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Article

Prevalence, Incidence, Mortality and Trends in Treatment of Inflammatory Bowel Disease in Catalonia Between 2017 and 2023. An Epidemiological Update

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Abstract

Background: Prevalence of inflammatory bowel disease (IBD) is increasing worldwide, while incidence is tending to stabilize. Moreover, the use of biological treatments is increasing, some studies suggest that surgeries and hospitalizations are decreasing instead. **Methods:** A population-based, retrospective cohort study was conducted using data from the Catalan Health Surveillance System (CHSS). All patients diagnosed with IBD were included between 2017-2023. Crude incidence and prevalence rates were calculated for all the Catalan population. Data on pharmacological therapy, surgical procedures, hospitalizations, and mortality were analyzed. Trends in age-sex-adjusted rates were also estimated, and logistic regression was used to calculate the adjusted mortality odds ratio (OR). Data for Crohn's disease (CD) and ulcerative colitis (UC) were analyzed separately. **Results:** The number of prevalent IBD cases rose from 28,752 in 2017 to 41,423 in 2023. Despite incidence rates remained stable (30.8 in 2017 and 29.9 per 100,000 inhabitants in 2023) prevalence rates increased (386.9 and 510.9 per 100,000 inhabitants respectively). The use of biologics significantly increased (from 13.5% in 2017 to 21.0% in 2023), particularly ustekinumab and vedolizumab. In parallel, a decline in the use of immunosuppressants were observed. IBD-related surgeries and hospitalizations decreased during study period, particularly among CD patients. Mortality remained low but was higher among IBD patients compared to the general population. **Conclusion:** Incidence of IBD in Catalonia has stabilized, while its prevalence continues rising, suggesting a transition to Stage 3 (compounding prevalence). The use of biological treatments is increasing steadily, whereas rates of surgeries and hospitalizations are consistently decreasing.

Keywords: epidemiology; quality of life; socio-economical and psychological endpoints

Introduction

Inflammatory bowel disease (IBD) comprises two chronic intestinal disorders: Crohn's disease (CD) and ulcerative colitis (UC) [1]. IBD affects millions of people worldwide and presents a variable clinical course, characterized by alternating periods of remission and flares [2]. Current therapeutic approaches to IBD include the use of therapies such as biological treatments and JAK inhibitors [3,4]. Recent studies have called for the introduction of more aggressive treatment strategies during the early years of the disease; for example, the PROFILE and ACTIVE studies demonstrated higher response rates with combination therapy using infliximab and azathioprine [5,6]. Despite these advances, the reported annual hospitalization rate approaches 20%, and approximately 50% of IBD patients require surgery within 10 years of diagnosis [7–10].

From an epidemiological perspective, Kaplan *et al.* characterized four stages of IBD: **Stage 1 (emergence)** refers to developing regions with low incidence and prevalence; **Stage 2 (acceleration in incidence)** includes newly industrialized regions with rapidly rising incidence but low prevalence; **Stage 3 (compounding prevalence)** corresponds to early industrialized regions with steadily climbing prevalence due to the cumulative effect of a much higher incidence than mortality over time; and finally, **Stage 4 (prevalence equilibrium)** has been hypothesized theoretically as a period in which prevalence plateaus due to the shifting demographics of an aging IBD population, although the existence of this stage has not yet been conclusively demonstrated [11].

In 2011, the Catalan Health Service (CatSalut) set up the Catalan Health Surveillance System (CHSS) database, a population-based health database gathering health information derived from public universal healthcare covering of the entire population of Catalonia, which in 2023 exceeded eight million inhabitants. Previous studies conducted by our group using this database recorded a high prevalence and incidence of IBD, which both rose between 2011 and 2016, suggesting that Catalonia was in the acceleration in incidence stage (Stage 2) [12]. An increase in the use of biological treatments was also observed, which correlated with a decrease in the rates of surgeries and hospitalizations [13].

The aim of the present study is to provide an update on the current epidemiological status of IBD in Catalonia and to determine whether the region has transitioned to Stage 3 (compounding prevalence). Additionally, we aim to evaluate trends in the use of treatments and their correlation with surgery and hospitalization rates.

Material and Methods

Study Design, Participants, and Database

Retrospective analysis of an administrative database that includes all individuals diagnosed with IBD in Catalonia (north-west Europe) between 2017 and 2023 according to the International Classification of Diseases, 10th revision, Clinical Modification codes (ICD-10-CM codes). The ICD-10-CM codes used are shown in Supplementary Table S1. A case was considered valid only if an IBD treatment was also recorded.

