Prevalence of Inflammatory Bowel Disease Among Adults Aged ≥18 Years — United States, 2015

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Crohn's disease and ulcerative colitis, collectively known as inflammatory bowel disease (IBD), are characterized by chronic inflammation of the gastrointestinal tract (*1*). IBD has been associated with poor quality of life and extensive morbidity and often results in complications requiring hospitalizations and surgical procedures (*2–4*). Most previous studies of IBD have used administrative claims data or data collected from limited geographic areas to demonstrate increases in estimated prevalence of IBD within the United States (*5,6*). Few national prevalence estimates of IBD among adults based on large, nationally representative data sources exist, and those that do tend to be based on older data. For example, the most recent national study used 1999 National Health Interview Survey (NHIS) data and estimated that 1.8 million (0.9%) U.S. adults had IBD (*7*). To examine the prevalence of IBD among the civilian, noninstitutionalized U.S. adult population, data from the 2015 NHIS were analyzed. Overall, an estimated 3.1 million, or 1.3%, of U.S. adults have received a diagnosis of IBD. Within population subgroups, a higher prevalence of IBD was identified among adults aged ≥45 years, Hispanics, non-Hispanic whites, and adults with less than a high school level of education, not currently employed, born in the United States, living in poverty, or living in suburban areas. The use of a nationally representative data source such as the NHIS to estimate the prevalence of IBD overall and by population subgroups is important to understand the burden of IBD on the U.S. health care system.

NHIS is a household survey that provides nationally representative estimates on a broad range of health measures for the civilian, noninstitutionalized population. Data on IBD were collected in the Sample Adult Core component of the survey. In this component, the respondent (i.e., the sample adult) is randomly selected from among all adults aged ≥18 years in the family. A proxy respondent might respond for the sample adult if, because of health reasons, the sample adult is physically or mentally unable to respond themselves.* Respondents were identified as having a diagnosis of IBD if they responded affirmatively to the question, "Have you ever been told by a doctor or other health professional that you had Crohn's disease or ulcerative colitis?" The 2015 NHIS Sample Adult Core consisted of 33,672 adults and had a final response rate of 55.2%. Sociodemographic characteristics were collected in the NHIS Household Module and Family Core components of the survey.

The number of IBD cases and prevalence of IBD (with accompanying 95% confidence intervals) were estimated for the civilian, noninstitutionalized U.S. adult population overall and by various sociodemographic characteristics, including sex, age, race/ethnicity, education level, marital status, current employment status, nativity, health insurance coverage type (reported separately for adults aged <65 years and ≥65 years), poverty status (calculated using NHIS imputed income files), urbanicity, and region of residence. Comparisons among subgroups used age-adjusted estimates of IBD prevalence, which were calculated using the projected 2000 U.S. population as the standard population and four age groups: 18–24 years, 25–44 years, 45–64 years, and ≥65 years. All estimates meet the standards of reliability,† unless otherwise noted. Sampling weights were used for all estimates, and the complex sample design of the NHIS was accounted for by using SUDAAN 11.0 software for the analysis. For comparisons of prevalence between subgroups, statistical significance ($p<0.05$) was determined by two-tailed Z-tests. All reported differences between subgroups were statistically significant.

In 2015, an estimated 1.3% (1.2% age-adjusted) of U.S. adults (3.1 million) had ever received a diagnosis of IBD (Table). A higher percentage of adults aged 45–64 (1.5%) and ≥65 (1.7%) years had IBD compared with adults aged 18–24 (0.5%) and 25–44 (1.0%) years. Hispanics (1.2%) and non-Hispanic whites (1.4%) had a higher prevalence of IBD than did non-Hispanic blacks (0.5%). Adults with less than a high school level of education had a higher prevalence of IBD (1.7%) than did those with a bachelor's degree or higher (1.1%). Among adults not currently employed, 1.6% had ever received a diagnosis of IBD, compared with 1.2% of adults who were currently employed. Adults who were born in the United States had a higher prevalence of IBD (1.4%) than did adults who were not born in the United States (0.8%). Adults living in poverty (from families with incomes <100% of the federal

* 2015 National Health Interview Survey (NHIS) Public Use Data Release: Survey Description Document (ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHIS/2015/srvydesc.pdf).

† The National Center for Health Statistics' standard for reliability is for an estimate to have a relative standard error <30.0%, where the relative standard error is calculated by dividing the standard error of an estimate by the estimate itself, then multiplying by 100.

