

Epidemiology of Crohn's Disease and Ulcerative Colitis in a Central Canadian Province: A Population-based Study

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The aim of this study was to assess the accuracy and utility of administrative health data in identifying persons with inflammatory bowel disease on a population basis and to determine the incidence and prevalence of this disease in the Canadian province of Manitoba. The data from Manitoba Health (the province's single insurer) were used to identify residents with physician and/or hospital contacts for Crohn's disease or ulcerative colitis based on *International Classification of Diseases*, Ninth Revision, Clinical Modification, codes between 1984 and 1995. Of 5,182 eligible individuals, 4,514 were mailed questionnaires and 2,725 responded. Cases were defined as individuals with five or more separate medical contacts with one of these diagnoses or three or more such contacts if they were resident for less than 2 years. The accuracy of the study case definitions was high when compared with either self-report or chart review. The 1989–1994 age- and sex-adjusted annual incidence was 14.6/100,000 for Crohn's disease and 14.3/100,000 for ulcerative colitis. The prevalence of Crohn's disease in 1994 was 198.5/100,000, and that of ulcerative colitis was 169.7/100,000. In conclusion, the authors have successfully established and validated a population-based database of inflammatory bowel disease based on administrative data. The high incidence rates and dynamic epidemiology of inflammatory bowel disease in Manitoba indicate the presence of important environmental risk factors, which warrants further investigation. *Am J Epidemiol* 1999;149:916–24.

colitis, ulcerative; Crohn disease; inflammatory bowel diseases

Inflammatory bowel disease includes Crohn's disease and ulcerative colitis. Since the peak age of onset is the second and third decades of life (1, 2), which are times of physical, emotional, and social maturation, the burden associated with these diseases extends beyond that of simply physical symptoms. The etiology of Crohn's disease and ulcerative colitis is unknown. Familial aggregation and ethnic and racial variations in the incidence of inflammatory bowel disease suggest the existence of intrinsic etiologic factors (1, 2). However, the dynamic epidemiology of these diseases reported from various populations indicates that there are probably also important extrinsic environmental etiologic factors (1, 2). Descriptive epidemiologic

studies have been recommended to promote the development of new etiologic hypotheses and to better define the public health burden of inflammatory bowel disease (1). However, there is a paucity of population-based data on the epidemiology of inflammatory bowel disease in North American populations (1, 2). This may be largely due to the difficulty in accurately identifying all cases within systems in which there are multiple health care providers. We have the unique ability in Manitoba because of the single payer to compile population-based data for inflammatory bowel disease. The purpose of our study was to use comprehensive administrative health data to facilitate the creation of a population-based database of inflammatory bowel disease in Manitoba, Canada.

In this paper, we describe the creation of such a database, including the accuracy of administrative data diagnoses compared with self-report and chart review. We also report estimates of the incidence and prevalence of Crohn's disease and ulcerative colitis in Manitoba.

MATERIALS AND METHODS

Manitoba is a central Canadian province with a population of approximately 1.14 million. The popu-

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Abbreviation: ICD-9-CM, *International Classification of Diseases*, Ninth Revision, Clinical Modification.

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lation is ethnically diverse, and over 60 percent of the residents live in urban areas. The main sources of data for this study were the Manitoba Health insurance databases. To assess the validity of the administrative data, we also used information collected from self-administered questionnaires and medical chart reviews. This study was approved by the University of Manitoba Faculty of Medicine Ethics Committee and the Manitoba Health Access and Confidentiality Committee.

Creation of the inflammatory bowel disease study database

Manitoba Health provides universal health insurance for Manitoba residents. Nonparticipation in the Manitoba Health insurance plan is minimal, since Manitoba residents are not obliged to pay premiums. Computerized records of all physician billing claims and hospitalizations are maintained by Manitoba Health. The large majority of Manitoba physicians practice on a fee-for-service basis. To receive payment for each service rendered, they submit a claim to Manitoba Health. Each physician claim includes the patient's identification, the date of service, the diagnosis, and a service tariff code. The written diagnosis from these claims is coded to three-digit *International Classification of Diseases*, Ninth Revision, Clinical Modification (ICD-9-CM) codes. After each hospital discharge, all Manitoba hospitals submit a discharge abstract, which includes the patient's identification, the dates of admission and discharge, and up to 16 diagnoses, which are coded to the five-digit ICD-9-CM code. The accuracy of these administrative health databases has been demonstrated for a number of conditions (3–6). Manitoba Health also maintains a population registry that is routinely updated with birth and death reports from vital statistics records. The registered population closely matches census estimates (6). Since 1984, the population registry has maintained a unique personal identifier that is included with each physician claim record and hospital discharge abstract and that facilitates the creation of individual longitudinal health care records.