The CHSS is a comprehensive healthcare information system designed to integrate activity registers from different sources pivoting on the patient, rather than the healthcare provider, thus allowing longitudinal follow-up of care. Since 2018, the CHSS has also included data from hospitals' outpatient clinics, enhancing both the quantity and quality of its information. The system registers diagnostic information based on a Minimum Basic Data Set aligned with the ICD-CM classification and including data on pharmacy prescriptions, outpatient visits, ambulatory rehabilitation, hospital admissions, and other patient services. It offers a holistic, cross-sectional view of health problems by consolidating data from the entire public health system. Currently, the CHSS serves as a robust, population-based healthcare data source, covering information from the more than eight million residents of Catalonia.

The CHSS includes all diagnoses reported by providers, whether primary or secondary, and employs an automated validation system to ensure data consistency and to detect potential errors. Regular external audits further support its reliability [14].

Data on exposures to different IBD treatments were retrieved from the electronic dispensation records for the same period. IBD treatments included biological drugs and Janus Kinase inhibitors (iJAKs) (infliximab, adalimumab, golimumab, vedolizumab, ustekinumab, tofacitinib, upadacitinib and filgotinib), immunosuppressive agents (azathioprine, 6-mercaptopurine and methotrexate), corticosteroids and salicylates. The list of active principles studied is appended as Supplementary Table S2. A patient was considered to have received a particular treatment during a specific year if at least one prescription of the biologic was dispensed during this period.

Data on the number of surgical procedures and the hospitalization rate of IBD patients were also obtained from the CHSS, and both were expressed per 1000 patients/year. ICD-10-CM codes for the different surgical procedures and hospitalizations are detailed in Supplementary Tables S3 and S4.

Statistical Analysis

New cases of IBD were defined as patients residing in Catalonia who were diagnosed with IBD for the first time in each year of the study period (2017- 2023). Prevalent cases were defined as the total number of patients with IBD, residing in Catalonia and alive on December 31 of each year of the study period, and also in relation to the total Catalan population provided by the Institut d'Estadística de Catalunya (IDESCAT) [15], which was used as the reference population for the calculation of incidence and prevalence rates. Data were adjusted by age and sex and expressed per 100,000 inhabitants using Poisson regression models.

The crude mortality rates are expressed per 100 patients and are calculated both by age groups and overall. Causes of death are not explicitly recorded in the database and so could not be determined in this study. Finally, for the year 2023, the probability of dying in the three populations (CD, UC and no-IBD) adjusted by age, sex and level of income was calculated by logistic regression. Age was introduced as a categorical variable (15-44, 45-64, 65-74, 75-84 and >84 years) and excluded patients aged below 15 years old. Individual-level income data were obtained from pharmaceutical co-payment groups of the Spanish Social Security System, that are yearly revised and classify insured users based on annual income, categorized as <18,000, 18,000–100,000, and >100,000 euros per year, and also on a number of conditions that qualify for welfare support from the Catalan government. Based on this information, we defined four individual-level socioeconomic status (SES) categories: 'high SES' (income >100,000 euros/year), 'medium SES' (18,000–100,000 euros/year), 'low SES' (<18,000 euros/year), and 'very low SES' (individuals receiving government welfare support).

To calculate the annual rate per patient/year for use of IBD treatments, surgical procedures, and hospitalizations, we estimated the time at risk for each patient in each of the periods. Exposure periods initiated on January 1 (or at the date of diagnosis for incident patients) and ended on December 31 of each year (or with the death of the patient). The sum of the number of users for each treatment or surgical procedures or hospitalizations in the period was used as a numerator and the denominator was the amount of patients/year at risk; data were expressed in persons per year. The statistical significance of the global variation of rates during this time period was calculated using generalized linear models (Poisson regressions). Pearson correlation coefficients were calculated between the rates of surgical procedures or hospitalizations and the rates of users for each group of drugs. A *p* value of 0.05 or lower was considered as significant. The statistical analysis was carried out using the statistical package R, version 4.4.0.

The study was performed and reported according to the STROBE Statement guidelines (<http://www.strobe-statement.org/index.php?id=strobe-home>) [16].

Results

Patients' Characteristics

Male/female and age distributions of patients are shown in Figure 1 (see detailed data for CD and UC in Supplementary Figure S1). Mean age (in 2023) was 50 years for CD and 56.3 years for UC; mean ages increased slightly during the study period (See Supplementary Figure S2).

