

Introduction

Inflammatory bowel diseases (IBD), including Crohn's disease (CD) and ulcerative colitis (UC), are chronic, debilitating inflammatory disorders of the gastrointestinal tract.

While IBD is associated with significant morbidity, data is limited regarding how mortality in IBD compares to the general population.

IBD affects over 1 million individuals in the United States, and the prevalence of these diseases continues to increase, leading to significant health care burden.¹

With the continuously increasing rates of IBD in the population, understanding leading causes of mortality is essential for improving clinical management and patient outcomes.

Aim

The aim of this study was to compare the mean age of death and determine how causes of inpatient mortality in patients with CD and UC compare to the general (non-IBD) population.

Methods and Materials

- A retrospective study using 2010-2018 data from the National Readmissions Database (NRD) was performed.
- The NRD provides a nationally representative sampling of patient-linked hospitalizations in the United States.
- We identified CD and UC patients and found the most common causes for mortality using ICD-9 and ICD-10 codes in the top 10 diagnosis positions.
- We compared the mean age of death in the UC and CD groups compared to the non-IBD group.
- Chi-squared tests with Rao-Scott modification were used to compare the frequencies of specific causes of mortality.

	Non-IBD	CD	UC
Total # of patients	240,540,246	1,118,705	696,392
Mean age (years)	66.9	64.5	67.3
Mean age of death (years)	70.4	68.1	71.6
Female sex (%)	58.6	57.9	54.7
Charlson Category (%)			
0	57.9	60.3	55.7
1-2	28.3	29.9	31.6
≥ 3	13.9	9.8	12.7
Payer (%)			
Medicare	34.8	35.3	39.6
Medicaid	23.0	13.6	10.7
Private insurance	33.7	42.5	42.0
Self-pay	4.3	4.5	3.6
No charge	0.45	0.58	0.53
Other	3.6	3.4	3.4
Zip Code Income Quartile (%)			
\$1-\$45,999			
\$46,000-\$58,999	28.8	24.1	21.4
\$59,000-\$78,999	25.7	25.4	24.1
\$79,000 and above	24.1	25.5	26.1
	20.0	23.6	27.0
Hospital size (%)			
Small	14.2	14.2	14.3
Medium	25.9	25.1	24.9
Large	59.9	60.7	60.8
Hospital Location/Type (%)			
Metro Non-Teaching	30.8	28.7	28.5
Metro Teaching	58.9	62.9	64.2
Non-Metropolitan	10.3	8.4	7.3

Table 1. Patient demographics and hospital characteristics.

