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# National Health Statistics Reports

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Number 152 ■ February 24, 2021

## Health Care Utilization Among U.S. Adults With Inflammatory Bowel Disease, 2015–2016

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### Abstract

**Objective**—To measure health care utilization among adults with inflammatory bowel disease (IBD) and compare with adults without IBD.

**Methods**—Adults aged 18 and over with IBD (1.2%) and without IBD were identified from the 2015 and 2016 National Health Interview Survey ( $n = 66,610$ ). This study presents age-adjusted percentages and model-adjusted prevalence ratios (APRs) of selected health service use to identify differences by IBD status. IBD status and use of health care services are based on self-reports.

**Results**—Compared with adults without IBD, adults with IBD were more likely to have visited any doctor or mental health provider in the past 12 months. IBD was also associated with higher prevalence of being prescribed medication, and having received acute care services, such as emergency room visits, overnight hospitalizations, or surgeries. Differences by IBD status were greatest for visiting a specialist (APR: 1.98; 95% confidence interval [CI]: 1.82–2.14) and home visits (APR: 1.80; 95% CI: 1.25–2.59) in the past 12 months.

**Conclusions**—Adults with IBD had higher health service use than adults without IBD. Future studies may assess patient characteristics and outcomes associated with increased utilization among IBD patients.

**Keywords:** IBD • ulcerative colitis • Crohn’s disease • National Health Interview Survey

### Introduction

Inflammatory bowel disease (IBD), which includes Crohn’s disease and ulcerative colitis, causes chronic inflammation in the gastrointestinal tract. In 2015 and 2016, an estimated 3.1 million (1.2%) U.S. adults reported having received a diagnosis of IBD (1). While IBD is generally nonfatal,

people with IBD are often heavy users of the health care system. IBD patients often take medications and visit doctors frequently to achieve and maintain remission, and severe cases or those not responding to medications may require hospitalizations and surgeries (2,3). Adults with IBD are also more likely to have comorbidities, such as cardiovascular disease, cancer, arthritis,

and liver conditions (1). As IBD patients are usually immunocompromised (4), complications and disease management all contribute to greater health care utilization. This high utilization may lead to increased medical cost and increased financial burden of care for people with IBD.

While previous work has examined health behaviors (1) and preventive services use among adults with IBD (5), recent nationally representative data on overall health care use for this population are lacking. This report uses data from the National Health Interview Survey (NHIS) to provide nationally representative estimates of utilization of selected health care services among adults with IBD and examines differences in utilization compared with adults without IBD.

### Methods

Data were drawn from 66,610 sample adults aged 18 and over who participated in either the 2015 or 2016 NHIS. A multipurpose, nationally representative health survey of the civilian, noninstitutionalized U.S. population, NHIS is conducted annually by the National Center for Health Statistics. Interviewers with



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the U.S. Census Bureau administer the questionnaire using computer-assisted personal interviewing. Telephone interviewing is permitted to complete missing portions of the interview. NHIS consists of both a core set of questions that remain relatively unchanged from year to year, as well as supplemental questions that are not asked every year. The question regarding diagnosis of Crohn's disease or ulcerative colitis was included as a 2-year supplement in the Sample Adult interview in the 2015–2016 NHIS. The final response rate for the Sample Adult module was 55.2% in 2015 and 54.3% in 2016 (6,7).

Age-adjusted percentages and 95% confidence intervals (CI) are presented for selected health service utilization measures by IBD status, using the projected 2000 U.S. population as the standard population (8). Also presented are adjusted prevalence ratios (with 95% CI) derived from multivariable logistic regression models, controlling for possible confounders (5): age, race and Hispanic origin, sex, marital status, education, employment status, health insurance coverage, poverty level (calculated using NHIS imputed income files), and region. As the purpose of this analysis was to measure the total health care utilization among adults with IBD more generally, models did not control for comorbidities. Details on the outcome measures included in this report can be found in [Table 1](#).

All analyses were weighted using final sample adult weights adjusted for nonresponse and calibrated to population control totals and conducted in SAS-callable SUDAAN 11.0.3 software (RTI International, Research Triangle Park, North Carolina) to account for the stratified, complex cluster sampling design of NHIS. All differences discussed are significant ( $p < 0.05$ ) unless otherwise noted.