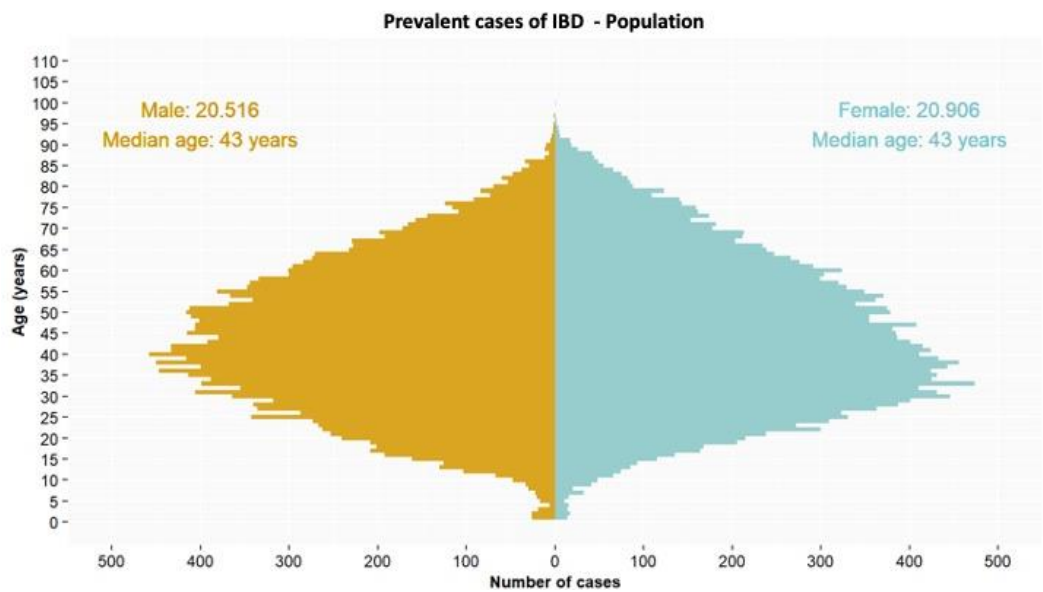


Figure 1. Sex and age distribution for IBD patients in Catalonia in 2023.

Prevalence and Incidence

The number of prevalent IBD cases rose from 28,752 in 2017 to 41,442 in 2023. Of these, approximately two thirds were UC and the remainder CD. Overall UC-adjusted prevalence in Catalonia was 236.4 per 100,000 inhabitants in 2017 (95%CI 232.9-239.9), increasing to 316.6 in 2023 (95%CI 312.8-320.5). The corresponding figures for CD were 150.5 (95%CI 147.7-153.3) in 2017 and 194.4 (95%CI 191.4-197.4) in 2023 (see detailed data in Table 1). The total number of IBD patients increased notably over the 2017-2023 period. Specifically, there were 8,195 more UC patients, a rise of 46.7% in these years. and 4,475 more cases of CD, a rise of 25.5%.

Table 1. Incidence, prevalence and mortality for UC, CD and IBD between 2017 and 2023. Incidence and prevalence are expressed per 100,000 inhabitants and mortality per 100 inhabitants.