To identify Manitoba residents with inflammatory bowel disease, all physician claims and hospital discharge abstracts from April 1, 1984, through March 31, 1995, were searched for a diagnosis of Crohn's disease (ICD-9-CM code 555) or ulcerative colitis (ICD-9-CM code 556). Any such physician claim or hospital discharge abstract was extracted into a separate file for subsequent analysis. In total, there were 10,541 individuals with at least one medical contact with a diagnosis of Crohn's disease or ulcerative colitis during that time period.

Questionnaire distribution

To facilitate the development and validation of appropriate case definitions based on administrative health records, a self-administered questionnaire was developed for mailed distribution. In addition to demographic data, this questionnaire elicited information on primary diagnosis and method and year of diagnosis. It also included written consent to access medical charts for further diagnostic validation.

A list of eligible questionnaire respondents was developed based on the database containing records of individuals with a medical contact for a diagnosis of inflammatory bowel disease between 1984 and 1995 who still resided in the province at the time of study initiation. Only individuals with at least three separate physician contacts and/or hospitalizations beginning between 1984 and 1992 or at least one such contact beginning in 1993 or later were eligible ($n = 5,182$). Questionnaires were distributed only after assent was obtained from the physician with the most frequent recent contact with the individual for inflammatory bowel disease. A second mailing was done if there was no response to the first (figure 1). Of 420 physicians who had seen at least one eligible participant, 393 (94 percent) were still active practitioners in the province at study initiation. Of these, 361 (92 percent) agreed to review patient lists provided by Manitoba Health to provide their assent.

Chart reviews

A structured review was performed on 448 medical charts selected at random from among questionnaire respondents who provided written consent. The selection of respondents was stratified to ensure the inclusion of persons who reported not having inflammatory bowel disease. Chart reviews were used to assign individuals into one of the following diagnostic categories: 1) definite or probable Crohn's disease; 2) definite or probable ulcerative colitis; 3) definite inflammatory bowel disease, but cannot distinguish between Crohn's disease and ulcerative colitis; and 4) definitely not inflammatory bowel disease. Standard diagnostic criteria were used to define Crohn's disease and ulcerative colitis (7–10). Fistulas, complex perineal disease, or small bowel disease were interpreted as definite features of Crohn's disease versus ulcerative colitis, and surgical findings and/or postoperative histology, when available, were used as the final arbiter if case diagnoses were not clear from preoperative records.

Case definition and validation

A diagnosis of Crohn's disease, ulcerative colitis, or no inflammatory bowel disease was assigned to all

