4	19.4	16.7
1998/99	29.3	0.7	25.2	52.0	44.5	30.7	26.0	20.3	15.9
1999/00	28.0	1.2	23.7	49.8	43.6	28.9	23.0	18.6	16.0
2000/01	27.5	1.3	23.9	48.0	42.5	27.7	24.8	17.5	15.4

Data source: Hospital Morbidity Database, 1983/84 to 2000/01

Note: Rate for total population is age-adjusted.

Table B
Hospital separations and age-specific rates for ulcerative colitis, Canada excluding territories, 1983/84 to 2000/01

	Total	Age group							
		0 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70+
Number of separations									
1983/84	3,102	40	346	757	657	326	336	295	345
1984/85	3,347	46	338	839	681	427	319	343	354
1985/86	3,501	40	371	924	747	413	363	320	323
1986/87	3,689	38	341	975	827	482	338	333	355
1987/88	3,600	37	319	973	787	429	340	332	383
1988/89	3,687	55	358	880	841	495	316	341	401
1989/90	3,749	46	344	955	866	523	304	328	383
1990/91	4,011	56	412	964	941	547	309	379	403
1991/92	3,969	48	362	961	935	545	334	330	454
1992/93	3,856	45	356	921	903	529	324	329	449
1993/94	3,856	52	326	846	948	575	371	341	397
1994/95	3,863	44	351	804	970	579	362	318	435
1995/96	3,832	30	346	798	884	650	340	365	419
1996/97	3,727	25	336	764	872	641	386	320	383
1997/98	3,712	35	368	720	850	641	372	338	388
1998/99	3,850	42	393	695	830	657	470	347	416
1999/00	3,925	38	391	764	876	694	398	304	460
2000/01	3,949	44	396	713	766	764	511	310	445
Rate per 100,000 population									
1983/84	12.3	1.1	8.8	15.4	16.0	11.6	13.6	14.9	20.3
1984/85	13.1	1.3	8.8	17.0	16.1	14.7	12.9	17.0	20.1
1985/86	13.4	1.1	9.7	18.6	17.1	13.7	14.7	15.5	17.8
1986/87	13.9	1.0	9.0	19.8	18.5	15.2	13.6	15.7	19.0
1987/88	13.4	1.0	8.4	20.1	17.2	12.9	13.7	15.3	20.0
1988/89	13.5	1.4	9.4	18.2	17.8	14.1	12.6	15.4	20.3
1989/90	13.5	1.2	9.0	20.1	17.9	14.3	12.0	14.6	18.7
1990/91	14.3	1.4	10.7	20.8	19.0	14.4	12.0	16.7	19.0
1991/92	13.9	1.2	9.4	21.0	18.5	13.8	12.7	14.4	20.6
1992/93	13.3	1.1	9.1	20.6	17.5	12.9	12.0	14.2	19.6
1993/94	13.2	1.3	8.3	19.4	18.1	13.5	13.3	14.7	16.8
1994/95	13.3	1.1	8.9	18.6	18.7	13.7	12.9	13.7	18.8
1995/96	13.1	0.8	8.6	18.8	16.9	14.8	11.8	15.7	17.6
1996/97	12.6	0.6	8.3	18.2	16.7	14.2	12.9	13.7	15.7
1997/98	12.4	0.9	9.0	17.2	16.4	13.9	11.8	14.4	15.5
1998/99	12.6	1.1	9.6	16.6	16.2	13.9	14.2	14.7	16.2
1999/00	12.8	1.0	9.5	18.2	17.3	14.4	11.5	12.8	17.5
2000/01	12.6	1.1	9.6	16.9	15.3	15.5	14.2	12.9	16.5

Data source: Hospital Morbidity Database, 1983/84 to 2000/01

Note: Rate for total population is age-adjusted.