## Results

In 2015 and 2016, utilization was higher for all measures among the 1.2% of adults with IBD compared with adults without IBD ([Table 2](#)). Details on the distributions of sociodemographic characteristics of adults with and without IBD using these data have been published

elsewhere (5). The percentage who had seen or talked to a health professional in the past 12 months was higher among adults with IBD than among adults without IBD. In particular, adults with IBD were nearly twice as likely to have seen a specialist in the past 12 months, and 74% more likely to have seen a mental health provider in the past 12 months compared with adults without IBD. Adults with IBD were 32% more likely to have been prescribed any medication in the past 12 months and 80% more likely to have had any home visits in the past 12 months compared with adults without IBD. The percentage of adults with IBD who had visited a health professional in an office, clinic, or some other place four or more times in the past 12 months was higher than among those without IBD. Finally, adults with IBD were also more likely to report any emergency room visits, overnight hospital stays, and surgeries in the past 12 months.

## Discussion

This study presents overall health care use among adults with IBD compared with adults without IBD using a recent, nationally representative data source. Adults with IBD had higher health service use than adults without IBD for all measures examined in this study.

This finding is consistent with several other studies (3,9,10), despite differences in year, data source (e.g., survey data, insurance claims data), or scope of coverage (e.g., national, regional, commercially insured). For example, prior studies have found that those with IBD were more likely to have used prescription medication in the past 3 months, as well as to have visited a physician, a specialist, an emergency room, and have had hospitalizations and surgeries in the past 12 months, compared with adults without IBD (3,9,10). In one study, adults who were diagnosed with IBD 16 years earlier were still more likely to have used prescription medication in the past 3 months, visited an emergency room, or seen a specialist in the past 12 months, compared with adults without IBD (3). Another study found that from 2005

through 2016, emergency department visits and hospital admissions for IBD-related care have been increasing. This change was more likely to be seen among patients who were inadequately insured, socioeconomically disadvantaged, or had limited access to health care (11). While IBD-specific surgery rates have been decreasing recently, likely due to newer, effective treatments and medications developed for IBD (12), adults with IBD had a higher likelihood of having any surgery compared with those without IBD. This study found that specialist visits were more common among adults with IBD than among adults without IBD. Although NHIS does not collect details about specific medical specialties, other studies have also shown that visits to gastroenterologists were more frequent among those with IBD (9). Furthermore, adults with IBD were more likely to have seen a mental health professional in the past 12 months compared with adults without IBD. Many studies have shown that mental health conditions are prevalent among IBD patients (13–15), with one systematic review finding prevalence rates of 20% for anxiety, and 15% for depression (13). However, other studies have found that one-third of IBD patients who met diagnostic criteria for depression and two-thirds of those who met diagnostic criteria for anxiety were undiagnosed, which indicates that the true prevalence of mental health conditions may be even higher in this population (16).

This report does not differentiate the reasons for health service use; it measures the overall utilization among adults with and without IBD. These findings of higher utilization among those with IBD may reflect both care for IBD as well as for comorbidities, which are known to be more prevalent among those with IBD. This high overall utilization may lead to increased medical cost. Based on an estimated 1.6 million people diagnosed with IBD, the annual direct and indirect costs of IBD in the United States was estimated to be between \$14.6 billion and \$31.6 billion (17). However, a more recent national study using NHIS data estimated that 3.1 million adults have IBD (1); therefore, the current total costs of IBD in the United States may be much higher. Furthermore, total direct costs

of IBD have been increasing in recent years, likely a result of increased use of biologic medications (18). Biologic medications involve infusions and are considerably more expensive than other forms of IBD medication (19). Other factors, such as use of corticosteroids or frequent hospitalizations, have also been determined to be predictors of particularly high utilization and costs among IBD patients (20).