		2017			2018			2019			2020			2021			2022			2023		
		n	rate	IC95 %	n	rate	IC95 %	n	rate	IC95 %	n	rate	IC95 %	n	rate	IC95 %	n	rate	IC95 %	n	rate	IC95 %
UC	Incidence	1,373	18.1	17.5-19.4	2,597	34.6	33.3-35.9	1,906	25.1	24.0-26.2	1,547	20.1	19.1-21.1	1,735	22.4	21.4-23.5	1,637	21.0	20.0-22.0	1,589	19.6	18.7-20.6
	Prevalence	17,533	236.4	232.9-239.9	19,746	263.3	260.0-266.7	21,261	280.2	276.4-284.0	22,300	289.1	285.5-293.1	23,534	303.3	299.6-307.3	24,644	315.4	311.5-319.4	25,728	316.6	312.8-320.5
	Mortality	272	1.5		307	1.5		325	1.5		449	2		423	1.8		453	1.8		419	1.6	
CD	Incidence	925	12.4	11.6-13.2	1,421	18.9	17.9-19.9	1,076	14.1	13.3-15.0	824	10.7	10.0-11.4	848	11.0	10.2-11.7	839	10.8	10.1-11.6	825	10.3	9.6-11.0
	Prevalence	11,219	150.5	147.7-153.3	12,426	165.3	162.4-168.2	13,304	175.0	172.0-178.0	13,880	179.0	177.0-182.9	14,527	187.5	184.5-190.6	15,133	194.3	191.3-197.5	15,694	194.4	191.4-197.4
	Mortality	112	1.0		160	1.3		148	1.1		194	1.4		153	1		195	1.3		194	1.2	
IBD	Incidence	2,298	30.8	29.6-32.1	4,018	53.5	51.8-55.1	2,982	39.2	37.8-40.7	2,371	30.7	29.5-32.0	2,583	33.3	32.1-34.7	2,476	31.8	30.6-33.1	2,414	29.9	28.7-31.1
	Prevalence	28,752	386.2	382.5-391.4	32,172	428.2	424.3-433.7	34,565	455.0	450.4-460.0	36,184	469.0	464.4-474.1	38,054	491.0	486.0-495.9	39,777	509.0	504.8-514.8	41,442	510.0	506.0-515.9
	Mortality	384	1.3		467	1.4		473	1.3		643	1.7		576	1.5		648	1.6		613	1.5	
Population of Catalonia		7,496,276			7,543,825			7,619,494			7,722,203			7,739,758			7,758,615			8,016,606		

Over this period, 19,142 additional incident IBD cases were recorded. The adjusted rates of incidence remained stable over the study period, with an abnormal peak in 2018-2019. UC-adjusted incidence increased slightly from 18.1 per 100,000 inhabitants in 2017 (95%CI 17.5-19.4) to 19.6 in 2023 (95%CI 18.7-20.6). As for CD, the incidence decreased from 12.4 (95%CI 11.6-13.2) in 2017 to 10.3 (95%CI 9.6-11) in 2023 (see detailed data in Table 1 and Figure 2).

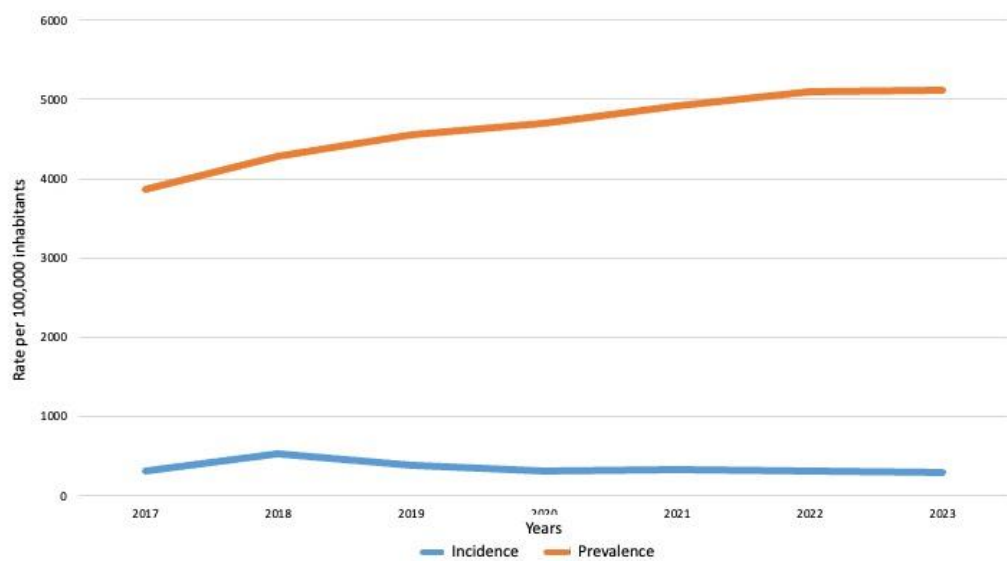


Figure 2. Incidence and prevalence of IBD in Catalonia between 2017 and 2023.

Mortality

Mortality rates presented small variations over the course of the study period; the mean mortality rate was 1.5 per 100 inhabitants, and the maximum rate was 1.7 per 100 (Table 1). Figure 3a shows the 2023 mortality rates broken down by age. The mortality rate was very low until the fifth decade of life, and then increased gradually. When comparing with non-IBD population, an excess mortality of IBD patients was observed. The age- and sex-adjusted odds ratios (OR) of death of IBD patients in 2023 were significantly higher both for patients with CD (OR: 1.580; 95%CI: 1.362 - 1.833) and for patients with UC (OR: 1.213; 95%CI: 1.097 - 1.342) (Figure 3b).