Table C
Hospital separations and age-adjusted rates for Crohn's disease, Canada and provinces, 1983/84 to 2000/01

	Canada [†]	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
Number of separations											
1983/84	6,403	170	21	307	158	1,336	2,269	225	312	902	703
1984/85	6,741	191	22	341	198	1,395	2,310	231	278	875	900
1985/86	7,313	212	28	354	189	1,489	2,463	279	372	973	954
1986/87	7,607	195	35	431	231	1,542	2,615	301	352	874	1,031
1987/88	7,948	156	23	431	220	1,693	2,766	281	381	876	1,121
1988/89	7,977	175	46	424	228	1,688	2,825	320	384	811	1,076
1989/90	8,135	251	30	444	307	1,625	2,842	309	368	906	1,053
1990/91	8,489	244	45	443	277	1,703	3,019	340	340	975	1,103
1991/92	8,763	297	53	444	326	1,828	3,028	319	342	1,060	1,066
1992/93	8,731	290	52	415	328	1,819	2,928	316	356	1,023	1,020
1993/94	8,562	270	41	443	385	2,033	2,682	318	342	1,005	1,036
1994/95	8,621	286	58	422	365	2,050	2,843	259	376	941	1,016
1995/96	8,720	268	59	450	367	2,123	2,849	261	359	942	1,034
1996/97	8,711	258	47	450	361	2,082	3,025	261	337	914	969
1997/98	8,838	283	45	426	374	2,184	2,875	305	364	866	1,103
1998/99	8,714	292	72	436	390	2,147	2,774	270	360	926	1,018
1999/00	8,383	273	53	394	331	2,101	2,688	269	316	982	953
2000/01	8,305	262	46	395	356	2,115	2,677	296	346	928	851
Age-adjusted rate per 100,000 population											
1983/84	24.7	31.7	18.3	37.5	23.6	21.3	26.4	22.9	34.1	39.0	25.6
1984/85	25.6	35.4	18.8	40.8	29.1	21.9	26.2	23.0	29.7	37.4	32.3
1985/86	27.5	38.9	23.4	41.6	27.3	22.9	27.1	27.1	39.3	40.7	33.5
1986/87	28.2	35.4	29.1	50.0	33.0	23.2	27.9	28.9	36.8	36.5	35.5
1987/88	29.2	27.9	18.8	49.4	31.0	25.2	28.7	26.7	39.7	36.3	37.5
1988/89	28.9	30.8	37.0	47.7	31.6	24.5	28.1	30.1	40.1	32.8	34.6
1989/90	29.1	43.6	24.0	49.2	41.8	23.1	27.5	28.9	38.9	35.5	32.5
1990/91	30.2	41.7	35.6	48.4	37.0	23.9	28.7	31.4	35.8	37.4	33.0
1991/92	30.8	49.6	41.2	47.6	42.7	25.1	28.0	29.0	35.6	39.5	30.5
1992/93	30.4	48.2	40.3	44.2	42.8	24.8	26.9	28.5	36.8	37.9	28.9
1993/94	29.7	43.9	31.1	46.6	49.7	27.4	24.3	28.4	34.9	36.4	28.2
1994/95	30.1	47.9	43.5	44.5	48.8	27.6	25.5	23.1	38.4	33.8	26.6
1995/96	30.2	44.8	43.3	46.8	46.9	28.2	25.0	22.9	36.0	32.9	26.1
1996/97	29.9	43.3	33.7	46.1	45.4	27.1	25.9	22.6	33.2	31.1	23.5
1997/98	30.1	47.6	31.7	43.1	46.5	28.2	24.1	26.0	35.1	28.5	26.0
1998/99	29.3	49.0	49.9	43.3	47.8	27.1	22.7	22.7	34.1	29.4	23.7
1999/00	28.0	45.8	36.1	38.5	40.1	26.2	21.5	22.3	29.6	30.3	21.6
2000/01	27.5	43.4	30.7	38.0	42.5	25.9	20.8	24.1	32.0	27.8	18.9

Data source: Hospital Morbidity Database, 1983/84 to 2000/01

† Excludes territories

Table D
Hospital separations and age-adjusted rates for ulcerative colitis, Canada and provinces, 1983/84 to 2000/01