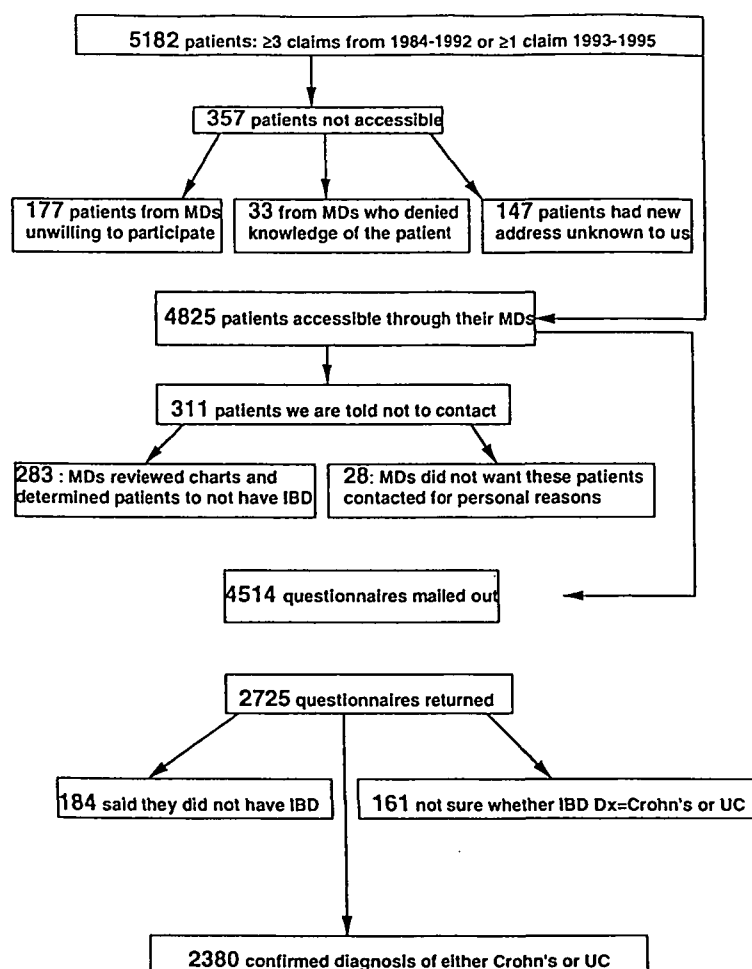


FIGURE 1. Flow chart describing the distribution and return of study questionnaires.

individuals in the administrative database based on the number and periodicity of medical contacts for these conditions. To do this, we used results of the questionnaires as a standard to examine the history of medical contacts of individuals with self-reported Crohn's disease or ulcerative colitis or no inflammatory bowel disease. Criteria were then developed that maximized Youden's index, which gives equal weight to the sensitivity and specificity. As a result of this analysis, individuals who were registered with Manitoba Health for at least 2 years between 1984 and 1995 were classified as having Crohn's disease or ulcerative colitis only if they had had at least five separate medical contacts with such a diagnosis. Individuals who were registered for less than 2 years during the study period were classified as cases if they had had at least three separate medical contacts. Individuals who met the case definition for both Crohn's disease and ulcerative colitis were assigned the majority diagnosis of the nine

most recent medical contacts. The accuracy of these case definitions was then assessed using both self-report and chart review as gold standards.

Incidence and prevalence

To estimate the incidence of Crohn's disease and ulcerative colitis, we examined the longitudinal records of medical contacts for all individuals who met one of the case definitions. The date of first medical contact was considered to be the "diagnosis date." Since both Crohn's disease and ulcerative colitis often run an evanescent course and persons may have a prolonged hiatus of medical contact for these conditions, for the calculation of incidence rates, we analyzed only cases with a first medical contact in 1989 or later. This allowed for a hiatus of at least 5 years in medical contacts. The year of diagnosis reported by questionnaire respondents agreed with that used for the study in 93

percent of cases. The average annual incidence rates per 100,000 were calculated for the years 1989 through 1994 combined. The average annual midyear population estimates based on the Manitoba Health population registry were used for denominators. Individuals were considered to be prevalent cases from the date of the first medical contact until the date their registration was terminated due to death or outmigration. The point prevalence on December 31st was then calculated for each year from 1989 to 1994. Adjustment for age and sex distribution was performed using the direct method with the 1990 Manitoba population as the standard.

RESULTS

Questionnaire response

Figure 1 outlines the questionnaire distribution. A total of 4,514 individuals were mailed questionnaires, and 2,725 (60.4 percent) returned completed questionnaires. Ultimately, three lists of patients were generated: 1) those who responded to the questionnaire, 2) those who were deceased or had left the province, and 3) those whom physicians did not want to be contacted or who did not respond to the mailings.

Case validation (table 1)

For Crohn's disease, 11.1 percent of self-reported cases and 10.8 percent of cases designated by chart review were classified as noncases by the study database case definition, yielding sensitivity estimates of 88.9 and 89.2 percent, respectively. The false-positive rates for the study database case definition compared with self-reports were 8.8 percent, and compared with chart reviews, they were 10.2 percent, yielding specificity estimates of 91.2 and 89.8 percent, respectively. For ulcerative colitis, sensitivity estimates were slightly lower (87.7 percent for self-report and 74.4 percent for chart reviews), and specificity estimates were slightly higher (91.3 percent for self-report and 93.7

percent for chart reviews). Youden's index was high for both Crohn's disease (0.80 for self-report and 0.79 for chart reviews) and ulcerative colitis (0.79 for self-report and 0.68 for chart reviews).