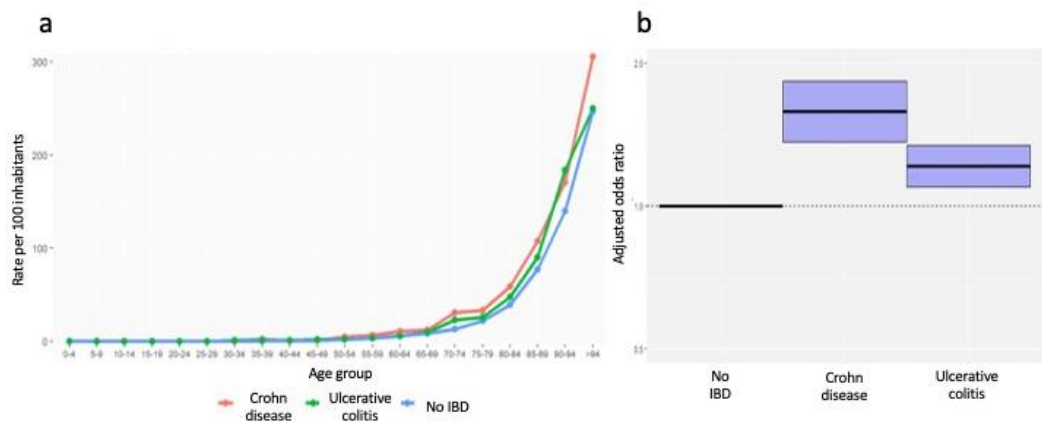


Figure 3. Mortality rates of IBD patients by age (a), and age- and sex- adjusted odds ratios of death due to IBD in Catalonia in 2023 (b).

Time Trends in the Use of Drugs

Salicylates were used in half of the UC patients (50.8% in 2023), but in CD, the number of users was much lower, falling over the study period from 16.1% in 2017 to 13.2% in 2023 ($p<0.001$ for both CD and UC).

The number of users of immunosuppressive treatment also fell in both UC and CD patients, from 12.3% and 36.8% in 2017 to 11% and 28% respectively in 2023. The difference was statistically significant for CD ($p<0.001$) but not for UC ($p=0.146$).

The use of biological treatments increased from 13.5% in 2017 to 21% users in 2023 ($p < 0.001$ for both CD and UC) (Supplementary Figure S3 and Supplementary Tables S5–S7).

With regard to the use of biological therapies and iJAKs (Supplementary Figure S4 and Supplementary Tables S8–S10), infliximab was the most commonly administered in 2017, being applied to 1,807 patients (6.3% of all IBD cases and 43.6% of all patients receiving biologics). This number increased to 2,865 in 2023, although the percentage of IBD users remained relatively stable (6.9% of all IBD patients) they percentage of those receiving biologics decreased (30.8%). Adalimumab use rose significantly, from 1,795 patients in 2017 (6.2% of all IBD patients and 43.2% of patients receiving biologics) to 3,281 in 2023 (7.9% of all IBD patients and 34.8% of patients receiving biologics), making it the most widely used treatment in 2023. The use of golimumab was limited, peaking at 176 patients in 2019 (0.5% of all IBD patients and 3% of patients receiving biologics).

The administration of ustekinumab increased markedly, from 133 patients in 2017 (0.5% of all IBD patients and 3.2% of patients receiving biologics) to 2,001 in 2023 (4.8% of all IBD patients and 20% of patients receiving biologics), establishing it the second most used treatment after anti-TNF agents. Vedolizumab use also rose, from 275 patients (1% of all IBD patients and 6.6% of patients receiving biologics) in 2017 to 831 (2% of all IBD patients and 9% of patients receiving biologics) in 2023.

Among JAK inhibitors, tofacitinib was the most commonly used, rising from just two patients in 2017 (0.01% of all IBD patients and 0.4% of patients receiving biologics) to 185 in 2023 (0.4% of all IBD patients and 1.9% of patients receiving biologics). Upadacitinib and filgotinib were used in only a few cases, both off-label during the study period.

The trend in the use of all biologics was similar in CD and UC, except for golimumab, predominantly used in UC, and adalimumab, primarily used in CD.