TABLE. Prevalence of inflammatory bowel disease* among U.S. adults aged ≥18 years, by sociodemographic characteristics — National Health Interview Survey, 2015

Characteristic	Adults with IBD	
	Estimated no.†	Age-adjusted§ % (95% CI)
Total (crude)	**3,087,000**	**1.3 (1.13–1.44)**
Total (age-adjusted)	**3,087,000**	**1.2 (1.09–1.40)**
Sex		
Men	1,315,000	1.1 (0.91–1.33)
Women	1,772,000	1.4 (1.16–1.59)
Age group (yrs)		
18–24	153,000	0.5¶ (0.28–0.93)
25–44	865,000	1.0 (0.83–1.31)
45–64	1,265,000	1.5 (1.25–1.86)
≥65	805,000	1.7 (1.40–2.15)
Race/ethnicity		
Hispanic	395,000	1.2 (0.82–1.64)
Non-Hispanic white	2,345,000	1.4 (1.23–1.64)
Non-Hispanic black	156,000	0.5 (0.36–0.77)
Non-Hispanic other**	190,000	1.0 (0.59–1.74)
Education level		
Less than high school	516,000	1.7 (1.24–2.41)
High school diploma/GED	773,000	1.3 (0.98–1.60)
Some college	945,000	1.3 (1.03–1.60)
Bachelor's degree or more	850,000	1.1 (0.84–1.33)
Current marital status		
Never married	447,000	1.1 (0.82–1.59)
Married/Cohabitating	1,868,000	1.2 (1.00–1.39)
Divorced/Separated	493,000	1.6 (1.17–2.13)
Widowed	279,000	—¶
Current employment		
Yes	1,528,000	1.2 (0.95–1.42)
No	1,559,000	1.6 (1.33–2.00)
U.S.-born		
Yes	2,719,000	1.4 (1.18–1.53)
No	369,000	0.8 (0.56–1.14)
Health insurance coverage††		
Age <65 years		
Private	1,441,000	1.0 (0.86–1.25)
Medicaid	348,000	1.4 (0.96–2.11)
Other	210,000	1.5 (0.99–2.36)
Uninsured	279,000	1.2 (0.76–1.83)
Age ≥65 years		
Private	425,000	1.9 (1.36–2.57)
Medicare and Medicaid	88,000	2.7 (1.54–4.78)
Medicare only	251,000	1.5 (1.03–2.30)
Other	41,000	1.1¶ (0.44–2.54)
Uninsured§§	NA	NA
Poverty status		
<100% FPL	496,000	1.8 (1.32–2.43)
100% to <200% FPL	552,000	1.2 (0.86–1.63)
200% to <400% FPL	945,000	1.3 (1.03–1.63)
≥400% FPL	1,095,000	1.1 (0.84–1.30)
Urbanicity		
MSA, central city	790,000	1.0 (0.77–1.25)
MSA, noncentral city	1,855,000	1.4 (1.20–1.67)
Not in MSA	442,000	1.2 (0.85–1.61)
Region		
Northeast	597,000	1.4 (1.08–1.90)
Midwest	682,000	1.2 (0.93–1.56)
South	1,183,000	1.3 (1.03–1.55)
West	625,000	1.1 (0.85–1.42)

Abbreviations: CI = confidence interval; FPL = federal poverty level; GED = General Educational Development high school equivalency diploma; IBD = inflammatory bowel disease; MSA = metropolitan statistical area; NA = not applicable.

* Respondents who had ever been told by a doctor or other health professional that they had Crohn's disease or ulcerative colitis.

† Estimated number rounded to 1,000s. Counts for adults of unknown status (i.e., responses coded as "refused," "don't know," or "not ascertained") with respect to IBD status are not shown separately in the table or included in the calculation of percentages (as part of either denominator or the numerator), to provide a more straightforward presentation of the data. In addition, frequencies presented in the table might be underestimated because of item nonresponse and unknowns.

§ Estimates are age-adjusted using the projected 2000 U.S. population as the standard population and four age groups: 18–24, 25–44, 45–64, and ≥65 years.

¶ Estimates are considered unreliable according to the standards of reliability. Estimates with a relative standard error (RSE) >30.0% and ≤50.0% are still shown, but should be used with caution. Estimates not shown have an RSE >50.0%.

** "Non-Hispanic other" includes non-Hispanic American Indian and Alaska Native only; non-Hispanic Asian only; non-Hispanic Native Hawaiian and Pacific Islander only; and non-Hispanic multiple race.

†† Based on a hierarchy of mutually exclusive categories. Adults with more than one type of health insurance were assigned to the first appropriate category in the hierarchy. "Uninsured" includes adults who had no coverage and those who had only Indian Health Service coverage or had only a private plan that paid for one type of service, such as accidents or dental care.

§§ In the survey sample, there were zero adults aged ≥65 years and uninsured who had ever been told by a doctor or other health professional that they had Crohn's disease or ulcerative colitis.

poverty level§) had a higher prevalence of IBD (1.8%) than did adults from families with incomes ≥400% of the federal poverty level (1.1%). Finally, adults living outside the central city of a metropolitan statistical area (MSA¶) had a higher prevalence of IBD (1.4%) than did adults living in the central or principal city of an MSA (1.0%). The prevalence of IBD did not differ by sex, current marital status, health insurance coverage type, or region of residence.

§ Federal poverty levels are updated annually by the U.S. Census Bureau (https://aspe.hhs.gov/2015-poverty-guidelines). Percentage of poverty relative to the federal poverty level is used to define poverty status, and is calculated, using NHIS imputed income files, as total family income divided by the family's corresponding federal poverty level, and multiplied by 100.

