

Rising hospitalization rates for inflammatory bowel disease in Poland

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KEY WORDS

Crohn's disease, epidemiology, hospitalization rates, inflammatory bowel disease, ulcerative colitis

ABSTRACT

INTRODUCTION The incidence and prevalence of inflammatory bowel disease (IBD) in Poland is unknown.

OBJECTIVES We aimed to define the rates of hospitalization for IBD and time trends in the past 2 decades.

PATIENTS AND METHODS Data were obtained from the database of the National Institute of Public Health (1991–1996 and 2003–2007). Data on hospitalizations for Crohn's disease (CD) and ulcerative colitis (UC) were extracted. Age-, sex-, and disease-specific rates of hospitalization per 100,000 population were calculated.

RESULTS During the years 1991–1996 and 2003–2007, the rate of hospitalization for IBD increased each year, rising from 12.50 to 30.61 per 100,000 population. Rising time trends were observed in both sexes. The hospitalization rate increased from 3.53 to 9.35 per 100,000 population for CD and from 8.97 to 21.26 per 100,000 population for UC. A rising time trend was observed in hospitalizations for CD in men aged from 0 to 39 years. A rising time trend for CD in women was observed between the years 2003 and 2007. The hospitalization rate for UC was higher in men (9.18 to 23.29 per 100,000) than in women (8.77 to 19.37 per 100,000). Rising time trends for UC were observed in the years from 2003 to 2007 in all men and women except for those aged from 40 to 64 years.

CONCLUSIONS Hospitalization rates for IBD in Poland increased from 1991 to 1996 and from 2003 to 2007, with rising time trends in both sexes. For CD, the rising time trend in men was limited to younger age groups. The hospitalization rate for UC was significantly higher in men than in women.

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INTRODUCTION Inflammatory bowel diseases (IBD), encompassing ulcerative colitis (UC), Crohn's disease (CD), and indeterminate colitis (IC), are characterized by chronic inflammation of the gastrointestinal tract. Although the etiology of IBD has been extensively studied, its pathogenesis is not fully understood. IBD patients are genetically predisposed to a deregulated interaction between commensal bacteria and the intestinal mucosal immune system. Some environmental factors are likely to trigger the initial presentation and recurrent episodes of the disease.^{1,2}

A considerable variation in the epidemiology of IBD has been observed worldwide. IBD is believed to be associated with industrialization; the highest incidence and prevalence of IBD are reported in North America and Europe. The incidence of IBD may be rising in developing countries as they become industrialized.³

In a recent analysis of population studies, the highest annual incidence of UC were 24.3 per 100,000 person-years in Europe, 6.3 per 100,000 person-years in Asia and the Middle East, and 19.2 per 100,000 person-years in North America.⁴ The highest annual incidence of CD was 12.7 per 100,000 person-years in Europe, 5.0 per 100,000 person-years in Asia and the Middle East, and 20.2 per 100,000 person-years in North America. The highest reported prevalence values for IBD were in Europe (UC: 505 per 100,000 persons in Norway; CD: 322 per 100,000 persons in Italy) and North America (UC: 249 per 100,000 persons; CD: 319 per 100,000 persons; both in Canada). In time-trend analyses, 75% of studies on CD and 60% of studies on UC exhibited an increasing incidence of statistical significance. Accordingly, rising hospitalization rates have been reported in many United States and

TABLE 1 Total number of hospitalizations for ulcerative colitis and Crohn's disease as well as respective hospitalization rates per 100,000 individuals in Poland, 1991–1996 and 2003–2007

Year	Population ($\times 10^3$)	Number of hospitalizations (UC)	Hospitalization rate /10 ⁵ (UC)	Number of hospitalizations (CD)	Hospitalization rate /10 ⁵ (CD)	Total number of hospitalizations (UC + CD)	Hospitalization rate /10 ⁵ (UC + CD)
1991	38,244.5	3430	8.97	1350	3.53	4780	12.50
1992	38,364.7	4050	10.56	1690	4.41	5740	14.96
1993	38,459.0	3980	10.35	1580	4.11	5560	14.46
1994	38,543.6	4130	10.72	1770	4.59	5900	15.31
1995	38,587.6	4170	10.81	1890	4.90	6060	15.70
1996	38,618.0	4390	11.37	2070	5.36	6460	16.73
2003	38,195.2	6287	16.46	1835	4.8	8122	21.26
2004	38,180.3	7183	18.81	2127	5.57	9310	24.38
2005	38,161.3	8139	21.33	2690	7.05	10,829	28.38
2006	38,132.3	7992	20.96	3359	8.81	11,351	29.77
2007	38,116.0	8105	21.26	3562	9.35	11,667	30.61

Abbreviations: CD – Crohn's disease, UC – ulcerative colitis

TABLE 2 Age-specific hospitalization rates both for Crohn's disease and ulcerative colitis in men and women in Poland, 1991–1996 and 2003–2007