Surgical Procedures

The absolute number of ostomies and resections rose slightly from 2017 to 2023: ostomies from 204 to 233, and resections from 288 to 360 (Supplementary Tables S11–S13). However, as the prevalence of IBD in this period of time increased markedly, the rate per 1000 patients/year decreased significantly in both cases: ostomies from 7.4 to 5.8 ($p = 0.015$), and resections from 10.4 to 9.0 ($p = 0.026$) (Supplementary Figure S5).

Patients with CD underwent surgery almost twice as often as those with UC, in 2023, ostomy rates in these two conditions were 7.6% and 4.7% respectively, and resection rates reached 11.2% and 7.6%.

Overall, for IBD, a significant positive correlation was observed between the use of immunosuppressants and the need for ostomies ($r = 0.83$; $p < 0.05$). On the other hand, biological treatment was negatively correlated with the need for ostomies ($r = -0.79$; $p < 0.05$). Specifically, for CD, the use of salicylates and immunosuppressants demonstrated a significant positive correlation with both surgical procedures, ostomies ($r = 0.83$; $p < 0.05$ and $r = 0.78$; $p < 0.05$ respectively) and resections ($r = 0.78$; $p < 0.05$ and $r = 0.77$; $p < 0.05$ respectively). No other significant correlations were found (Supplementary Figure S6).

Hospital Admissions

The number of IBD patients requiring hospitalization for any cause rose from 7,147 in 2017 to 10,121 in 2023; the rates per 1,000 inhabitants remained stable (258.8 and 252.5 respectively).

Regarding the specific causes of hospitalization, IBD-related hospitalization fell from 34.4 per 1,000 patients in 2017 to 27.3 per 1,000 patients in 2023 ($p < 0.001$). Patients with CD were more than twice as likely to be hospitalized as those with UC. Similarly, infection-related hospitalizations also fell from 10.2 to 8.9 per 1,000 patients ($p = 0.06$). Detailed data on other causes of hospitalization are provided in Supplementary Tables S14–S16 and Supplementary Figure S7.

Overall, for IBD, a positive correlation was found between the use of corticosteroids and the need for hospitalization for any cause (0.77). The use of immunosuppressants also showed a positive

correlation with the need for hospitalization due to IBD (0.87). On the other hand, biological treatment presented a negative correlation with the need for hospitalization due to IBD (-0.86). Specifically, for CD, biological treatment negatively correlated with the need for hospitalization due to IBD (-0.87), while for UC, the use of corticosteroids was positively correlated with hospitalizations due to any cause (0.91). No other significant correlations were found (Supplementary Figure S6).

Discussion

This study presents an update on the epidemiology of IBD in Catalonia.

During the 2011 and 2016 increases were in both the prevalence and incidence of IBD observed, suggesting that Catalonia was in IBD Stage 2 (acceleration of incidence) [12]. In the present study, incidence rates were shown to have stabilized, while prevalence continued its upward trend, suggesting a transition to Stage 3 (compounding prevalence).

These trends are in line with observations from other regions currently transitioning to Stage 3. In Olmsted County, Minnesota, USA, the prevalence of CD and UC increased from 174 and 214 cases per 100,000 persons in 2001 to 246.7 and 286.3 cases per 100,000 persons respectively in 2011. The incidence increased steadily between 1970 and 2010; however, in recent years, it has shown a tendency to stabilize and plateau [19]. Similarly, in Denmark, the prevalence of IBD increased significantly from 58 cases per 100,000 person-years in 1980 to 893 per 100,000 person-years in 2017. During the same period, however, the incidence of CD and UC rose from 5.1 and 6.2 to 15.6 and 27.2 per 100,000 person-years respectively [18]

Other countries seem to have already transitioned to Stage 3. In Scotland, the prevalence of IBD increased from 567 per 100,000 inhabitants in 2008 to 784 per 100,000 inhabitants in 2017. Meanwhile, the incidence of IBD stabilized between 2012 and 2017, fluctuating between 42.9 and 40.8 per 100,000 inhabitants [20]. In Veszprem, Hungary, the prevalence of CD and UC in 2011 was 191.18 and 283.51 per 100,000 inhabitants, rising to 236.78 and 317.79 per 100,000 inhabitants respectively by the end of 2015. The incidence rates of CD and UC during this 12-year period initially increased, but later plateaued and decreased slightly, with mean incidence rates of 9.9 and 11 per 100,000 person-years respectively [21,22]. In Israel, there was a significant increase in the prevalence of CD and UC, from 10,383 and 10,737 patients in 2005 to 24,934 and 20,875 respectively in 2017. However, the overall incidence of IBD fell slightly, from 31.3 per 100,000 inhabitants in 2005 to 25.4 per 100,000 inhabitants in 2017 [23].