¶ A metropolitan statistical area (MSA) is defined as a county or group of contiguous counties that contain at least one urbanized area of 50,000 population or more. Adults were defined as living in the central or principal city of an MSA (MSA, central city), in an MSA but not in the central city (MSA, noncentral city), or not in a MSA. "Not in a MSA" indicates that the adults lives in a nonmetropolitan area, defined as an area that does not include a large urbanized area; these areas are generally thought of as more rural.

Discussion

Approximately 3 million U.S. adults are estimated to have ever received a diagnosis of IBD, a disease that is associated with decreased quality of life, substantial morbidity, and complications requiring hospitalizations and surgical procedures (*2*–*4*). This is almost three times the number of adults previously estimated to have IBD based on administrative data sources and limited geographic coverage (*6*,*8*,*9*).

Differences in IBD prevalence among a number of sociodemographic subgroups reveal that prevalence is not uniform across the U.S. adult population. Consistent with past research that found the prevalence of both Crohn's disease and ulcerative colitis increase with age (*8*), a higher prevalence of IBD was found among adults aged ≥45 years in this nationally representative population. Furthermore, a significantly higher prevalence of IBD among non-Hispanic whites was found, consistent with racial/ethnic differences previously reported using 1999 NHIS data (*7*). However, other results differed from previous reports. For example, although the current study found no significant differences in the prevalence of IBD by health insurance coverage type among adults aged <65 years or ≥65 years, previous analyses using claims data found that commercially insured persons had a higher prevalence of IBD than did persons insured by Medicaid (*5*). Furthermore, significant regional (*5*,*7*,*8*) and sex (*7*,*8*) differences identified in past research were not found in this study. Finally, significant differences among sociodemographic characteristics such as education level, employment status, nativity, and poverty status were identified in this study, but not elsewhere. Other researchers have speculated that subgroup differences likely exist for many of the same measures, but small sample sizes and less heterogeneous populations have limited their ability to produce stable, reliable estimates (*9*). Inconsistencies in findings might also be attributable to differences in data collection methods (e.g., survey data versus claims data) and geographic coverage (e.g., county level versus national level).

The findings in this report are subject to at least five limitations. First, only diagnosed Crohn's disease and ulcerative colitis cases were included; data for undiagnosed conditions are not collected by the NHIS. Second, because the majority of data from the NHIS Sample Adult Core component are self-reported and not corroborated with medical records, a potential for recall bias might exist. Third, the NHIS sample design does not include adults in long-term care facilities; these persons were excluded from the study. Active duty military personnel and incarcerated persons were also excluded. This limits the generalizability of the results to the civilian, noninstitutionalized population. Fourth, most IBD prevalence estimates met the standards of reliability; however, for widowed adults and adults aged 18–24 years, these standards were not met. Finally, although survey weights were adjusted after data collection to ensure national generalizability, the 2015 NHIS Sample Adult Core's response rate (55.2%) signals the potential for nonresponse bias in the IBD estimates.

Previous research indicates the burden of IBD to be extensive, including decreased health-related quality of life (*2*), high hospitalization rates (8.2–17.1 per 100,000 persons with IBD annually) (*3*), and direct treatment costs estimated to exceed 6.8 billion dollars in 2008 (*10*). Understanding the prevalence of IBD in the United States is important to both identify the health and financial burdens created by this disease and to inform policy and resource allocation (*5*). Examination of 2015 NHIS data indicates that the prevalence of IBD among adults has increased and far exceeds estimates based on non–nationally representative data sources. Using the NHIS to monitor the prevalence of IBD among U.S. adults can enhance understanding of the health and financial burdens IBD places on the U.S. health care system and help identify subgroups with higher prevalence rates who might be most in need of resources to manage and treat this potentially fatal chronic disease (*7*).

Summary

What is already known about this topic?

Crohn's disease and ulcerative colitis, collectively known as inflammatory bowel disease, are characterized by chronic inflammation of the gastrointestinal tract. Inflammatory bowel disease has been associated with decreased quality of life and extensive morbidity and often results in complications requiring hospitalizations and surgical procedures. In 1999, an estimated 1.8 million (0.9%) U.S. adults had inflammatory bowel disease.

What is added by this report?

In 2015, an estimated 3.1 million (1.3%) of U.S. adults had ever received a diagnosis of inflammatory bowel disease, and prevalence differed significantly among a number of sociodemographic characteristics, including age, race/ethnicity, education level, employment status, nativity, poverty status, and urbanicity. This study is one of the few times that inflammatory bowel disease prevalence estimates among U.S. adults have been assessed for a wide range of respondent characteristics using a large, nationally representative data source.

What are the implications for public health practice?

The use of a nationally representative data source such as the National Health Interview Survey to estimate the prevalence of inflammatory bowel disease among U.S. adults is important to understanding the burden this disease currently places on the U.S. health care system. Highlighting population subgroups with higher prevalence rates of inflammatory bowel disease can enable a better understanding of the disease and the populations most affected.

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