Year	Men (age, y)					Women (age, y)				
	0–16	17–29	30–39	40–64	≥65	0–16	17–29	30–39	40–64	≥65
1991	4.74	8.07	12.32	20.51	23.22	4.97	7.81	16.58	19.07	16.32
1992	8.10	9.44	13.16	23.84	31.51	5.01	7.75	19.11	21.65	22.40
1993	6.72	11.57	13.12	20.68	24.92	4.50	9.41	12.70	26.99	18.83
1994	6.07	6.67	11.80	24.86	30.02	5.36	7.24	20.68	25.14	24.21
1995	8.51	8.47	15.17	18.26	26.69	6.68	10.53	18.88	26.46	25.18
1996	9.69	11.50	17.06	20.49	40.49	8.70	6.97	14.19	25.69	25.02
2003	8.93	19.41	21.32	29.64	35.45	8.44	17.47	20.74	25.54	27.74
2004	8.91	24.20	27.76	32.35	38.43	9.01	20.91	25.58	29.14	29.68
2005	12.61	28.82	33.46	35.50	43.71	11.69	25.74	31.03	32.24	32.26
2006	24.21	32.22	31.02	33.34	40.38	18.86	28.72	28.96	29.83	32.65
2007	23.78	35.11	33.79	33.45	40.70	20.63	29.46	30.45	30.31	31.19

European studies,^{5–10} with a remarkable exception for the Canadian population.¹¹

The epidemiology of IBD in Eastern Europe has not been extensively studied. Most reports present retrospective studies and hospital registries. In 1 prospective study from Croatia performed between 1980 and 1989, the annual incidence of UC was 1.5 per 100,000 persons and that of CD was 0.7 per 100,000 persons, with the prevalence of 21.4 and 8.3 per 100,000 persons, respectively.¹² A population study from Hungary that compared the incidence of IBD in the years from 1977 to 1981 and from 1997 to 2001 reported a significant increase both for UC (from 1.7 to 11.0 per 100,000 individuals) and CD (from 0.4 to 4.7 per 100,000 individuals).¹³ The prevalence of UC and CD in Hungary in 2001 was 142.6 and 52.9 per 100,000 persons, respectively, a few-fold less than in the regions of the highest prevalence.¹³ In a more recent Hungarian population study, the incidence rate of IBD was close to that observed in Western countries.¹⁴

The only Polish prospective study on IBD epidemiology was performed on a pediatric population. The authors registered all new IBD outpatients

who were seen in 24 pediatric gastroenterology centers servicing the whole population of Poland in the years from 2002 to 2004. The overall annual IBD incidence in this study was 2.7 per 100,000 children.¹⁵ In the absence of long-term prospective data on IBD incidence in Poland, one cannot attempt to determine any epidemiological time trends. Furthermore, we are unaware of any ongoing or planned national studies on this subject. Considering all of the above, we decided to make use of the existing data to define the rates of hospitalization for CD and UC in Poland and to identify time trends during the last 2 decades.

PATIENTS AND METHODS The study included data extracted from the National Institute of Public Health (NIPH). Its database covers the epidemiological data on the population of Poland. The database is based on reports from all health care institutions, which are obliged by legal regulations to send them. Before 2001, the NIPH collected data on 1 of 6 hospitalizations. The data included diagnoses but did not allow for the identification of patients. Since 2001, data concerning all hospitalizations in Poland have been collected,

TABLE 3 Poisson regression analysis and coefficients of trends in hospitalization rates for Crohn's disease and ulcerative colitis by age and sex in the years 1991–1996 and 2003–2007

CD and UC		Men			Women		
		B ^a	SE ^b	P value	B ^a	SE ^b	P value
1991–1996							
age groups, y	0–16	0.10	0.01	0.0000	0.12	0.01	0.0000
	17–29	0.03	0.01	0.03	0.01	0.01	0.7
	30–39	0.06	0.01	0.0000	–0.01	0.01	0.53
	40–64	–0.02	0.01	0.01	0.05	0.01	0.0000
	≥65	0.08	0.01	0.0000	0.07	0.01	0.0000
2003–2007							
age groups, y	0–16	0.30	0.01	0.0000	0.26	0.01	0.0000
	17–29	0.14	0.01	0.0000	0.13	0.01	0.0000
	30–39	0.09	0.01	0.0000	0.08	0.01	0.0000
	40–64	0.03	0.01	0.0003	0.03	0.01	0.0000
	≥65	0.03	0.01	0.007	0.03	0.01	0.002
CD		men			women		
		B ^a	SE ^b	P value	B ^a	SE ^b	P value
1991–1996							
age groups, y	0–16	0.15	0.02	0.0000	0.01	0.02	0.65
	17–29	0.17	0.03	0.0000	–0.07	0.03	0.02
	30–39	0.24	0.03	0.0000	–0.03	0.02	0.2
	40–64	–0.06	0.01	0.0000	0.08	0.01	0.0000
	≥65	0.08	0.02	0.0001	0.16	0.02	0.0000
2003–2007							
age groups, y	0–16	0.36	0.02	0.0000	0.37	0.02	0.0000
	17–29	0.20	0.02	0.0000	0.18	0.02	0.0000
	30–39	0.21	0.02	0.0000	0.14	0.02	0.0000
	40–64	0.09	0.02	0.0000	0.10	0.02	0.0000
	≥65	–0.02	0.03	0.61	0.07	0.02	0.003
UC		men			women		
		B ^a	SE ^b	P value	B ^a	SE ^b	P value
1991–1996							
age groups, y	0–16	0.06	0.02	0.001	0.21	0.02	0.0000
	17–29	–0.02	0.02	0.13	0.03	0.02	0.06
	30–39	0.01	0.01	0.42	0.00	0.01	0.99
	40–64	0.00	0.01	0.67	0.04	0.01	0.0000
	≥65	0.07	0.01	0.0000	0.02	0.01	0.07
2003–2007							
age groups, y	0–16	0.25	0.02	0.0000	0.18	0.02	0.0000
	17–29	0.11	0.01	0.0000	0.10	0.01	0.0000
	30–39	0.05	0.01	0.0000	0.06	0.01	0.0002
	40–64	0.01	0.01	0.12	0.01	0.01	0.07
	≥65	0.04	0.01	0.002	0.02	0.01	0.04