We have observed a notable shift in the age distribution of patients with IBD. In 2023 the proportional representation of the population in older age groups (above 60 years) was higher than during the 2011-2016 period [12]. The reason may have been that, although IBD is typically diagnosed earlier in the lifespan, therapeutic advances, improvements in the control of this disease and the low related mortality contributed to the aging of the IBD population [24]. This progressive aging in the IBD population has been observed in some studies [25–27] and is forecast in others [20].

As far as treatments are concerned, the use of biological treatments presented a huge increase, while the use of classical immunosuppressants fell notably. This could be explained by the increasing availability of biological therapies and new drugs used, usually, in monotherapy and the aging of IBD population just mentioned, which may have contraindications and increased risk for adverse events with non-biologic immunosuppressant treatment.

As previously reported [13], this study also demonstrated that the increase in the use of biological treatments may lead to a reduction in surgery and hospitalization rates, especially in the IBD-related hospitalizations. We stress that this reduction is achieved without an increase in the hospitalizations for infections or neoplasms. The fact that our group observed similar findings over time reinforces the internal consistency of our study, suggesting that the results are not isolated or incidental [12]. Several studies also support these findings. In a national study in Israel, Atia *et al.* observed that the increase in the use of biological treatments from 8.9% in 2005 to 36% in 2019 was accompanied by falls in the hospitalization and surgery rates. Additionally, the median time to hospitalization and surgery also decreased, from 1.3 and 4.7 years in 2005 to 0.2 and 0.6 years in 2019,

respectively [28]. Khoudari *et al.* reported data from a commercial database within the US healthcare system, finding that IBD patients treated with biologics were significantly less likely to undergo bowel resection (9.2%) than those who had never received these agents (12.1%) [29]. However, some studies do not fully align with these results. In a study conducted in Ontario between 1995 and 2012, Murthy *et al.* reported that the use of anti-TNF treatment did not reduce CD-related hospitalizations (OR 1.06, 95%CI: 0.81–1.39) or intestinal resections (OR 1.10, 95%CI: 0.81–1.50). Similarly, no reductions were observed in UC-related hospitalizations (OR 1.22, 95%CI: 1.07–1.39) or colectomies (OR 0.93, 95%CI: 0.54–1.61) [30]. Other studies are in partial agreement. Fansiwala *et al.* reported that, although the overall rate of surgeries fell with the increased use of biological treatments, surgeries for bowel obstruction rose slightly. They theorized that the effect of medical therapy may have a limited impact, particularly in cases of stricturing disease [31].

This study has certain limitations. First, the comparison with the previous study must be interpreted cautiously. During the ensuing period, a new version of the ICD-CM codes was introduced (version 10 in place of version 9), and the CHSS was updated, significantly improving the identification of IBD cases by applying stricter criteria and excluding doubtful cases. As a result, while it is possible to compare dynamics in prevalence, incidence, and rates, direct comparisons of absolute numbers or exact rates per inhabitant are not appropriate.

Second, the CHSS database includes only patients who use the public health system. Although it does not capture data from private healthcare due to differing patient identification codes, the impact of this shortcoming is expected to be minimal, because of the wide use of universal public coverage by the population, as the high costs of treating chronic conditions like IBD typically require patients to access publicly-funded care. Consequently some patients with mild disease might not have been recorded.

Furthermore, as IBD is a chronic disease and pharmacological treatments are relatively costly, few private insurance policies cover expensive biologic treatments and most patients who require these drugs are controlled in the public system, which funds 100% of the biological treatment cost. Thus, the dispensing of biologic can be assumed to be almost 100% public. Additionally, another potential limitation of this study is that immigrant patients who arrive in Catalonia with a prior IBD treatment are considered incident cases when they first come into contact with the public healthcare system; this may result in a slight overestimation of the true incidence. As a final limitation, as in every epidemiological study; causality cannot be proved for the correlations and trends observed.

As stated above, the prevalence of IBD in Catalonia has been rising since 2011. Although incidence seems to have been stabilized, the prevalence of IBD will continue to rise for many years. This highlights the urgent need to prepare our healthcare system to manage this growing patient population.