Incidence rates (table 2)

For Crohn's disease, the overall incidence was 14.6/100,000. There was a sharp peak in the incidence rate among those aged 20–29 years (28.4/100,000), followed by those aged 30–39 (17.6/100,000) and 40–49 years (17.3/100,000). With advancing age, there was a steady decline in incidence rates, to 10.7/100,000 among those aged 60 or more years. This age pattern was seen for both females and males, with the highest incidence occurring among females aged 20–29 years (35.8/100,000). Overall, the incidence of Crohn's disease was higher among females (16.9/100,000) than among males (12.3/100,000) with an incidence rate ratio of 1.38 (95 percent confidence interval 1.22–1.57). The incidence of Crohn's disease was higher among females for all ages except those less than age 20 years. Among those aged 10–19 years, the female:male incidence rate ratio was 0.79 (95 percent confidence interval 0.55–1.12).

For ulcerative colitis, the overall incidence rate was 14.3/100,000. The highest incidence was among those aged 20–29 (20.4/100,000) and 30–39 (20.3/100,000) years. However, the incidence rates decreased more gradually with age among females than they did for Crohn's disease, and among males, the incidence rates remained relatively constant with increasing age. The overall incidence was similar among females and males, with a rate ratio of 1.01 (95 percent confidence interval 0.89–1.14).

Prevalence (table 3)

In 1994, the overall point prevalence of Crohn's disease was 198.5/100,000. The peak prevalence was in the age groups 30–39 and 40–49 years (316.2/100,000

TABLE 1. Sensitivity, specificity, and Youden's index of the administrative database case definitions for Crohn's disease and ulcerative colitis using self-report and chart review as gold standards, Manitoba, Canada, 1989–1994

Comparison	Sensitivity	95% CI*	Specificity	95% CI	Youden's index
Crohn's disease					
Self-report	88.9	87.0–90.6	91.2	89.6–92.6	0.80
Chart review	89.2	84.2–92.8	89.8	84.9–93.3	0.79
Ulcerative colitis					
Self-report	87.7	85.8–89.5	91.3	89.7–92.7	0.79
Chart review	74.4	67.3–80.5	93.7	89.9–96.1	0.68

* CI, confidence interval.

TABLE 2. Average annual incidence per 100,000 of Crohn's disease and ulcerative colitis by gender and age group in Manitoba, Canada, 1989–1994

Age group (years)	Females		Males		Rate ratio*	95% CI†	Both	
	Cases	Rate per 100,000	Cases	Rate per 100,000			Cases	Rate per 100,000
Crohn's disease								
<10	3	0.6	4	0.8	0.75	0.18–3.52	7	0.7
10–19	53	11.1	71	14.1	0.79	0.55–1.12	124	12.7
20–29	188	35.8	113	21.1	1.69	1.34–2.14	301	28.4
30–39	117	20.9	82	14.4	1.45	1.09–1.92	199	17.6
40–49	91	20.9	60	13.7	1.53	1.10–2.12	151	17.3
50–59	50	16.7	40	13.5	1.24	0.82–1.88	90	15.1
≥60	82	12.4	43	8.4	1.47	1.02–2.12	125	10.7
Total‡	584	16.9	413	12.3	1.38	1.22–1.57	997	14.6
Ulcerative colitis								
<10	1	0.2	1	0.2	1.05	0.07–16.8	2	0.2
10–19	27	5.7	39	7.8	0.73	0.45–1.19	66	6.7
20–29	115	21.9	101	18.9	1.16	0.89–1.51	216	20.4
30–39	124	22.1	105	18.4	1.20	0.92–1.56	229	20.3
40–49	79	18.2	76	17.3	1.05	0.76–1.44	155	17.7
50–59	56	18.7	60	20.2	0.93	0.64–1.34	116	19.5
≥60	94	14.2	99	19.4	0.73	0.55–0.97	193	16.5
Total‡	496	14.4	481	14.3	1.01	0.89–1.14	977	14.3

* Female:male incidence rate ratio.

† CI, confidence interval.

‡ Overall incidence rates are not age adjusted.