a B – Poisson's regression coefficient

b SE – standard error of B

Abbreviations: see [TABLE 1](#)

including the demography of patients, diagnoses at discharge according to the International Classification of Diseases, medical procedure codes, and concomitant diseases.

The study used data on the population of Poland and hospitalization rates during the years

1991–1996 and 2003–2007. Owing to a reorganization of the health care system in Poland and the transition from the old system of collecting data on hospitalizations to the new one, data from 1996 to 2002 were incomplete and were excluded from the analysis.

TABLE 4 Hospitalization rates for Crohn's disease and ulcerative colitis in men and women in Poland, 1991–1996 and 2003–2007

Year	Men			Women			Women/ men ratio	95% CI	P value
	population ($\times 10^3$)	number of hospitaliza- tions (CD + UC)	hospitalization rate/10 ⁵ (CD + UC)	population	number of hospitaliza- tions (CD + UC)	hospitalization rate/10 ⁵ (CD + UC)			
1991	18,633.5	2300	12.34	19,611.0	2480	12.65	1.02	0.97–1.08	>0.1
1992	18,685.9	2870	15.36	19,678.9	2870	14.58	0.95	0.90–1.00	0.05
1993	18,726.1	2630	14.04	19,733.0	2930	14.85	1.06	1.00–1.11	0.04
1994	18,763.1	2700	14.39	19,780.4	3200	16.18	1.12	1.07–1.18	<0.0001
1995	18,779.3	2610	13.90	19,808.3	3450	17.42	1.25	1.19–1.32	<0.0001
1996	18,789.2	3200	17.03	19,828.8	3260	16.44	0.97	0.92–1.01	>0.1
2003	18,493.0	4121	22.28	19,702.2	4001	20.31	0.91	0.87–0.95	<0.0001
2004	18,478.4	4721	25.55	19,701.9	4589	23.29	0.91	0.88–0.95	<0.0001
2005	18,460.7	5511	29.85	19,700.6	5318	26.99	0.90	0.87–0.94	<0.0001
2006	18,436.1	5838	31.67	19,696.2	5513	27.99	0.88	0.85–0.92	<0.0001
2007	18,417.1	6030	32.74	19,698.9	5637	28.62	0.87	0.84–0.91	<0.0001

Abbreviations: CI – confidence interval, others – see [TABLE 1](#)

TABLE 5 Hospitalization rates for Crohn's disease in men and women in Poland, 1991–1996 and 2003–2007

Year	Men			Women			Women/ men ratio	95% CI	P value
	population ($\times 10^3$)	number of hospitaliza- tions (CD)	hospitalization rate/10 ⁵ (CD)	population	number of hospitaliza- tions (CD)	hospitalization rate/10 ⁵ (CD)			
1991	18,633.5	590	3.17	19,611.0	760	3.88	1.22	1.10–1.36	<0.0001
1992	18,685.9	800	4.28	19,678.9	890	4.52	1.06	0.96–1.16	>0.1
1993	18,726.1	740	3.95	19,733.0	840	4.26	1.08	0.98–1.19	>0.1
1994	18,763.1	840	4.48	19,780.4	930	4.70	1.05	0.96–1.15	>0.1
1995	18,779.3	780	4.15	19,808.3	1110	5.60	1.35	1.23–1.48	<0.0001
1996	18,789.2	1020	5.43	19,828.8	1050	5.30	0.98	0.89–1.06	>0.1
2003	18,493.0	841	4.55	19,702.2	994	5.05	1.11	1.01–1.22	0.03
2004	18,478.4	1022	5.53	19,701.9	1105	5.61	1.01	0.93–1.10	>0.1
2005	18,460.7	1297	7.03	19,700.6	1393	7.07	1.01	0.93–1.09	>0.1
2006	18,436.1	1652	8.96	19,696.2	1707	8.67	0.97	0.90–1.03	>0.1
2007	18,417.1	1740	9.45	19,698.9	1822	9.25	0.98	0.92–1.05	>0.1

Abbreviations: see [TABLES 1](#) and [5](#)

We identified all hospital discharges with a primary diagnosis of IBD (coded as 555.xx for CD and 556.xx for UC) reported between 1991 and 1996. The International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) diagnostic codes were used to identify the diagnoses.¹⁶ As already mentioned, during this period, only 1 of every 6 discharges was registered; therefore, we multiplied the number of reported hospitalizations for UC and CD by the factor of 6. We also identified all hospital discharges with a primary diagnosis of IBD and coded as K50 (for CD) and K51 (for UC) reported between 2003 and 2007. The International Classification of Diseases, 10th Revision, Clinical Modification (ICD-10-CM) diagnostic codes were used to identify diagnoses from this period.¹⁷

Statistical methods Hospitalization rates per 100,000 individuals were calculated for the total population and separately for age and sex

subgroups by dividing the number of hospitalizations by the size of the population. Differences between men and women and linear trends for the year of hospitalization were assessed for the years from 1991 to 1996 and from 2003 to 2007 using Poisson regression with sex or year as a covariate. The Stata 12 software was used (StataCorp, 2011, Stata: Release 12, Statistical Software, College Station, TX: StataCorp LP). A P value of less than 0.05 was considered statistically significant.