Additionally, as the IBD population ages, the presence of comorbidities will increase, making patient management more complex and requiring the application of a more holistic approach. It is thus essential to ensure appropriate medical, nursing and pharmacy resources, as many of these patients will require expert management and complex therapies and support. Significant adaptations in the current healthcare system will be essential to manage the increasing prevalence of IBD and the aging population in order to ensure sustainable and resilient long-term care.

In conclusion, our study demonstrates that the incidence of IBD in Catalonia has stabilized, while its prevalence continues to rise, suggesting a transition to Stage 3 (compounding prevalence). The study also shows that IBD patients have a small increase in mortality compared to the non-IBD population. The use of biological treatments is increasing steadily, whereas rates of surgeries and hospitalizations are consistently decreasing.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/doi/s1>, Supplementary Figure S1: Sex and age distribution for CD (a) and UC (b) patients in Catalonia in 2023, Supplementary Figure S2. Trends and evolution of mean ages of prevalent IBD cases in Catalonia between 2017 and 2023. Data for CD and UC. Supplementary Figure S3. Trends of use of IBD

treatments in Catalonia between 2017 and 2023, Supplementary Figure S4. Trends of use of biological and iJAKs therapies for IBD in Catalonia between 2017 and 2023, Supplementary Figure S5. Surgical trends for IBD patients in Catalonia between 2017 and 2023, Supplementary Figure S6. Correlations between treatments for IBD (a), CD (b) and UC (c) and outcomes (surgeries and hospitalization). Only significant correlations are shown, Supplementary Figure S7. Trends in hospitalization for IBD patients in Catalonia between 2017 and 2023, Table 1. Incidence, prevalence and mortality for UC, CD and IBD between 2017 and 2023. Incidence and prevalence are expressed per 100,000 inhabitants and mortality per 100 inhabitants. Supplementary Table S1. ICD-10 diagnoses for CD and UC. Supplementary Table S2. List of drugs used in IBD and ATC codes. Supplementary Table S3. ICD-10 codes for surgical procedures in IBD. Supplementary Table S4. ICD-10 codes for hospitalizations. Supplementary Table S5. Use of drugs in IBD from 2017 to 2023. Absolute number and percentage of IBD patients treated. Supplementary Table S6. Use of drugs in CD from 2017 to 2023. Absolute number and percentage of CD patients treated. Supplementary Table S7. Use of drugs in UC from 2017 to 2023. Absolute number and percentage of UC patients treated. Supplementary Table S8. Biologic treatment in IBD patients. Percentages are calculated by dividing the number of patients receiving the drug by the total number of patients with IBD. Supplementary Table S9. Biologic treatment in CD patients. Percentages are calculated by dividing the number of patients receiving the drug by the total number of patients with CD. Supplementary Table S10. Biologic treatment in UC patients. Percentages are calculated by dividing the number of patients receiving the drug by the total number of patients with UC. Supplementary Table S11. Surgical and diagnostic procedures in IBD from 2017 to 2023. Absolute number and rate per 1000 patients/year. Supplementary Table S12. Surgical and diagnostic procedures in CD from 2017 to 2023. Absolute number and rate per 1000 patients/year. Supplementary Table S13. Surgical and diagnostic procedures in UC from 2017 to 2023. Absolute number and rate per 1000 patients/year. Supplementary Table S14. Hospitalization in IBD patients. Absolute number and rate per 1000 patients/year. Supplementary Table S15. Hospitalization in CD patients. Absolute number and rate per 1000 patients/year. Supplementary Table S16. Hospitalization in UC patients. Absolute number and rate per 1000 patients/year.

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Ethical Issues: The research used retrospective anonymized data from the CHSS with no personal no identification retrievable or traceable back to the original source. This study was conducted in accordance with the Ethical Principles for Medical Research Involving Human Subjects of the Helsinki Declaration [17] and the local Personal Data Protection Law (LOPD 03/2018). The study was reviewed and approved by the local ethics committee of the Hospital Universitari Parc Taulí in Sabadell (CEIC 2025/5014). Given the retrospective nature of the study and the absence of personal identifiable information in the database, and the epidemiological objective of the study, the ethics committee waived the need for informed consent.

Sample data availability statements: For ethical/privacy reasons the data cannot be shared publicly because they come from a population registry supervised by the Catalan Health Surveillance System and can only be accessed from CatSalut. The data will be shared on reasonable request made to the corresponding author.

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