Assessing the Cost of Work Productivity Loss in a Privately Insured **US Population With** Inflammatory Bowel Diseases

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OBJECTIVES

To estimate work productivity loss (WPL) associated with inflammatory bowel diseases (IBD) and compare IBD-related WPL estimated by different approaches

CONCLUSIONS

IBD had a significant, negative impact on patients' work productivity due to time spent on medical visits, which can be costly to both the employee and employer

Absenteeism and disability claims may underestimate the WPL and the associated costs that resulted from all types of IBD

Precautions should be taken when interpreting results from supplemental resources such as the Health Productivity and Management database

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References

- 1. Manceur, AM, et al. J. Med Economics. 2020;23(10):1092–101.
- 2. Ding, Z, et al. Crohn's & Colitis 360. 2022;6:1–12.

INTRODUCTION

- Patients with inflammatory bowel diseases (IBD) have demonstrated reduced work productivity compared to their non-IBD counterparts^{1,2}
- This loss of work productivity can result in higher indirect costs being associated with IBD,^{1,2} which can affect both the employee and employer
- It can be difficult to accurately estimate the indirect costs associated with IBD; therefore, this topic needs further investigation

METHODS

Patient Selection

- This real-world, observational study used diagnosis codes to select patients with IBD and control patients from the Merative™ MarketScan Research Commercial Claims and Encounters database, with a subset linked to the Health Productivity and Management (HPM) database which contains absenteeism and disability records collected by employers
- Newly diagnosed patients with IBD [Crohn's disease (CD) or ulcerative colitis (UC)] were ≥18 years old and had ≥2 IBD diagnoses (not associated with diagnostic laboratory or radiology services) on separate encounter dates \geq 30 days apart within a 2-year period from Jan 2000–Dec 2021 (Figure 1)
- Control patients did not have any claims associated with IBD diagnoses (including diagnostic laboratory or radiology services)

RESULTS

HPM. Health Productivity and Management: IBD. inflammatory bowel disease

 After matching, 3305 IBD-patient-control pairs were studied, including 464 pairs with HPM data (Figure 3) After matching, baseline characteristics were balanced between control patients and patients with IBD (Table 1)

Figure 3. Selection and Matching of Patient Populations With and Without HPM Data



Table 1. Baseline Characteristics of Matched Patient-Control Pairs, Stratified by Availability of HPM Data

	Control patients		Patients with IBD	
	All patients	HPM subset	All patients	HPM subset
	(n = 3305)	(n = 464)	(n = 3305)	(n = 464)
Age on index date, n (%)				
Mean (SD)	40.9 (13.8)	41.7 (11.3)	40.9 (12.7)	41.5 (11.4)
18–34	1181 (35.7)	153 (33.0)	1177 (35.6)	153 (33.0)
35–44	690 (20.9)	111 (23.9)	792 (24.0)	111 (23.9)
45–54	726 (22.0)	119 (25.7)	706 (21.4)	121 (26.1)
55–64	708 (21.4)	81 (17.5)	630 (19.1)	79 (17.0)
65 and older	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Female, n (%)	1696 (51.3)	182 (39.2)	1662 (50.3)	177 (38.2)
Region, n (%)				
Northeast	525 (15.9)	85 (18.3)	540 (16.3)	79 (17.0)
North central	707 (21.4)	58 (12.5)	706 (21.4)	56 (12.1)
South	1520 (46.0)	226 (48.7)	1505 (45.5)	227 (48.9)
West	532 (16.1)	95 (20.5)	528 (16.0)	102 (22.0)
Unknown	21 (0.6)	0 (0.0)	26 (0.8)	0 (0.0)
Industry, n (%)				
Oil and Gas Extraction, Mining	30 (0.9)	0 (0.0)	15 (0.5)	0 (0.0)
Manufacturing, Durable Goods	489 (14.8)	37 (8.0)	561 (17.0)	112 (24.1)
Manufacturing, Nondurable Goods	224 (6.8)	51 (11.0)	240 (7.3)	77 (16.6)
Transportation, Communications, Utilities	725 (21.9)	376 (81.0)	479 (14.5)	275 (59.3)
Retail Trade	94 (2.8)	0 (0.0)	63 (1.9)	0 (0.0)
Finance, Insurance, Real Estate	219 (6.6)	0 (0.0)	251 (7.6)	0 (0.0)
Services	474 (14.3)	0 (0.0)	511 (15.5)	0 (0.0)
Agriculture, Forestry, Fishing	1 (0.0)	0 (0.0)	1 (0.0)	0 (0.0)
Construction	11 (0.3)	0 (0.0)	7 (0.2)	0 (0.0)
Wholesale	20 (0.6)	0 (0.0)	19 (0.6)	0 (0.0)
Missing	1018 (30.8)	0 (0.0)	1158 (35.0)	0 (0.0)
Data supplied by, n (%)				
Employer	2509 (75.9)	464 (100.0)	2333 (70.6)	464 (100.0)
Health plan	796 (24.1)	0 (0.0)	972 (29.4)	0 (0.0)
Weighted CCI score, n (%)				
Mean (SD)	0.2 (0.8)	0.1 (0.5)	0.3 (0.8)	0.2 (0.6)
0	2865 (86.7)	415 (89.4)	2808 (85.0)	404 (87.1)
1–2	397 (12.0)	48 (10.3)	435 (13.2)	54 (11.6)
3–4	28 (0.9)	1 (0.2)	44 (1.3)	5 (1.1)
5+	15 (0.5)	0 (0.0)	18 (0.5)	1 (0.2)
IBD type, n (%)				
CD only	—	—	1160 (35.1)	140 (30.2)
UC only	—	—	1525 (46.1)	220 (47.4)
CD and UC	_		620 (18.8)	104 (22.4)