The primary advantage of this study is the use of a large, nationally representative data source to provide more recent estimates of several measures of health care utilization among adults with IBD. However, this report is subject to at least four limitations. First, because NHIS responses are self-reported and not corroborated by medical records, they are subject to reporting bias. Second, the question about IBD status did not differentiate Crohn's disease from ulcerative colitis. Therefore, assessing health care utilization by specific condition is not possible. Third, as respondents were not asked the reasons for receiving health care services, it is not clear how much health care received by adults with IBD was due to their IBD or due to other, non-IBD reasons (e.g., comorbidities, accidents, or injuries). Lastly, institutionalized adults are not included in the NHIS sample. These adults may have high health care use, so estimates of health care use presented in this report may be an underestimate.

In conclusion, these estimates of higher health care services use among adults with IBD, compared with those without IBD, provide a reference of the burden experienced by these patients and the impact on the U.S. health care system, and can inform physicians and health care policy makers aiming to improve IBD care by increasing important preventive care utilization and minimizing potentially avoidable health services. Future studies may assess associations between patient characteristics and health care utilization and the subsequent outcomes among IBD patients.

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**Table 1. List of survey questions and variable definition of selected health care utilization measures**

Health care utilization measure	2015–2016 NHIS question <sup>1</sup>	Type of respondent
Seen or talked to any health care professional in past 12 months	About how long has it been since you last saw or talked to a doctor or other health care professional about your own health? Include doctors seen while a patient in a hospital.	Sample adult
Seen or talked to a specialist in past 12 months	[During the past 12 months, have you seen or talked to any of the following health care providers about your own health?.....] A medical doctor who specializes in a particular medical disease or problem (other than obstetrician/gynecologist, psychiatrist, or ophthalmologist)?	Sample adult
Seen or talked to a mental health professional in past 12 months	[During the past 12 months, have you seen or talked to any of the following health care providers about your own health?.....] A mental health professional such as a psychiatrist, psychologist, psychiatric nurse, or clinical social worker.	Sample adult
Prescribed any medication in past 12 months	During the past 12 months, were you prescribed medication by a doctor or other health professional?	Sample adult
Had four or more office visits with a health professional in past 12 months	During the past 12 months, how many times have you seen a doctor or other health care professional about your own health at a doctor's office, a clinic, or some other place? Do not include times you were hospitalized overnight, visits to hospital emergency rooms, home visits, dental visits, or telephone calls.	Sample adult
Any home visits in past 12 months	During the past 12 months, did you receive care at home from a nurse or other health care professional?	Sample adult
Any visits to a hospital emergency room in past 12 months	During the past 12 months, how many times have you gone to a hospital emergency room about your own health (This includes emergency room visits that resulted in a hospital admission.)?	Sample adult
Any overnight hospital stays in past 12 months	[Have you/Including all infants born in a hospital, has anyone in the family] been hospitalized overnight in the past 12 months? Do not include an overnight stay in the emergency room.  If yes: Who was in a hospital overnight?	Family respondent <sup>2</sup>
Any surgeries in past 12 months	During the past 12 months, have you had surgery or other surgical procedures either as an inpatient or outpatient?	Sample adult

<sup>1</sup>More information about the survey questionnaire is available at the following websites: 2015 National Health Interview Survey: [ftp://ftp.cdc.gov/pub/Health\\_Statistics/NCHS/Survey\\_Questionnaires/NHIS/2015/english/qadult.pdf](ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnaires/NHIS/2015/english/qadult.pdf), [ftp://ftp.cdc.gov/pub/Health\\_Statistics/NCHS/Survey\\_Questionnaires/NHIS/2015/english/qfamily.pdf](ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnaires/NHIS/2015/english/qfamily.pdf); 2016 National Health Interview Survey: [ftp://ftp.cdc.gov/pub/Health\\_Statistics/NCHS/Survey\\_Questionnaires/NHIS/2016/english/qadult.pdf](ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnaires/NHIS/2016/english/qadult.pdf), [ftp://ftp.cdc.gov/pub/Health\\_Statistics/NCHS/Survey\\_Questionnaires/NHIS/2016/english/qfamily.pdf](ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnaires/NHIS/2016/english/qfamily.pdf).

<sup>2</sup>Measure is based on report about the sample adult from the family respondent. In some cases, the family respondent is selected as the sample adult, but if not, this measure is based on a proxy report.

NOTE: Data are based on household interviews of a sample of the civilian noninstitutionalized population.

