

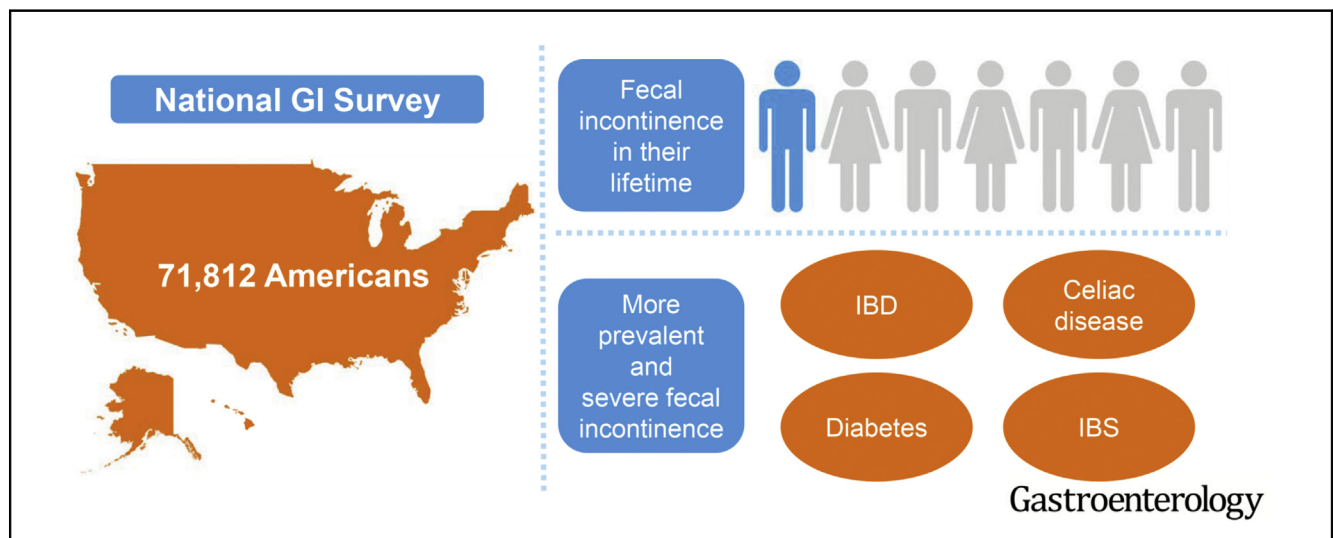


# Prevalence of and Factors Associated With Fecal Incontinence: Results From a Population-Based Survey

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This article has an accompanying continuing medical education activity, also eligible for MOC credit, on page e25. Learning Objective: Upon completion of this CME activity, successful learners will be able to identify factors that are associated with the prevalence and severity of fecal incontinence.



See Covering the Cover synopsis on page 1561.

**BACKGROUND & AIMS:** Fecal incontinence (FI) is characterized by uncontrolled passage of solid or liquid stool. We aimed to determine the prevalence and severity of FI in a large sample of US residents. **METHODS:** We recruited a representative sample of patients in October 2015 to complete the National Gastrointestinal (GI) Survey; a mobile app called MyGiHealth was used to systematically collect data on GI symptoms. FI was defined as accidental leakage of solid or liquid stool. Severity of FI was determined by responses to the National Institutes of Health FI Patient Reported Outcomes Measurement Information System questionnaire. Multivariable regression models were used to identify factors associated with FI prevalence and severity. **RESULTS:** Among 71,812 individuals who completed the National GI Survey, 14.4% reported FI in the past; of these, 33.3% had FI within

the past 7 days. Older age, male sex, and Hispanic ethnicity increased the likelihood of having FI within the past week. Individuals with Crohn's disease, ulcerative colitis, celiac disease, irritable bowel syndrome, or diabetes were more likely to report FI. Non-Hispanic black and Hispanic individuals and individuals with Crohn's disease, celiac disease, diabetes, human immunodeficiency virus/acquired immunodeficiency syndrome, or chronic idiopathic constipation had more severe symptoms of FI than individuals without these features. **CONCLUSIONS:** In a large population-based survey, 1 in 7 people reported previous FI. FI is age-related and more prevalent among individuals with inflammatory bowel disease, celiac disease, irritable bowel syndrome, or diabetes than people without these disorders. Proactive screening for FI among these groups is warranted.

**Keywords:** IBS; Incidence; Epidemiology; Risk Factors.

**EDITOR'S NOTES****BACKGROUND AND CONTEXT**

Estimates of fecal incontinence (FI) prevalence vary from 2-25%. Prior studies are limited by the lack of large-scale sampling, different definitions, and differences in study populations.

**NEW FINDINGS**

In this large population-based survey of over 71,000 Americans, 1 in 7 people reported having previously experienced FI. FI is more prevalent among individuals with inflammatory bowel disease, celiac disease, irritable bowel syndrome, and diabetes compared to those without these disorders.

