

CHAPTER 16

Functional Intestinal Disorders

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Included in this chapter are separate entries on chronic constipation and irritable bowel syndrome (IBS). Other functional conditions that were either too uncommon or too nonspecific were functional diarrhea, neurogenic bowel and megacolon not elsewhere described, anal spasm, and other specified and unspecified functional intestinal disorders. These are included in the section All Functional Intestinal Disorders.

CHRONIC CONSTIPATION

In 2004, constipation was frequently noted at ambulatory care visits either as a first-listed diagnosis (3.1 million visits) or all-listed diagnoses (6.3 million visits) (Table 1), which made it the second most common ambulatory care diagnosis, after GERD. Persons under age 15 years had the highest number of visits for chronic constipation and nearly as great a rate as persons age 65 years and older. The number of ambulatory care visits for the younger age group was equal to that of intestinal infections (Chapter 2). Chronic constipation and GI infections were the two most common reasons for ambulatory care visits among children. Rates of visits with a chronic constipation diagnosis were also higher for blacks and for females. Hospitalizations with chronic constipation were uncommon, with first-listed diagnoses only 1–2 percent of ambulatory care visits. All-listed diagnoses of chronic constipation were more common—about one-tenth the rate of all-listed ambulatory care diagnoses. After many years of stable rates of medical care statistics for chronic constipation, there was a surge in both ambulatory medical care visits and hospitalizations between 1992 and 2004 (Figure 1), with more than a doubling of rates of ambulatory care diagnoses and nearly a fourfold increase in rates of hospital discharge diagnoses. The rate of ambulatory visits began to increase at least as early as 1985, when there were approximately 500 per 100,000 population.¹

Mortality from chronic constipation is, of course, rare (Table 2). Nevertheless, in keeping with the increase in medical care, there was an increase in constipation

as either underlying cause or underlying or other cause between 1989 and 2004 (Figure 2).

According to the Verispan database of retail pharmacy prescriptions (Appendix 2), in 2004, nearly half of all medications prescribed for chronic constipation were for the laxative polyethylene glycol (Table 3). Tegaserod (Zelnorm®), a medication for women with irritable bowel syndrome and constipation, was not as commonly prescribed, but was nearly as costly. Other medications were primarily stool softeners or motility agents. These data did not capture the very large number of nonprescription medications purchased for constipation.

IRRITABLE BOWEL SYNDROME

In 2004, there were 3 million ambulatory care visits with IBS noted as a diagnosis, and slightly more than half were first-listed diagnoses (Table 4). Unlike constipation, which was common among children, rates of visits with IBS increased with age only in later adulthood. Whites had more than twice the age-adjusted rate of visits as blacks. The rate of visits among females was more than 4 times that of males—the largest sex difference for any digestive disease. IBS was rarely noted as first-listed diagnosis on hospital discharge, but was much more commonly coded as a secondary diagnosis. The age, race, and sex patterns for all-listed discharge diagnosis were similar to ambulatory care diagnoses.

Age-adjusted rates of ambulatory care visits with an IBS diagnosis fell by about 20 percent between 1992–1993 and 2003–2005 (Figure 3), although the rate in the latest period was similar to rates in 1981, 1982, and 1985.² In contrast, rates of hospital discharges with a diagnosis of IBS fell in the mid-1980s, leveled off through the mid-1990s, and then increased by 81 percent between 1999 and 2004. IBS as underlying or contributing cause of death was exceedingly rare (Table 5), and trend data were not meaningful (Figure 4).

According to the Verispan database of retail pharmacies, in 2004, tegaserod (Zelnorm®) contributed much to the cost of IBS and was the third most widely prescribed drug (Table 6). The anticholinergic drugs hyoscyamine and dicyclomine were the most commonly prescribed drugs.

ALL FUNCTIONAL INTESTINAL DISORDERS

As a group of conditions, functional disorders were common reasons for outpatient visits, such that there were estimated to be more than 11 million ambulatory care visits noting these diagnoses in 2004 (Table 7), or about 4 visits per every 100 persons in the United States. Eighty percent of these visits were for either chronic constipation or IBS. Hospitalizations for functional disorders were uncommon, but they did commonly appear as an all-listed diagnoses. Recent increases in diagnoses with a mention of functional disorders on ambulatory care visits and hospital discharge were almost entirely due to increased rates of diagnoses of constipation (Figure 5). Chronic constipation and IBS accounted for 73.5 percent of these diagnoses. Functional disorders were coded as an underlying cause of death for 423 persons in 2004, and listed as a contributing cause for 1,766 persons (Table 8). The death rate with mention of functional intestinal conditions was stable from 1979 to 1999, when the change to ICD-10 coding resulted in a 19 percent increase that was likely a coding artifact (Figure 6).