	Canada [†]	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
Number of separations											
1983/84	3,102	99	9	125	99	579	1,238	119	180	291	363
1984/85	3,347	89	13	149	101	612	1,333	111	176	353	410
1985/86	3,501	89	18	158	113	655	1,364	110	175	368	451
1986/87	3,689	118	16	177	104	758	1,399	112	151	362	492
1987/88	3,600	89	24	170	108	735	1,298	128	170	366	512
1988/89	3,687	84	19	181	132	736	1,341	152	170	364	508
1989/90	3,749	114	17	183	140	789	1,351	120	124	404	507
1990/91	4,011	108	22	229	153	785	1,468	137	154	404	551
1991/92	3,969	112	27	204	126	879	1,400	140	149	400	532
1992/93	3,856	101	27	193	128	871	1,336	132	179	368	521
1993/94	3,856	104	17	182	172	843	1,359	139	141	326	570
1994/95	3,863	119	25	166	153	873	1,388	134	134	318	550
1995/96	3,832	106	20	185	151	862	1,443	108	138	319	496
1996/97	3,727	97	16	159	170	846	1,332	141	193	284	483
1997/98	3,712	102	14	113	165	792	1,366	153	154	322	528
1998/99	3,850	116	10	142	167	868	1,446	128	132	295	537
1999/00	3,925	126	17	129	138	869	1,497	142	144	325	533
2000/01	3,949	100	18	142	162	829	1,453	135	176	354	574
Age-adjusted rate per 100,000 population											
1983/84	12.3	19.6	7.9	15.6	15.2	9.5	14.7	12.2	19.7	13.5	13.4
1984/85	13.1	17.5	11.2	18.2	15.3	9.9	15.5	11.1	19.0	16.2	14.8
1985/86	13.4	17.0	15.1	18.8	16.7	10.3	15.2	10.7	18.5	16.2	15.8
1986/87	13.9	22.4	13.3	20.8	15.1	11.6	15.1	10.8	15.8	15.8	16.9
1987/88	13.4	16.7	19.6	19.6	15.4	11.1	13.6	12.1	17.6	15.8	17.0
1988/89	13.5	15.3	15.2	20.4	18.4	10.8	13.5	14.2	17.5	15.3	16.2
1989/90	13.5	20.4	13.4	20.2	19.1	11.3	13.1	11.1	12.8	16.3	15.5
1990/91	14.3	18.9	17.2	24.9	20.5	11.0	14.0	12.4	15.7	15.9	16.2
1991/92	13.9	19.1	20.5	21.6	16.4	12.0	12.9	12.5	14.9	15.2	15.0
1992/93	13.3	17.1	20.4	20.3	16.6	11.8	12.3	11.6	17.8	13.9	14.5
1993/94	13.2	17.3	12.6	18.8	22.0	11.2	12.2	12.1	13.9	12.0	15.2
1994/95	13.3	20.2	18.3	17.1	20.2	11.6	12.3	11.6	13.1	11.6	14.1
1995/96	13.1	17.9	14.3	18.8	19.0	11.2	12.5	9.2	13.3	11.3	12.3
1996/97	12.6	16.2	11.2	15.9	21.0	10.8	11.2	11.9	18.3	9.8	11.5
1997/98	12.4	17.0	9.6	11.1	20.0	9.9	11.2	12.7	14.3	10.7	12.2
1998/99	12.6	19.2	6.7	13.6	19.9	10.7	11.5	10.4	12.0	9.4	12.3
1999/00	12.8	20.8	11.2	12.2	16.3	10.6	11.7	11.4	12.9	10.1	11.8
2000/01	12.6	16.1	11.5	13.1	18.6	9.7	10.9	10.5	15.5	10.6	12.2

Data source: Hospital Morbidity Database, 1983/84 to 2000/01

[†] Excludes territories

Table E
Number of hospital days and average length of stay for Crohn's disease, by age group, Canada excluding territories, 1983/84 to 2000/01