**LIMITATIONS**

The data for this study was acquired via an internet-based survey, so this may limit the generalizability with concerns of Internet accessibility.

**IMPACT**

This is the largest population-based study that specifically assesses the prevalence and predictors of FI and its severity.

Fecal incontinence (FI) is a disorder characterized by the uncontrolled passage of solid or liquid stool. It is a distressing problem for patients and is associated with poor quality of life and social isolation.<sup>1-5</sup> Patients are rarely forthcoming with their symptoms, as it is embarrassing to discuss or thought by patients to be an inevitable part of aging.<sup>6</sup> Additionally, physicians may be less likely to inquire about FI symptoms. Dunivan et al<sup>7</sup> found a prevalence of FI in a cross-sectional survey of health maintenance organization patients of 36.2%, but only 2.7% carried a medical diagnosis.

Due to different definitions and populations sampled, the prevalence of FI varies widely in the literature, ranging from 2.2% to 20.7%.<sup>8-13</sup> The most recent report from the US National Health and Nutrition Examination Survey looked at the prevalence of FI from 2005 to 2010.<sup>8</sup> Ditah et al<sup>8</sup> reported an overall prevalence of 8.4% (at least 1 episode of FI in the past 30 days) in noninstitutionalized US adults aged 20 years and older, which remained stable over 5 years. The authors also found a 1.1% prevalence of having at least 1 FI episode per week.

With our aging population, it is important to continue to understand the burden of FI, as it has been shown to be more prevalent with aging.<sup>9,14</sup> The US Census Bureau projects that the population aged 65 to 84 years will more than double to 89 million by 2050 and the population aged 85 years and older will more than triple to 19 million by that time as well.<sup>15</sup> Therefore, the aim of this study was to determine the prevalence and severity of FI in a large, representative sample of community-dwelling Americans.

## Materials and Methods

### Study Design, Data Source, and Study Population

To evaluate the burden of gastrointestinal (GI) illness within the United States, our group conducted the National GI

Survey in October 2015 among community-dwelling Americans.<sup>16-18</sup> This study was approved by the Cedars-Sinai Institutional Review Board (Pro41586).

The National GI Survey was based on *MyGiHealth*, a mobile app that systematically collects GI symptom information using a computer algorithm called AEGIS (Automated Evaluation of GI Symptoms). We describe the AEGIS algorithm in detail elsewhere.<sup>19</sup> Briefly, AEGIS first asked individuals which among 8 GI symptoms they had recently experienced, including FI, abdominal pain, bloat/gas, diarrhea, constipation, heartburn/reflux, disrupted swallowing, and nausea/vomiting. These symptoms are based on the National Institutes of Health (NIH) Patient Reported Outcomes Measurement Information System (PROMIS) framework of GI symptoms.<sup>20-22</sup> For each reported GI symptom, AEGIS guided patients through the corresponding GI PROMIS questionnaires to measure symptom severity as compared with population norms. Afterward, AEGIS guided respondents through questions drawn from a library of more than 300 symptom attributes measuring the timing, severity, frequency, location, quality, bother, and character of their GI symptoms, along with relevant comorbidities and demographics.

We partnered with Cint, a survey research firm, to recruit a representative sample of Americans for the National GI Survey. Quotas for age, sex, and region of the country (Northeast, South, Midwest, and West) were in place to ensure a population-based sample. Potential respondents were sent an e-mail through Cint research panels inviting them to complete an online survey. The e-mail included a link to the survey along with the following templated text, which was subject to editing from individual research panels: "Based on the information stored in your [research panel] profile, we believe we have a survey that you will qualify & earn from. The survey takes approximately 15 minutes and if you successfully complete it, your account will be credited with [incentive]." Users who clicked the link were then brought to the survey home page asking them to complete a "GI Survey"; no specific mentions of FI were made on the initial screen. Participant recruitment occurred in October 2015, and all individuals  $\geq 18$  years old were included.

Of note, the Cint platform uses a reward system based on marketplace points. The number of points awarded is driven by the length of interview. On reaching a certain redemption level, panelists can redeem their rewards through different online payment partners linked to Cint. The size of the redemption is based on the number of points earned. Panelists can choose to receive their rewards in cash sent to their bank accounts or they can shop online with participating merchants or make payments to a charity. Incentive levels have been set to encourage long-term participation and to discourage professional respondents who seek to take surveys only to obtain payment.

\*Authors share co-first authorship.

**Abbreviations used in this paper:** AEGIS, Automated Evaluation of GI Symptoms; AIDS, acquired immunodeficiency syndrome; CIC, chronic idiopathic constipation; FI, fecal incontinence; GI, gastrointestinal; HIV, human immunodeficiency virus; IBD, inflammatory bowel disease; IBS, irritable bowel syndrome; NIH, National Institutes of Health; PROMIS, Patient Reported Outcomes Measurement Information System; PW, population weighted.

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