RESULTS General findings The total number of hospitalizations with a primary diagnosis of CD or UC at discharge and the rates of hospitalization because of CD or UC per 100,000 individuals from 1991 to 1996 and from 2003 to 2007 are presented in [TABLE 1](#). Each consecutive year, the rates of hospitalizations for IBD were higher than during the previous year, increasing from 4780 in 1991 to 11,667 in 2007 (a 2.4-fold increase). Each

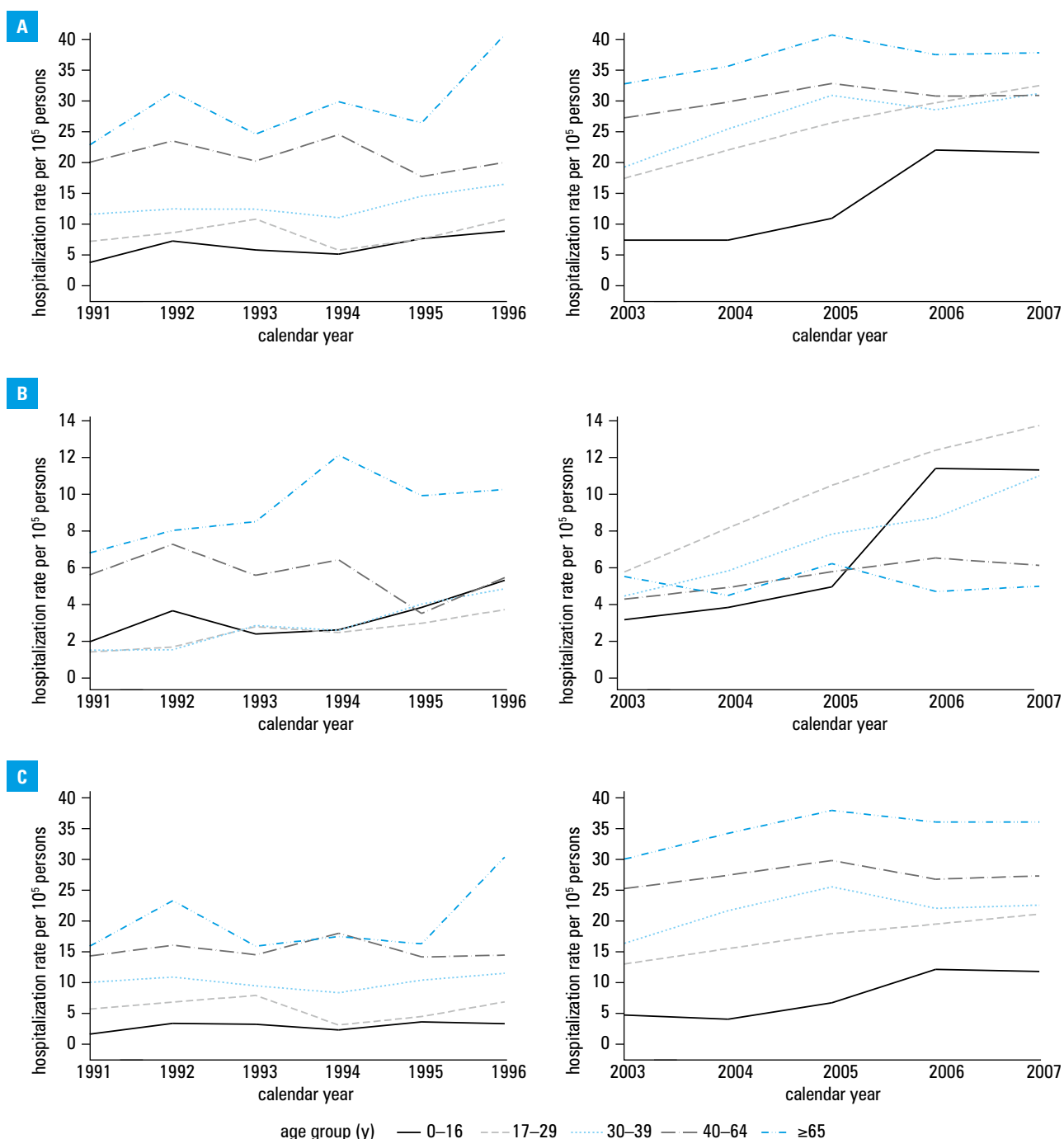


FIGURE 1 **A** – time trends in hospitalization rates for Crohn’s disease and ulcerative colitis by age in men in Poland, 1991–1996 and 2003–2007; **B** – time trends in hospitalization rates for Crohn’s disease by age in men in Poland, 1991–1996 and 2003–2007; **C** – time trends in hospitalization rates for ulcerative colitis by age in men in Poland, 1991–1996 and 2003–2007

year, the rate of hospitalizations for UC was a few times higher than for CD.