TABLE 3. Prevalence per 100,000 of Crohn's disease and ulcerative colitis by gender and age group in Manitoba, Canada, 1989–1994

Age group (years)	Females		Males		Rate ratio*	95% CI†	Both	
	Cases	Cases per 100,000	Cases	Cases per 100,000			Cases	Cases per 100,000
Crohn's disease								
<10	2	2.4	1	1.2	2.09	0.19–23.1	3	1.77
10–19	30	38.2	60	72.5	0.53	0.34–0.82	90	55.8
20–29	252	311.0	192	233.3	1.33	1.11–1.61	444	271.8
30–39	374	395.2	228	238.1	1.66	1.41–1.96	602	316.2
40–49	302	384.0	220	280.8	1.37	1.15–1.63	522	332.5
50–59	147	283.6	101	196.1	1.45	1.12–1.86	248	240.0
≥60	223	198.9	136	157.5	1.26	1.02–1.56	359	180.9
Total‡	1,330	229.5	938	166.5	1.38	1.27–1.50	2,268	198.5
Ulcerative colitis								
<10	0	0.0	0	0.0			0	0.0
10–19	22	28.0	22	26.6	1.05	0.58–1.90	44	27.1
20–29	103	127.1	125	151.9	0.84	0.64–1.09	228	139.6
30–39	253	267.3	231	241.3	1.11	0.93–1.32	484	254.2
40–49	214	272.1	216	275.7	0.99	0.82–1.19	430	273.9
50–59	136	262.4	144	279.6	0.94	0.74–1.19	280	271.0
≥60	233	207.8	240	278.0	0.75	0.62–0.90	473	238.3
Total‡	961	165.9	978	173.6	0.96	0.87–1.04	1,939	169.7

* Female:male prevalence rate ratio.

† CI, confidence interval.

‡ Overall incidence rates are not age adjusted.

and 332.5/100,000, respectively), which is 1–2 decades later than the peak incidence. In both females and males, there is a steady subsequent decline in prevalence with advancing age. The prevalence of Crohn's disease was substantially higher among females than among males, with an overall prevalence ratio of 1.38 (95 percent confidence interval 1.27–1.50). The female:male prevalence ratio is greater than one for all age groups except 10–19 years, where it is 0.53 (95 percent confidence interval 0.34–0.82).

The overall prevalence of ulcerative colitis in 1994 was 169.7/100,000, with the peak prevalence occurring among those aged 40–49 years (273.9/100,000). As with Crohn's disease, the prevalence subsequently declined with age. However, this decline was much less pronounced. The female:male prevalence ratio was 0.96 (95 percent confidence interval 0.87–1.04). The age- and sex-adjusted prevalence of Crohn's disease increased from 152/100,000 in 1989 to 197/100,000 in 1994. The prevalence of ulcerative colitis increased from 127/100,000 in 1989 to 167/100,000 in 1994 (figure 2).

Because of the notable inversion in the sex ratio in the age group 10–19 years, we examined sex ratios among our questionnaire respondents for cases incident between ages 10 and 19 years by birth cohort (4). For Crohn's disease, the female:male ratio of such cases was 1.43 for those born prior to 1968 and 0.69 ($p = 0.01$) for those born in 1968 and later.

DISCUSSION

Studies of inflammatory bowel disease are prone to underestimation of both the incidence and the prevalence. Although a high proportion of cases will likely seek medical attention at some time, clinical case series may underestimate incidence, particularly if they are restricted to the practices of specialists (11–13). In our study, which included patients detected and managed by all types of physicians, we found that gastroenterologists were routinely following only 60 percent of the patients. Administrative health databases have been used in some North American studies and offer the possibility of a wide capture of diagnosed cases (14–17). However, studies relying on hospitalized cases probably underestimate the incidence, since up to 80 percent of cases may never be hospitalized (14, 18). Other administrative databases, such as those of health maintenance organizations in the United States, are not truly population based and represent only the population they serve (14, 15). Since the Manitoba Health databases capture both the physician and hospital contacts for all residents, our study captured a very high proportion of all cases in the province. Furthermore, since we created longitudinal histories of medical contacts over an 11-year period, we were more likely to capture cases who may have had a hiatus in medical contacts for several years.