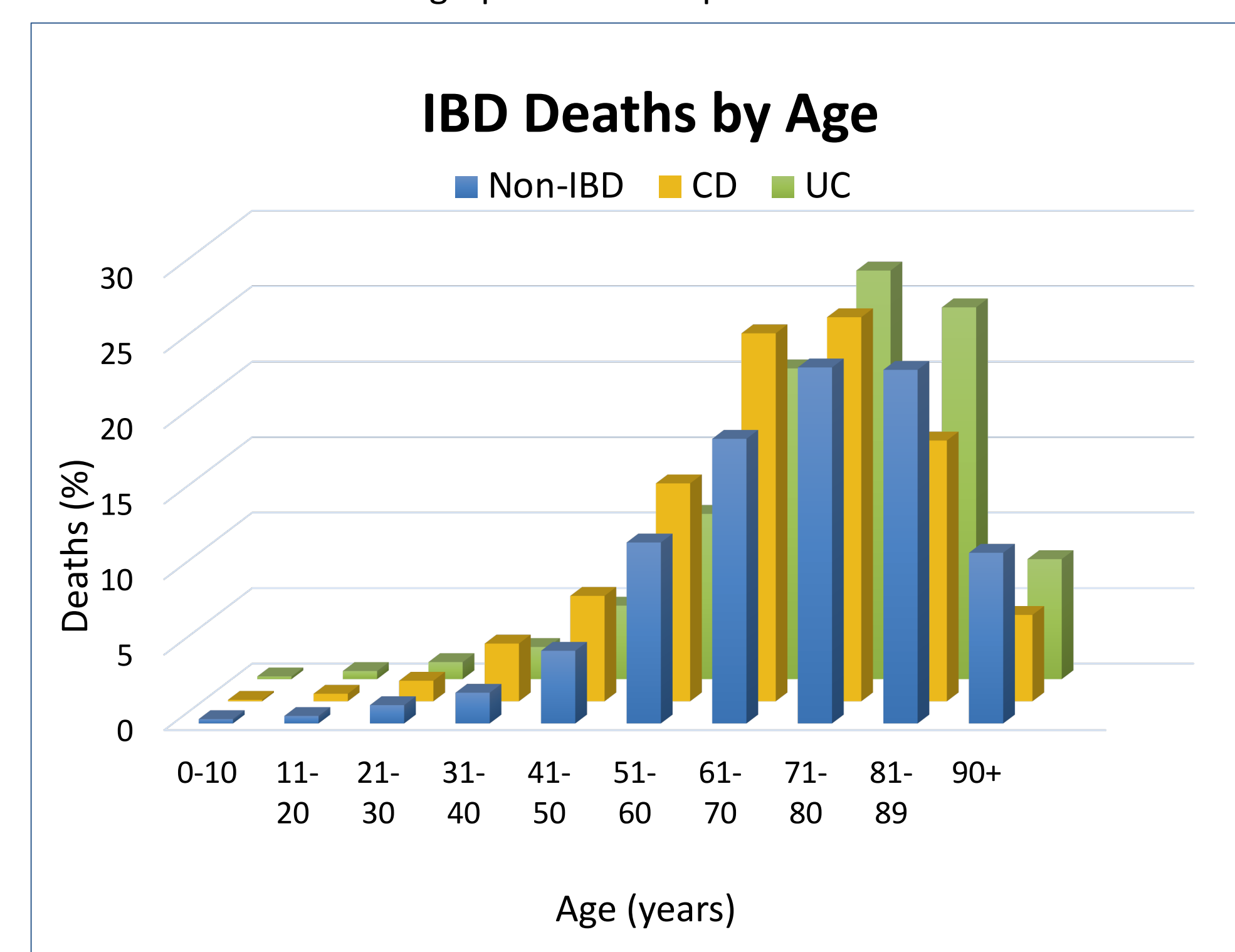


Figure 1. Histogram comparing the number of non-IBD, CD and UC deaths among different age groups.