Hospitalization rates for either CD or UC in men and women according to age are presented in [TABLE 2](#). The results of the Poisson regression analysis and coefficients of trends in hospitalization rates are presented in [TABLE 3](#). Rising time trends were observed in both sexes ([FIGURES 1A](#) and [2A](#)). The steepest curves were observed in the youngest age groups (0–16 and 17–29 years of age). In most years, the hospitalization rate for IBD was significantly higher for men than for women ([TABLE 4](#)).

Hospitalization rates for Crohn’s disease Sex

The hospitalization rates for CD during the analyzed periods ranged from 3.17 to 9.45 per 100,000 for men compared with 3.88 to 9.25 per 100,000 for women ([TABLE 5](#)). In 3 of 11 years, women were considerably more likely to be hospitalized for CD than men; no difference was observed in the remaining years.

Age Age-specific rates of hospitalization for CD in men and women are presented in [TABLE 6](#). Rising time trends were observed in men in age groups: 0–16, 17–29, and 30–39 years of age. Between the years

TABLE 6 Age-specific hospitalization rates for Crohn's disease in men and women in Poland, 1991–1996 and 2003–2007

Year	Men (age, y)					Women (age, y)				
	0–16	17–29	30–39	40–64	≥65	0–16	17–29	30–39	40–64	≥65
1991	2.01	1.44	1.54	5.63	6.83	2.29	2.40	4.69	5.18	5.30
1992	3.68	1.72	1.57	7.29	8.05	3.08	2.38	4.46	6.18	6.80
1993	2.43	2.82	2.88	5.60	8.53	1.95	2.35	1.63	7.86	6.67
1994	2.65	2.50	2.62	6.45	12.14	2.98	1.45	7.00	5.63	7.68
1995	3.87	3.00	4.05	3.54	9.93	2.02	2.28	5.49	7.44	12.78
1996	5.34	3.74	4.88	5.49	10.27	2.90	1.67	2.13	8.51	10.67
2003	3.20	5.78	4.48	4.31	5.54	2.74	5.76	6.44	5.38	5.21
2004	3.87	8.18	5.85	4.95	4.51	2.83	6.95	7.26	5.70	5.68
2005	4.98	10.49	7.85	5.80	6.24	4.85	8.41	8.44	7.25	6.45
2006	11.41	12.40	8.74	6.55	4.73	8.15	10.94	10.70	7.01	8.08
2007	11.34	13.74	11.01	6.15	5.02	10.28	11.64	10.86	8.12	6.12

TABLE 7 Hospitalization rates for ulcerative colitis in men and women in Poland, 1991–1996 and 2003–2007

Year	Men			Women			Women/men ratio	95% CI	P value
	population (× 10 ³)	number of hospitalizations (UC)	hospitalization rate/10 ⁵ (UC)	population	number of hospitalizations (UC)	hospitalization rate/10 ⁵ (UC)			
1991	18,633.5	1710	9.18	19,611.0	1720	8.77	0.96	0.89–1.02	>0.1
1992	18,685.9	2070	11.08	19,678.9	1980	10.06	0.91	0.85–0.97	0.002
1993	18,726.1	1890	10.09	19,733.0	2090	10.59	1.05	0.99–1.12	>0.1
1994	18,763.1	1860	9.91	19,780.4	2270	11.48	1.16	1.09–1.23	<0.0001
1995	18,779.3	1830	9.74	19,808.3	2340	11.81	1.21	1.14–1.29	<0.0001
1996	18,789.2	2180	11.60	19,828.8	2210	11.15	0.96	0.91–1.02	>0.1
2003	18,493.0	3280	17.74	19,702.2	3007	15.26	0.86	0.82–0.90	<0.0001
2004	18,478.4	3699	20.02	19,701.9	3484	17.68	0.88	0.84–0.93	<0.0001
2005	18,460.7	4214	22.83	19,700.6	3925	19.92	0.87	0.84–0.91	<0.0001
2006	18,436.1	4186	22.71	19,696.2	3806	19.32	0.85	0.81–0.89	<0.0001
2007	18,417.1	4290	23.29	19,698.9	3815	19.37	0.83	0.80–0.87	<0.0001

Abbreviations: see TABLES 1 and 5

1991 and 1996, decreasing time trends were observed in the age group of 17 to 29 years in women and 60 to 64 years in men (TABLE 3). The greatest increase in the hospitalization rate was observed in those aged from 17 to 29 years.

During the first analyzed period (1991–1996), the older the subgroup was, the higher the observed hospitalization rate. During the latter period (2003–2007), the hospitalization rate for CD peaked in the third decade of life in men and in the fourth decade of life in women.

FIGURE 1B presents trends in hospitalization rates for CD from 1991 to 1996 and from 2003 to 2007 in men. FIGURE 2B presents trends in hospitalization rates for CD from 1991 to 1996 and from 2003 to 2007 in women.

Hospitalization rates for ulcerative colitis Sex Men were considerably more likely to be hospitalized with UC than women (TABLE 7). The hospitalization rate during the analyzed period ranged from 9.18 to 23.29 per 100,000 for men and from 8.97 to 19.37 per 100,000 for women.