	Total	Age group							
		0 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70+
Number of days									
1983/84	92,567	436	12,454	28,048	19,088	10,282	8,207	7,047	7,005
1984/85	95,489	344	10,748	31,489	19,832	10,311	9,518	5,803	7,444
1985/86	104,961	381	11,681	31,427	23,215	11,443	8,047	9,653	9,114
1986/87	101,366	266	11,395	30,468	23,782	11,144	8,338	7,513	8,460
1987/88	102,567	266	12,552	30,096	24,143	12,604	8,611	7,095	7,200
1988/89	100,589	419	10,330	30,352	23,572	13,016	7,918	7,789	7,193
1989/90	99,372	255	10,129	28,723	23,641	14,100	7,957	6,764	7,803
1990/91	96,015	204	10,644	27,484	21,284	12,514	8,861	7,781	7,243
1991/92	102,928	229	9,248	29,448	24,435	13,928	8,257	6,186	11,197
1992/93	100,503	240	8,960	28,713	23,608	13,715	8,020	6,149	11,099
1993/94	91,611	290	7,874	24,578	22,838	14,788	8,573	6,753	5,919
1994/95	88,577	424	7,179	24,786	21,345	14,291	8,414	6,213	5,926
1995/96	82,768	359	8,266	21,389	21,521	12,934	6,811	5,429	6,061
1996/97	85,196	331	7,547	20,048	20,468	13,399	6,989	5,848	10,569
1997/98	79,896	512	8,523	19,688	19,407	12,636	7,625	5,182	6,325
1998/99	82,054	261	8,223	17,550	20,070	13,692	9,257	5,307	7,696
1999/00	73,600	419	8,347	16,673	18,713	11,582	7,581	4,881	5,406
2000/01	75,709	284	7,675	15,635	16,949	11,678	9,349	4,919	9,222
Average number of days									
1983/84	14.5	9.7	13.1	13.1	13.3	14.4	17.2	18.9	27.3
1984/85	14.2	9.1	11.8	13.3	13.0	14.9	17.0	16.4	25.9
1985/86	14.4	10.9	12.1	12.4	13.6	13.2	15.7	27.0	27.0
1986/87	13.3	7.6	11.1	11.9	13.0	12.6	14.5	19.3	27.0
1987/88	12.9	6.5	11.5	11.6	12.9	13.1	14.4	16.4	20.9
1988/89	12.6	10.0	10.1	11.9	12.3	12.7	13.3	16.5	19.9
1989/90	12.2	8.2	10.5	11.1	11.5	12.3	13.6	15.1	24.9
1990/91	11.3	4.6	10.4	10.2	10.6	10.7	12.8	16.4	19.3
1991/92	11.8	7.2	9.4	10.6	11.0	10.9	12.9	13.7	28.6
1992/93	11.8	8.0	9.4	10.7	11.0	11.0	12.9	14.0	29.1
1993/94	10.7	8.3	8.6	9.4	10.2	11.3	13.8	14.0	16.4
1994/95	10.3	8.0	8.3	9.4	9.7	10.4	12.7	13.7	15.6
1995/96	9.5	7.8	8.5	8.5	9.4	9.3	10.3	12.2	16.1
1996/97	9.8	9.7	8.3	8.4	8.7	9.4	9.4	12.4	28.3
1997/98	9.0	9.1	8.4	8.2	8.3	8.9	10.3	11.5	15.1
1998/99	9.4	9.3	8.0	8.1	8.8	9.5	10.7	11.1	18.7
1999/00	8.8	8.9	8.6	8.0	8.5	8.3	9.6	11.0	12.9
2000/01	9.1	5.8	7.7	7.7	8.0	8.5	10.5	11.7	22.2

Data source: Hospital Morbidity Database, 1983/84 to 2000/01

Table F
Number of hospital days and average length of stay for ulcerative colitis, by age group, Canada excluding territories, 1983/84 to 2000/01