Another potential source of bias in epidemiologic studies is the misclassification of disease status. In administrative databases, this may be a serious prob-

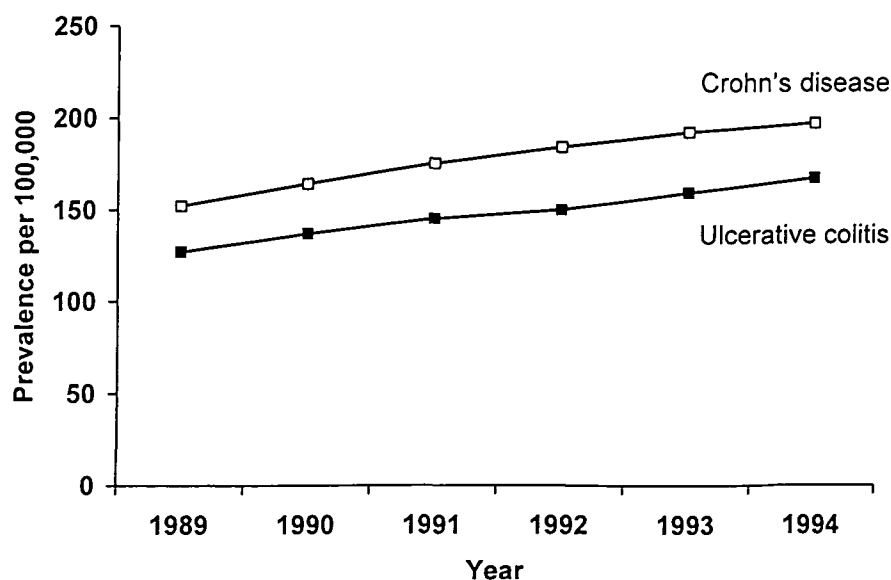


FIGURE 2. The annual age- and sex-adjusted prevalence per 100,000 of Crohn's disease and ulcerative colitis in Manitoba, Canada.

TABLE 4. Sex distribution of cases of Crohn's disease and ulcerative colitis among questionnaire respondents with diagnosis between ages 10 and 19 years, by birth cohort, Manitoba, Canada, 1989–1994

Birth cohorts	Female cases	Male cases	Female: male ratio	
Crohn's disease				
Pre-1958	13	10	1.30	1.43 (pre-1968)
1958-1962	19	14	1.36	
1963-1967	35	23	1.52	
1968-1972	26	22	1.18	0.69* (post-1967)
1973-1977	16	33	0.48	
1978-1982†	4	12	0.33	
Ulcerative colitis				
Pre-1958	11	13	0.85	1.03 (pre-1968)
1958-1962	10	7	1.43	
1963-1967	10	10	1.00	
1968-1972	6	13	0.46	0.88 (post-1967)
1973-1977	16	16	1.00	
1978-1982†	7	4	1.75	

* $p < 0.01$ for comparing sex ratios for birth cohorts before 1968 and 1968 and after.

† Case numbers for 1978–1982 birth cohorts are reduced because they included only cases up to age 16 years.

lem, since diagnosis may be recorded prior to its confirmation. In previous studies, misclassification rates of 10–23 percent have been reported (14, 19, 20). To improve the specificity of our case definition, we required multiple medical contacts for a given diagnosis. The specificity of our study case definition was high in relation to diagnoses based on self-reports and chart reviews, with false-positive rates of 10 percent or less. This may greatly underestimate the true specificity, since we had excluded a priori all individuals in the population who had fewer than three medical contacts prior to 1993 for inflammatory bowel disease. It is possible that those who responded to our questionnaire differed from those who did not with respect to their history of medical contacts. If so, the accuracy of the case definition we chose may be overestimated. We performed a sensitivity analysis to explore the impact of using alternative case definitions with lower sensitivity and specificity on estimates of disease incidence. For example, reducing the minimum number of medical contacts required from five to three reduced the specificity to 79 percent for Crohn's disease and 81 percent for ulcerative colitis, with a resulting increase in the estimated incidence by 20 percent for Crohn's disease and 35 percent for ulcerative colitis. Conversely, increasing the minimum number of contacts required to 10 for Crohn's disease and seven for ulcerative colitis decreased the sensitivity to 84 and 70 percent, respectively. This decreased the estimated

incidence by approximately 19 percent for both Crohn's disease and ulcerative colitis.

The determination of disease onset can also be difficult for inflammatory bowel disease. Symptoms may be present for several years or more prior to diagnosis. In administrative databases, unless prolonged medical histories are available, persons with reactivation of quiescent disease may be misclassified as newly diagnosed cases. Although we allowed for a 5-year hiatus in medical contacts to minimize this source of error in our study, we probably still misclassified some prevalent cases as incident cases, resulting in some overestimation of incidence and an underestimation of prevalence, particularly in earlier years. However, since the year of diagnosis assigned in our database coincided with that reported by questionnaire respondents in 93 percent of cases, it appears that this error was not substantial. Furthermore, the ratios of our prevalence to incidence rates (14 for Crohn's disease and 12 for ulcerative colitis) fall within a range that has been suggested as valid by others (1).