Age Age-specific rates of hospitalization for UC in men and women are presented in TABLE 8. Rising time trends were observed during the years from 2003 to 2007 in both sexes in all age groups except in those aged from 40 to 64 years (TABLE 3). Similarly to CD, the highest increase in hospitalization rates was observed in those aged from 17 to 29 years. As a general rule, the older the subgroup was, the higher the hospitalization rate was observed. The highest hospitalization rates were observed in the elderly population.

FIGURE 1C presents the trends in hospitalization rates for UC from 1991 to 1996 and from 2003 to 2007 in men. FIGURE 2C presents the trends in hospitalization rates for UC from 1991 to 1996 and from 2003 to 2007 in women.

Length of hospital stay The length of hospital stay was reported in the years from 2003 to 2007. Both for CD and UC, the mean length of stay was progressively shorter each year: during each consecutive year, the mean length of stay was 10.2, 9.7, 8.8, 8.2, and 7.9 days, respectively, for

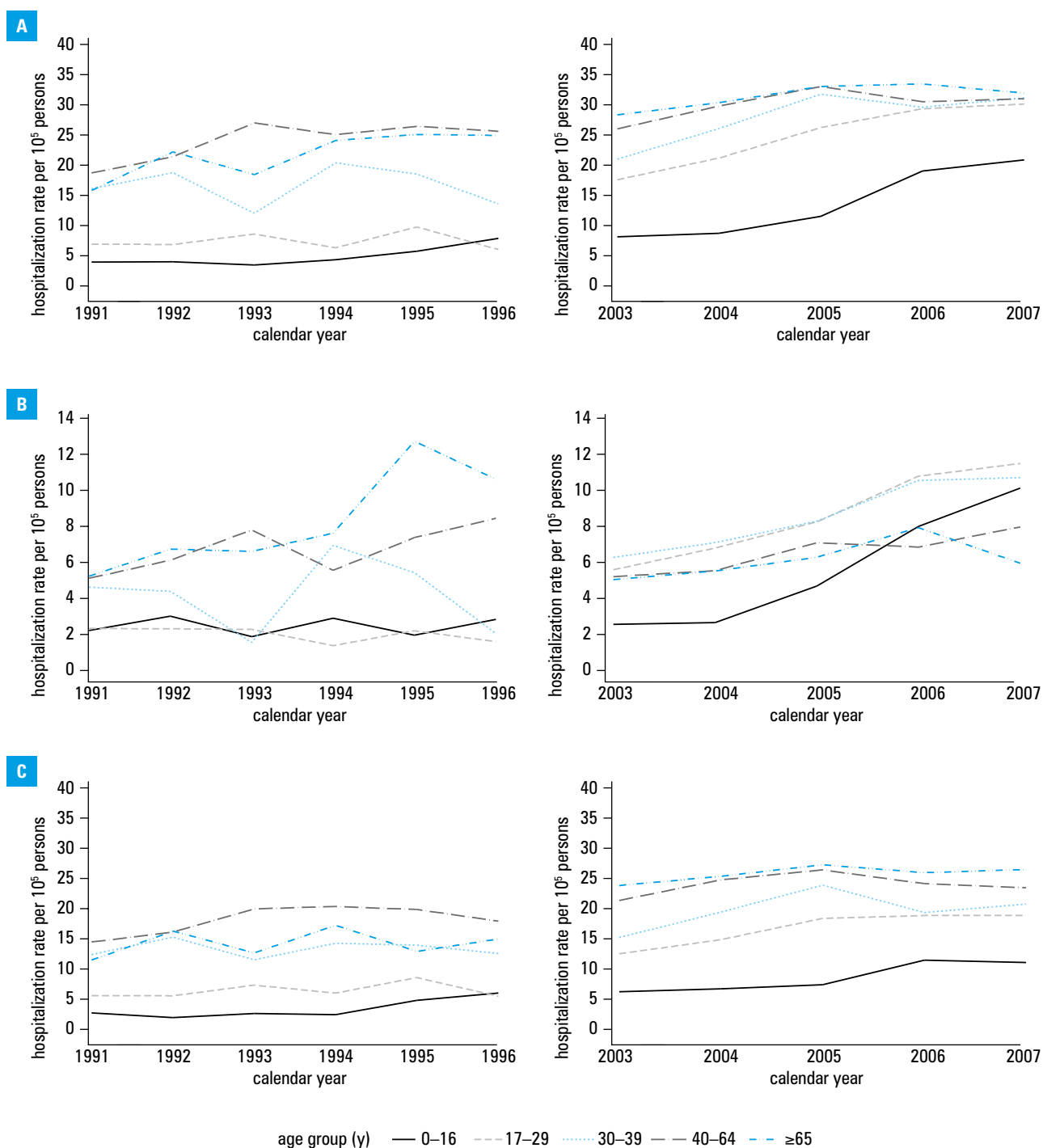


FIGURE 2 **A** – time trends in hospitalization rates for Crohn’s disease and ulcerative colitis by age in women in Poland, 1991–1996 and 2003–2007; **B** – time trends in hospitalization rates for Crohn’s disease by age in women in Poland, 1991–1996 and 2003–2007; **C** – time trends in hospitalization rates for ulcerative colitis by age in women in Poland, 1991–1996 and 2003–2007

CD, and 8.5, 7.0, 6.7, 6.8, and 6.5 days, respectively, for UC.