	Total	Age group							
		0 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70+
Number of days									
1983/84	44,888	393	4,367	10,550	8,201	4,447	4,650	5,115	7,165
1984/85	46,585	667	3,981	10,553	8,813	5,894	4,516	5,307	6,854
1985/86	48,786	347	4,006	11,307	9,730	5,432	5,709	5,351	6,904
1986/87	52,000	336	3,859	12,149	10,254	6,571	4,792	5,289	8,750
1987/88	51,537	382	3,450	12,241	10,191	6,674	5,295	5,557	7,747
1988/89	49,638	528	3,576	9,948	10,285	6,457	4,118	5,728	8,998
1989/90	47,287	485	3,862	10,624	10,044	6,634	4,047	4,276	7,315
1990/91	48,971	455	4,128	11,091	10,296	6,998	4,224	5,465	6,314
1991/92	50,578	419	3,662	11,060	10,809	6,378	4,961	4,514	8,775
1992/93	49,072	386	3,460	10,537	10,474	6,222	4,834	4,542	8,617
1993/94	48,379	494	3,448	9,175	10,849	6,922	4,321	4,843	8,328
1994/95	47,066	543	2,973	8,035	9,955	6,693	4,234	8,328	6,308
1995/96	40,930	239	3,097	7,772	8,790	6,790	3,729	4,351	6,163
1996/97	40,354	254	2,952	7,117	8,453	7,260	4,568	3,822	5,930
1997/98	39,142	352	3,346	6,481	8,064	6,280	4,004	4,215	6,400
1998/99	42,686	463	3,611	6,505	7,743	6,492	5,298	4,388	8,186
1999/00	41,125	299	3,633	6,858	8,412	7,201	4,207	3,971	6,546
2000/01	39,871	508	3,605	6,054	6,744	7,136	5,122	3,888	6,817
Average number of days									
1983/84	14.5	9.8	12.6	13.9	12.5	13.6	13.8	17.3	20.8
1984/85	13.9	14.5	11.8	12.6	12.9	13.8	14.2	15.5	19.4
1985/86	13.9	8.7	10.8	12.2	13.0	13.2	15.7	16.7	21.4
1986/87	14.1	8.8	11.3	12.5	12.4	13.6	14.2	15.9	24.7
1987/88	14.3	10.3	10.8	12.6	13.0	15.6	15.6	16.7	20.2
1988/89	13.5	9.6	10.0	11.3	12.2	13.0	13.0	16.8	22.4
1989/90	12.6	10.5	11.2	11.1	11.6	12.7	13.3	13.0	19.1
1990/91	12.2	8.1	10.0	11.5	10.9	12.8	13.7	14.4	15.7
1991/92	12.7	8.7	10.1	11.5	11.6	11.7	14.9	13.7	19.3
1992/93	12.8	8.6	9.8	11.5	11.6	11.8	15.0	13.8	19.2
1993/94	12.6	9.5	10.5	10.8	11.4	12.1	11.7	14.2	20.9
1994/95	12.2	11.5	8.5	10.0	10.3	11.6	11.7	26.2	14.5
1995/96	10.7	8.0	9.0	9.7	10.0	10.4	11.0	11.9	14.7
1996/97	10.8	9.8	8.8	9.3	9.7	11.3	11.8	11.9	15.5
1997/98	10.5	10.0	9.1	9.0	9.5	9.8	10.8	12.5	16.4
1998/99	11.1	11.0	9.2	9.4	9.3	9.9	11.3	12.7	19.7
1999/00	10.5	7.7	9.3	9.0	9.6	10.4	10.6	13.1	14.2
2000/01	10.1	11.8	9.1	8.5	8.8	9.4	10.0	12.5	15.3

Data source: Hospital Morbidity Database, 1983/84 to 2000/01

Table G
Hospital separations and age-specific rates for patients with inflammatory bowel disease,[†] Canada excluding territories, 1983/84 to 2000/01