CCI, Charlson comorbidity index; CD, Crohn's disease; HPM, Health and Productivity Management; IBD, inflammatory bowel disease; SD, standard deviation; UC, ulcerative colitis. Percentages may not add up to 100% due to rounding.

Figure 4. Mean Time Spent on Medical Visits (A) and Time Reported in HPM Claims (B) in Patients With IBD Compared to Control Patients



HPM, Health Productivity and Management; IBD, inflammatory bowel disease; SD, standard deviation.



• Several demographic measures differed between the total population and the HPM subset, including sex, employment industry, and data origin

• Mean hours spent on medical visits were substantially higher in patients with IBD compared to their matched control patients (Figure 4A) • The time reported in HPM claims were comparable between IBD and control patients (Figure 4B)

- Patients with IBD spent significantly more time on medical visits compared to controls (*P* < .001) (Figure 5)
- compared to controls (Figure 6) (*P* <.05) (Figure 7)
- No significant annual cost differences were seen between patients with IBD and controls when looking at time reported in HPM claims

Total Population (A) and the HPM Subset (B)



CD, Crohn's disease; CI, confidence interval; HPM, Health Productivity and Management; IBD, inflammatory bowel disease; UC, ulcerative colitis ^aPatients with medical claims for both CD and UC. ^bPatients with medical claims for CD, UC, or CD and UC. ^cExcluding weekends

Figure 6. Difference Between Patients With IBD Compared to Controls in Total Time Reported in HPM Claims (A), Absenteeism (B), and Disability Claims (C): HPM Subset



confidence interval: HPM. Health Productivity and Management: IBD. inflammatory bowel disease: UC. ulcerative coliti atients with medical claims for both CD and UC. Patients with medical claims for CD, UC, or CD and UC. Total time equals the sum of work hours lost from absenteeism and disability claims. The number of lost days taken from disability claims were converted to hours, assuming 8 hours per lost day

Figure 7. Difference in Cost of WPL Between Patients With IBD and Controls When Using Different **Methods of WPL Estimation**



CD, Crohn's disease; IBD, inflammatory bowel disease; UC, ulcerative colitis; WPL, work productivity loss. *P <.05, compared to non-IBD patients. a Total time equals the sum of work hours lost from absenteeism and disability claims. Patients with medical claims for both CD and UC. Patients with medical claims for CD, UC, or CD and UC.

LIMITATIONS

- severity and selection bias, that cannot be eliminated
- insurance or without health insurance
- This analysis does not take presenteeism into consideration, so these results likely underestimate the true effect on WPL

Work Productivity Loss (WPL) Calculation

 Among all identified patients (regardless of the link to HPM data) and within the subset of patients linked to HPM data (HPM subset), IBD-related WPL was estimated as the difference between IBD and control patients in time spent on medical visits based on insurance claims during the follow-up period (**Figure 2**)

• In the HPM subset, WPL was also calculated as the difference between IBD and control patients in total time (absenteeism + short/long-term disability) reported in HPM claims during the follow-

• The cost of IBD-related WPL was calculated as WPL multiplied by the 2022 average hourly compensation rate (\$29.43/hour) from the US Social Security Administration

Figure 2. Lost Time Estimates

nt on isitsª	Telehealth: 2 hoursEmergency: 8 hours	Other outpatient: 4 hoursInpatient: 8 hours/day
ted in ms	 Absenteeism: taken directly from claim 	 Disability days^b: 8 hours/day

Excluding weekends. ^bLong-term disability days in the claim may include days covered in absenteeism or short-term disability days; overlapped days were removed to avoid double counting

• There were no statistically significant differences in total time reported in HPM claims, absenteeism, or disability claims in patients with any type of IBD

• Patients with IBD had significantly greater costs (CD: \$1678; UC: \$1112) estimated by time spent on medical visits, compared to non-IBD patients

Figure 5. Difference Between Patients With IBD and Controls in Time Spent on Medical Visits in the



• The study matches cases and controls based on several important characteristics, but there might be unobservable confounding factors, like disease • This study only includes individuals with commercial health coverage so these results may not be generalizable to IBD patients with other types of • Costs are estimated based on a nationally average hourly wage, which might differ from the true indirect costs based on the patients' specific jobs