DISCUSSION Using nationwide hospital discharge data, we showed that the rate of hospitalization for IBD in Poland rose significantly between 1991 and 2007 in all age groups. Our study indicates that the rate of hospitalization for IBD increased approximately 2.4-fold within less than 2 decades. The overall hospitalization rate for CD in Poland increased from 3.53 to 9.35 per

100,000 population, and that for UC increased from 8.97 to 21.26 per 100,000 population.

It is possible that this increase reflects the growing awareness of the disease and its pathophysiology as well as improved diagnostic skills and tools, including wider access to colonoscopy and, more recently, implementation of capsule endoscopy and enterography using computed tomography or magnetic resonance.^{18–21} Another (and likely more important) reason for the observed rise in IBD hospitalization rates is

TABLE 8 Age-specific hospitalization rates for ulcerative colitis in men and women in Poland, 1991–1996 and 2003–2007

Year	Men (age, y)					Women (age, y)				
	0–16	17–29	30–39	40–64	≥65	0–16	17–29	30–39	40–64	≥65
1991	2.74	6.63	10.78	14.88	16.39	2.67	5.41	11.89	13.89	11.01
1992	4.42	7.72	11.60	16.55	23.47	1.93	5.36	14.65	15.46	15.60
1993	4.29	8.75	10.24	15.07	16.39	2.54	7.06	11.07	19.12	12.16
1994	3.41	4.17	9.18	18.41	17.88	2.38	5.79	13.67	19.51	16.52
1995	4.64	5.46	11.13	14.72	16.76	4.66	8.25	13.39	19.03	12.40
1996	4.35	7.76	12.19	15.00	30.22	5.80	5.29	12.07	17.18	14.35
2003	5.73	13.63	16.84	25.33	29.91	5.71	11.72	14.31	20.16	22.54
2004	5.05	16.02	21.91	27.41	33.92	6.19	13.96	18.33	23.43	23.99
2005	7.62	18.33	25.61	29.70	37.46	6.84	17.33	22.58	24.99	25.81
2006	12.80	19.81	22.27	26.80	35.65	10.71	17.78	18.25	22.82	24.57
2007	12.45	21.37	22.77	27.30	35.68	10.34	17.81	19.59	22.18	25.07

the increasing prevalence of IBD in Poland. As mentioned above, there have been no prospective population studies on the incidence of IBD in Poland. We believe that many of the reported hospitalizations may have been incident cases. Because of limited access to specialist care in Poland, many symptomatic (but not severely ill) patients are referred to hospitals for diagnostic purposes. This approach appears to be a faster and easier way to get proper care than obtaining a referral to a specialist outpatient clinic. Moreover, in the pediatric population, colonoscopy (which is essential for IBD diagnosis) is almost always performed under sedation, which is available only in the hospital setting. In the present study, there was a peak rise in hospitalizations for IBD in the age group of 17 to 29 years. This data is consistent with the age of the peak incidence of IBD. In a recent meta-analysis, most CD and UC studies exhibited the highest incidence in the second to fourth decade, with 78.0% of CD studies and 51.1% of UC studies reporting the highest incidence among 20- to 29-year-olds.⁴ Therefore, it seems justified to assume that the growing hospitalization rates in Poland correlate with rising prevalence and incidence of IBD.

The most recent hospitalization rate for UC in our study was 21.60 per 100,000 individuals. In other European countries, the hospitalization rate for UC varies greatly, ranging from 8.4 per 100,000 in Switzerland to 46.8 per 100,000 in Scotland.²² In North America, the rates are lower compared with those reported in our study and in most European countries (10.8 per 100,000 in the United States and 13.3 per 100,000 in Canada).^{9,11} Relatively high rates in Poland might have several explanations. Some primary differences among countries regarding the mode of utilization of health care resources may have contributed to these results. It is possible that admissions with less severe disease (i.e., a lower threshold for hospital admissions) occur more often in Poland. Alternatively, as mentioned above, because of limited access to outpatient specialist care, patients in Poland are more often admitted

to the hospital for a diagnostic purpose and not because of severe deterioration. Finally, the reason might be the recent rapid growth of UC incidence in Poland, which occurred a few decades later in Eastern Europe than in Western countries.

In the present study, hospitalization rates were a few times lower for CD than for UC. This finding is in contrast to the results from the majority of the European countries, Canada, and the United States, and most likely reflects a much lower prevalence of CD in Poland.^{7,8,11,22} However, during the study period, the hospitalization rates increased more rapidly for CD than for UC, suggesting that the prevalence of CD is currently growing faster, in agreement with the results of population studies from North America and Europe.^{23,24} It is believed that in a defined region, the rise in CD incidence occurs approximately a decade later than the rise in UC incidence, and now CD is outstripping UC regarding incidence and prevalence in countries such as Canada, France, and Belgium.^{4,24,25} A steeper increase in hospitalizations that we observed for CD compared with UC in the younger age groups may reflect current burst in the incidence of CD that has been observed elsewhere.