Inpatient Mortality Rate by Cause

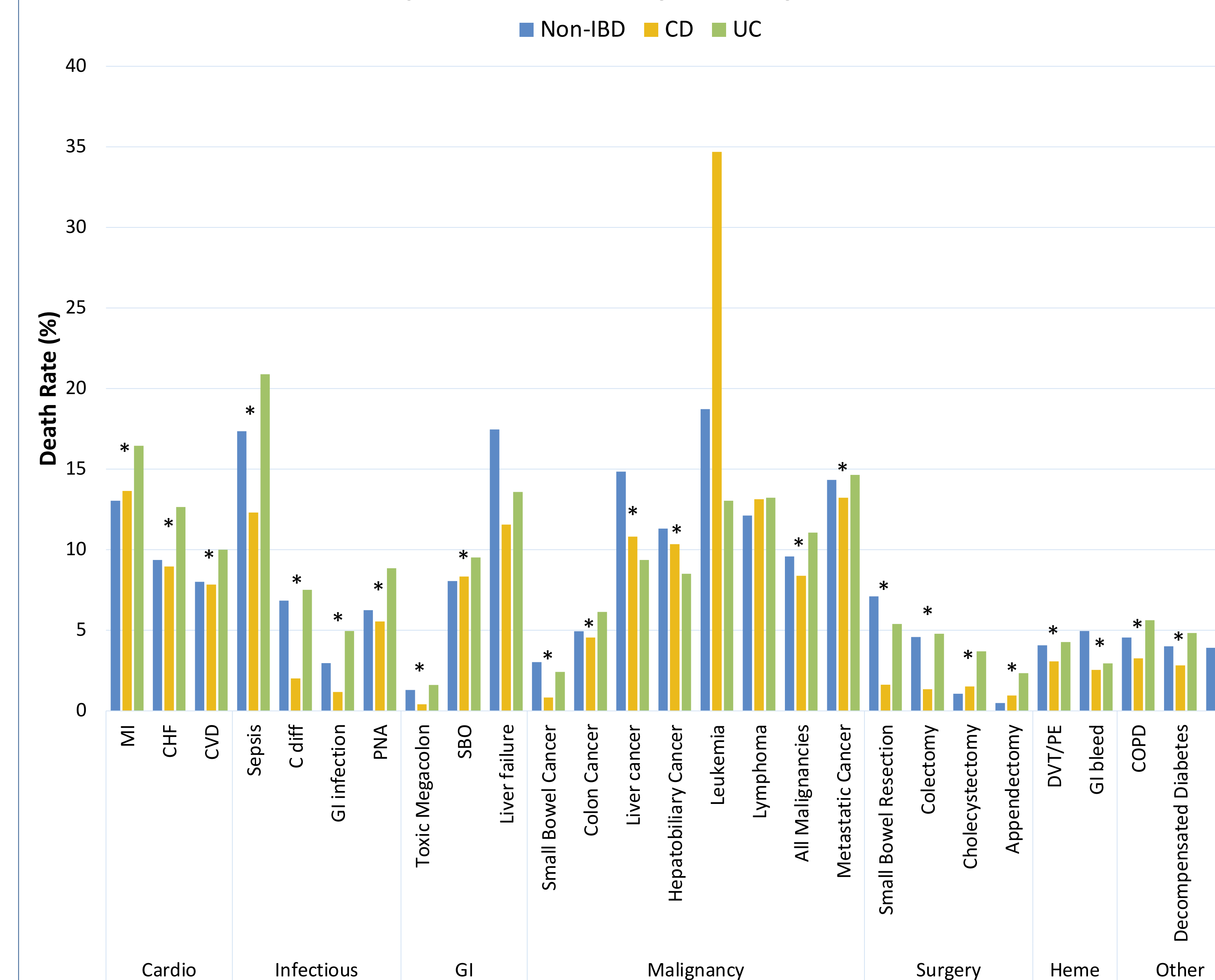


Figure 2. Death rates comparing non-IBD, CD and UC groups with specific inpatient diagnoses. * p < 0.05

Top Five Causes of Death

Non-IBD	Crohn's Disease	Ulcerative Colitis
Fluid electrolyte and acid base disorders (5.13%)	Fluid electrolyte and acid base disorders (5.54%)	Sepsis (6.37%)
Accident (4.64%)	Sepsis (5.31%)	Fluid electrolyte and acid base disorders (5.95%)
Respiratory failure (4.33%)	Respiratory failure (4.25%)	Respiratory failure (4.03%)
Sepsis (4.17%)	Accident (3.48%)	Acute renal failure (3.57%)
Acute renal failure (2.98%)	Acute renal failure (3.12%)	Accident (3.55%)

Table 2. Top causes of inpatient mortality among non-IBD, CD and UC groups.

Results

- Mean age of death (years) in the non-IBD group was 70.4 compared to 71.6 in the UC group and 68.1 in the CD group ($p < 0.01$).
- The majority of patients were admitted to large, metropolitan teaching hospitals. A higher percentage of the CD and UC groups had private insurance compared to the non-IBD group.
- Fluid electrolyte and acid base disorders was the top cause of death among the CD and non-IBD groups, compared to sepsis in the UC group. Other top causes of death among the groups included accidents, respiratory failure and acute renal failure.
- UC patients who had inpatient diagnoses of MI, CHF, and CVD had significantly higher mortality rates compared to non-IBD and CD patients.
- Death rates among those diagnosed with toxic megacolon and colectomy were similar among the non-IBD and UC groups, while the CD group had lower death rates from these diagnoses.
- Death rates for inpatient diagnoses of leukemia, lymphoma, liver failure and accidents were not significantly different among the groups.

Conclusions

The mean age of death significantly varied among the non-IBD, CD and UC groups. The non-IBD group and UC groups had greater mean ages of death compared to the CD group, with the greatest difference being 3.5 years between the UC and CD groups.

Fluid electrolyte and acid base disorders was the leading identified cause of mortality among the non-IBD and CD groups, compared to sepsis in the UC group. A significant number of UC and CD patients die of similar causes compared to non-IBD patients.

These data should guide our efforts in practice improvements for managing co-morbid conditions in our IBD patients and the prevention and management of sepsis.

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