Whereas we report incidence rates for ulcerative colitis that are comparable with some other northern populations (19, 21–25), we report the highest incidence of Crohn's disease to date (1, 2). These observations would hold even if our incidence rates are overestimated by up to 20 percent due to case definition. Studies from the past 15 years in northern European populations have reported Crohn's disease incidence rates of 3.6–9.8/100,000 (11, 12, 21, 22, 26–37). Estimates from southern Europe range from 0.3 to 3.0/100,000 (38–45). Few population-based incidence data are available from North America. A study from northern Alberta, a western Canadian province, reported Crohn's disease incidence rates as high as 10/100,000 in the period of 1977–1981 (13). Reported incidence rates in Olmsted County, Minnesota, for 1984–1993 were 6.9/100,000 (16). Since other North American studies have primarily relied on hospital-based data, they have probably greatly underestimated the incidence rates of Crohn's disease (18, 46–48). The incidence rates of ulcerative colitis from northern Alberta and Olmsted County were 6/100,000 (13) and 7.3/100,000 (17), respectively. The high incidence rates we report may partly reflect the completeness of the case ascertainment in our study or the absence of other recent studies. Nevertheless, our rates are so high relative to elsewhere (particularly for Crohn's disease) that we believe they indicate the presence of some environmental factor(s) in Manitoba that contribute to the high burden of disease. Since Manitoba extends from the 49th to the 60th parallels, this finding also supports the notion that the incidence of this disease is highest among those who live in northern latitudes (7,

49–52). It is also notable that central and western Canada have the highest incidence of multiple sclerosis, a disease that shares many immunologic and clinical similarities with Crohn's disease (53).

Our results suggest that the epidemiology of Crohn's disease in Manitoba is dynamic. Although we do not have incidence estimates for our population from previous time periods, our findings of peak incidence rates among those aged 20–29 years and peak prevalence in the age groups 30–49 years suggest a recent increase in incidence. Since those with Crohn's disease generally have a normal life span, the highest prevalence would be expected in older age groups if incidence rates had been stable for a prolonged time. In contrast, the prevalence of ulcerative colitis did not show a striking early age peak, suggesting that there has not been a comparable recent increase in incidence. These observations are consistent with findings from other populations (1, 2). Sharp increases in the incidence of Crohn's disease in recent decades have been reported from several other populations (2), while some have reported a recent plateauing or slight decline as well (2, 16). In general, other studies have found that the incidence of ulcerative colitis peaked earlier than that for Crohn's disease (1, 2).

We found that the incidence of Crohn's disease, but not of ulcerative colitis, was substantially higher among females than among males. This is consistent with many previous studies (1, 2). However, an interesting finding from our study was an inversion of the sex ratio for Crohn's disease among those aged 10–19 years. Although such a finding could indicate intrinsic age-related factors such as hormonal changes, our data suggest that this was a cohort phenomenon rather than an age phenomenon. As viral and other infectious agents have been proposed as possibly being etiologic for Crohn's disease, further investigation of this phenomenon is warranted (54, 55).

In conclusion, using comprehensive administrative health data, we have created and validated a database of inflammatory bowel disease that permits population-based study of the incidence and prevalence of these diseases in a defined and stable population. Our methodology could be used to conduct similar investigations in other jurisdictions that have population-based administrative health databases. This would allow other Canadian provinces and some countries to apply our case definitions to make modern estimates of the incidence and prevalence of inflammatory bowel disease. Our results show that the central Canadian province of Manitoba has unusually high rates of inflammatory bowel disease. For Crohn's disease, the incidence rate of 14.6/100,000 and prevalence rate of 198.5/100,000 are the highest reported to date.

Evidence of recent changes in the epidemiology of Crohn's disease suggests the existence of potentially important environmental etiologic factors in our population. We are in a position to utilize our database to expand the description of sociodemographic features of inflammatory bowel disease and to generate and pursue etiologic hypotheses. Furthermore, we will also use the database to describe the health care utilization patterns of this population of patients.

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