We observed that men were considerably more likely to be hospitalized for UC than women. As for CD, we observed a predominance of women in 3 of 11 analyzed years, and no sex differences in the remaining years. In a recent systematic review, the female-to-male incidence ratio varied from 0.51 to 1.58 for UC studies and 0.34 to 1.65 for CD studies, suggesting that the diagnosis of IBD was not sex-specific.⁴ However, in high-incidence areas, it might be that UC occurs more often in men and CD occurs more often in women.^{26,27} A recent study of hospitalization rates in 9 European countries reported that women were more often hospitalized for CD than men in 7 of those countries, while there was a slight male predominance regarding UC in 6 countries.²²

The highest CD hospitalization rate per 100,000 individuals was observed in the age group of 17 to 29 years followed by that of 30 to

39 years. This finding is consistent with published results.^{8,9,11,22} However, we did not observe a peak in the rate of hospital readmissions in the older population, although this peak has occurred in Western European countries and is partly related to the aging of the general population.²² It is possible that there are not enough older patients with CD in Poland to establish this rise, or that the late peak in CD incidence does not occur in Poland. Another reason for this difference might be that CD presenting in older age most often affects the colon, which might cause diagnostic difficulties and incorrect classification of the disorder as UC.

In contrast, the peak hospitalization rates for UC were observed in the elderly, in agreement with the results from other countries.²² One reason for this finding may be the second late peak of UC incidence. In addition, older patients with exacerbation of UC might be referred to hospitals more often than younger patients owing to concomitant diseases. It is also possible that some individuals with ischemic, iatrogenic, nonsteroidal anti-inflammatory drug-induced, or *Clostridium difficile*-induced colitis, which are conditions that primarily affect the elderly, were incorrectly coded as having UC.

One limitation of our analysis is the lack of data on readmissions. If readmission rates remained steady throughout the study period, one might more confidently assume that the observed increase in IBD hospitalization rates is related to a rising incidence and/or prevalence rather than to the administrative reorganization of health care. On the other hand, the rising readmission rate might suggest a more serious course of the disease in the population, but this has not been observed elsewhere.²⁸ Another reason for the rising hospitalization rates might be the contribution of one-day hospitalizations, such as those related to biological treatment. We had no data on one-day hospitalization rates, and we were unable to extract those rates from the total hospitalization rates. Notably, biologicals have not yet been registered for UC treatment in the period covered by our analysis. Regarding CD, because of the lack of clear reimbursement rules in Poland at the beginning of the millennium, infliximab was in common use only in tertiary centers. We believe that it is unlikely that readmissions for biological therapy have significantly affected the hospitalization rates.

In conclusion, using NIPH data, we calculated that hospitalization rates for IBD in Poland increased overall during the years from 1991 to 2007, with rising time trends observed in both sexes. The hospitalization rate for UC was significantly higher among men than among women. We believe that these data reflect the growing incidence of IBD in Poland; however, a population study is warranted to confirm this hypothesis. The awareness of the growing burden of IBD should be fostered both in society and

throughout the national health care system authorities in Poland.

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Zwiększenie częstości hospitalizacji z powodu nieswoistych chorób zapalnych jelit w Polsce

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SŁOWA KLUCZOWE

choroba
Leśniowskiego
i Crohna, częstość
hospitalizacji,
epidemiologia,
nieswoiste choroby
zapalne jelit,
wrzodziejące
zapalenie jelita
grubego

STRESZCZENIE

WPROWADZENIE Zapadalność na nieswoiste choroby zapalne jelit (NChZJ) i częstość ich występowania w Polsce nie są znane.

CELE Celem badania było określenie częstości hospitalizacji z powodu NChZJ oraz trendów czasowych w ostatnich dwóch dekadach.

PACJENCI I METODY Dane pochodzą z bazy Narodowego Instytutu Zdrowia Publicznego (1991–1996 i 2003–2007). Uzyskano dane na temat hospitalizacji z powodu choroby Leśniowskiego i Crohna (ChLC) oraz wrzodziejącego zapalenia jelita grubego (WZJG). Obliczono częstość hospitalizacji na 100 000 osób w zależności od wieku, płci i rodzaju choroby.

WYNIKI W latach 1991–1996 i 2003–2007 każdego roku częstość hospitalizacji z powodu NChZJ była większa niż w roku poprzednim i wzrosła od 12,50 do 30,61 na 100 000 osób. U obu płci stwierdzono trend rosnący. Częstość hospitalizacji z powodu ChLC zwiększyła się od 3,53 do 9,35 na 100 000, a z powodu WZJG od 8,97 do 21,26 na 100 000. Trend rosnący w częstości hospitalizacji z powodu ChLC stwierdzono u mężczyzn od 0 do 39. rż. U kobiet trend rosnący w ChLC obserwowano w latach 2003–2007. Częstość hospitalizacji z powodu WZJG była większa u mężczyzn (9,18 do 23,29 na 100 000) niż u kobiet (8,77 do 19,37 na 100 000). W przypadku WZJG trend rosnący obserwowano w latach 2003–2007 u mężczyzn i kobiet we wszystkich grupach wiekowych z wyjątkiem osób między 40. a 64. rż.

WNIOSKI Częstość hospitalizacji z powodu NChZJ w Polsce w latach 1991–1996 i 2003–2007 zwiększyła się, wykazując rosnący trend u obu płci. W ChLC u mężczyzn trend rosnący występował jedynie w młodszych grupach wiekowych. Częstość hospitalizacji z powodu WZJG była istotnie większa u mężczyzn niż u kobiet.

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