SOURCE: National Center for Health Statistics, National Health Interview Survey, 2015–2016, Family Core and Sample Adult Core components.

**Table 2. Health care utilization, by inflammatory bowel disease status among adults aged 18 and over: United States, 2015–2016**

Health care utilization measure <sup>1</sup>	Total		Adults with IBD		Adults without IBD		Model-adjusted prevalence ratio <sup>4</sup> (95% CI)
	<i>n</i> <sup>2</sup>	Percent <sup>3</sup> (95% CI)	<i>n</i> <sup>2</sup>	Percent <sup>3</sup> (95% CI)	<i>n</i> <sup>2</sup>	Percent <sup>3</sup> (95% CI)	
Seen or talked to any health professional in past 12 months	55,877	83.3 (82.8–83.7)	891	†92.6 (89.7–94.9)	54,905	83.2 (82.7–83.6)	‡1.08 (1.05–1.11)
Seen or talked to a specialist in past 12 months	18,955	26.0 (25.5–26.5)	558	†57.9 (52.6–62.9)	18,365	25.6 (25.2–26.1)	‡1.98 (1.82–2.14)
Seen or talked to a mental health professional in past 12 months	5,848	8.4 (8.1–8.7)	154	†18.8 (14.6–23.6)	5,688	8.3 (7.9–8.6)	‡1.74 (1.41–2.16)
Prescribed any medication in past 12 months	44,099	62.1 (61.5–62.6)	830	†86.0 (82.4–89.2)	43,209	61.8 (61.3–62.4)	‡1.32 (1.26–1.37)
Had four or more office visits with a health professional in past 12 months	26,045	36.2 (35.6–36.7)	592	†57.7 (52.6–62.7)	25,414	35.9 (35.4–36.4)	‡1.48 (1.37–1.59)
Any home visits in past 12 months	2,357	2.6 (2.4–2.7)	67	†5.9 (3.7–8.8)	2,285	2.6 (2.4–2.7)	‡1.80 (1.25–2.59)
Any visits to a hospital emergency room in past 12 months	13,373	19.0 (18.6–19.5)	321	†34.5 (29.6–39.6)	13,028	18.8 (18.4–19.3)	‡1.65 (1.45–1.88)
Any overnight hospital stays in past 12 months	6,524	8.4 (8.1–8.7)	185	†17.3 (13.8–21.3)	6,330	8.3 (8.0–8.6)	‡1.64 (1.36–1.98)
Any surgeries in past 12 months	8,622	11.8 (11.4–12.1)	217	†22.0 (17.9–26.6)	8,396	11.6 (11.3–12.0)	‡1.57 (1.32–1.88)

† Significantly different from that among adults without IBD ( $p < 0.05$ ).

‡ The difference between the estimate among adults with IBD and that among adults without IBD was statistically significant ( $p < 0.05$ ) after adjusting for covariates in the models.

<sup>1</sup>Definitions of health care utilization variables can be found in Table 1.

<sup>2</sup>Unweighted number of participants who had received the selected service. Sample sizes may not sum to total due to missing IBD status.

<sup>3</sup>Estimates are weighted and age-adjusted using the projected 2000 U.S. population distribution #10 (<https://www.cdc.gov/nchs/data/statnt/statnt20.pdf>).

<sup>4</sup>Prevalence ratios were derived from logistic regression models adjusted for age, race and Hispanic origin, sex, marital status, education, employment status, health insurance coverage, poverty level, and region.

NOTES: IBD is inflammatory bowel disease. CI is confidence interval. Data are based on household interviews of a sample of the civilian noninstitutionalized population.

SOURCE: National Center for Health Statistics, National Health Interview Survey, 2015–2016, Family Core and Sample Adult Core components.

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National Health Statistics Reports ■ Number 152 ■ February 24, 2021

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**Suggested citation**

Terlizzi EP, Dahlhamer JM, Xu F, Wheaton AG, Greenlund KJ. Health care utilization among U.S. adults with inflammatory bowel disease, 2015–2016. National Health Statistics Reports; no 152. Hyattsville, MD: National Center for Health Statistics. 2021. DOI: <https://doi.org/10.15620/cdc:100471>.

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