	Total	Age group							
		0 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70+
Number of separations									
1983/84	14,388	102	1,576	4,199	3,240	1,646	1,391	1,156	1,078
1984/85	15,330	105	1,518	4,654	3,425	1,775	1,418	1,210	1,225
1985/86	16,595	105	1,677	4,951	3,753	2,046	1,516	1,271	1,276
1986/87	17,368	105	1,719	5,006	4,084	2,174	1,570	1,390	1,320
1987/88	17,966	101	1,776	5,188	4,146	2,331	1,579	1,414	1,431
1988/89	18,805	133	1,833	5,155	4,431	2,534	1,616	1,526	1,577
1989/90	19,701	105	1,720	5,248	4,799	2,850	1,576	1,778	1,625
1990/91	21,211	136	1,902	5,592	4,983	3,037	1,864	1,922	1,775
1991/92	21,645	112	1,756	5,627	5,316	3,263	1,891	1,740	1,940
1992/93	21,592	108	1,722	5,502	5,239	3,247	1,918	1,795	2,061
1993/94	22,408	124	1,662	5,402	5,514	3,558	2,109	1,921	2,118
1994/95	23,017	156	1,665	5,367	5,677	3,682	2,218	1,959	2,293
1995/96	23,418	131	1,759	5,156	5,632	3,899	2,303	2,008	2,530
1996/97	22,313	101	1,687	4,872	5,612	3,742	2,255	1,859	2,185
1997/98	22,595	132	1,829	4,807	5,513	3,844	2,329	1,867	2,274
1998/99	22,878	109	1,854	4,474	5,547	3,881	2,726	1,950	2,337
1999/00	22,942	117	1,893	4,559	5,517	3,937	2,708	1,825	2,386
2000/01	23,152	121	1,923	4,352	5,235	4,103	2,961	1,903	2,554
Rate per 100,000 population									
1983/84	56.4	2.8	39.8	85.2	78.8	58.4	56.4	58.4	63.5
1984/85	59.2	2.9	39.3	94.2	80.8	61.2	57.5	60.0	69.6
1985/86	63.0	2.9	44.0	99.6	85.9	68.0	61.2	61.5	70.3
1986/87	65.1	2.8	45.4	101.7	91.5	68.4	63.2	65.6	70.5
1987/88	66.5	2.7	46.9	106.9	90.6	69.8	63.4	65.1	74.6
1988/89	68.5	3.5	48.2	106.9	93.9	72.3	64.2	68.8	79.8
1989/90	70.8	2.7	45.0	110.4	99.2	77.8	62.1	79.1	79.3
1990/91	75.4	3.5	49.5	120.6	100.8	79.7	72.3	84.5	83.5
1991/92	75.9	2.8	45.4	123.0	105.0	82.4	71.9	75.8	87.8
1992/93	74.8	2.7	44.1	122.7	101.2	79.1	70.9	77.5	90.1
1993/94	76.9	3.1	42.1	123.8	105.4	83.7	75.4	82.6	89.6
1994/95	79.4	3.9	42.0	124.4	109.3	87.0	79.3	84.6	99.0
1995/96	79.8	3.3	43.9	121.7	107.6	88.9	79.7	86.4	106.4
1996/97	75.4	2.5	41.7	116.0	107.2	82.7	75.3	79.7	89.6
1997/98	75.5	3.3	45.0	114.7	106.1	83.1	73.7	79.7	90.9
1998/99	75.5	2.8	45.4	106.8	108.1	82.1	82.2	82.8	91.1
1999/00	75.0	3.0	46.1	108.4	108.8	81.5	78.3	76.7	90.7
2000/01	74.5	3.2	46.4	102.9	104.4	83.0	82.1	79.3	94.7

Data source: Hospital Morbidity Database, 1983/84 to 2000/01

Note: Rate for total population is age-adjusted.

[†] Based on records where inflammatory bowel disease was one of the first five diagnostic codes on patient's chart.