According to the Verispan database of retail pharmacies, in 2004, there were estimated to be more than 13 million prescriptions filled at retail pharmacies at a cost of nearly three-quarters of a billion dollars (Table 9). Nearly one-third of this cost was for tegaserod (Zelnorm®). Other agents were primarily for pain, including several acid-blocking agents, or for constipation.

¹ Johanson JF. Constipation. In: Everhart JE, editor. *Digestive diseases in the United States: epidemiology and impact*. US Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases. Washington, DC: US Government Printing Office, 1994; NIH Publication No. 94-1447 pp. 567–593.

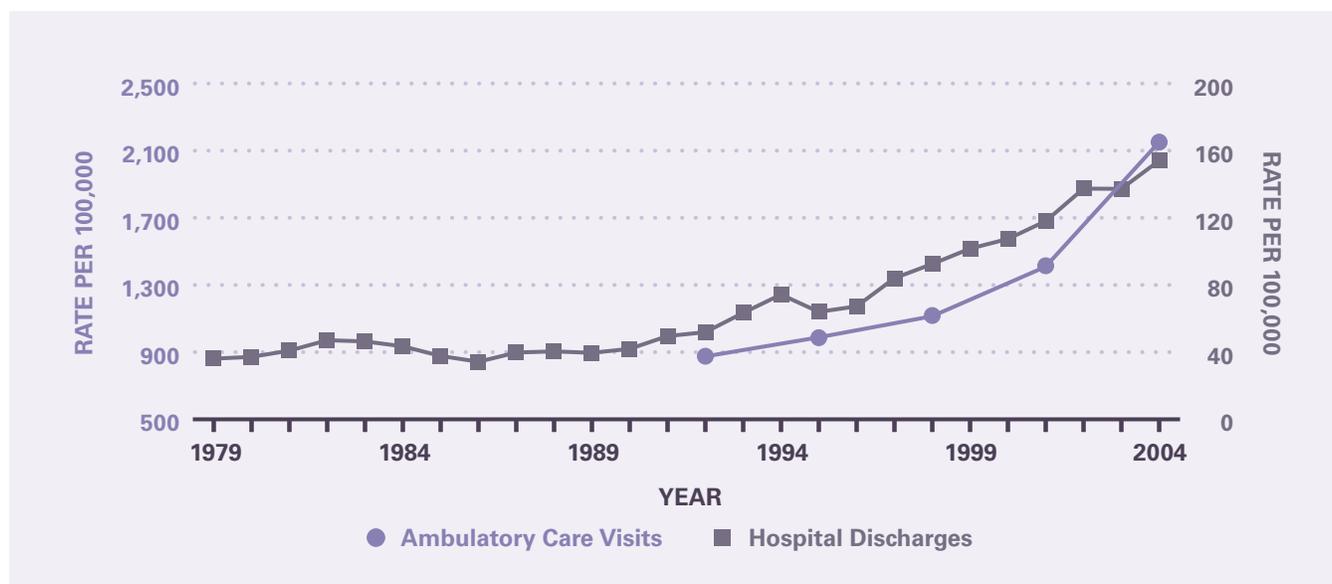
² Sandler RS. Irritable bowel syndrome. In: Everhart JE, editor. *Digestive diseases in the United States: epidemiology and impact*. US Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases. Washington, DC: US Government Printing Office, 1994; NIH Publication No. 94-1447 pp. 595–612.

Table 1. Chronic Constipation: Number and Age-Adjusted Rates of Ambulatory Care Visits and Hospital Discharges With First-Listed and All-Listed Diagnoses by Age, Race, and Sex in the United States, 2004

DEMOGRAPHIC CHARACTERISTICS	AMBULATORY CARE VISITS				HOSPITAL DISCHARGES				
	First-Listed Diagnosis		All-Listed Diagnoses		First-Listed Diagnosis		All-Listed Diagnoses		
	Number in Thousands	Rate per 100,000	Number in Thousands	Rate per 100,000	Number in Thousands	Rate per 100,000	Number in Thousands	Rate per 100,000	
AGE (Years)	Under 15	1,175	1,933	2,127	3,497	5	8	32	53
	15–44	601	478	1,397	1,110	6	5	106	84
	45–64	492	696	1,112	1,572	8	11	164	231
	65+	880	2,423	1,671	4,599	18	50	399	1,097
RACE	White	2,582	1,064	5,057	2,100	28	11	534	209
	Black	430	1,011	990	2,620	5	15	98	322
SEX	Female	1,955	1,267	4,050	2,655	23	14	434	260
	Male	1,194	866	2,256	1,657	14	11	266	206
TOTAL		3,149	1,072	6,306	2,148	37	13	700	238

SOURCE: National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS) (3-year average, 2003–2005), and Healthcare Cost and Utilization Project Nationwide Inpatient Sample (HCUP NIS)

Figure 1. Chronic Constipation: Age-Adjusted Rates of Ambulatory Care Visits and Hospital Discharges With All-Listed Diagnoses in the United States, 1979–2004

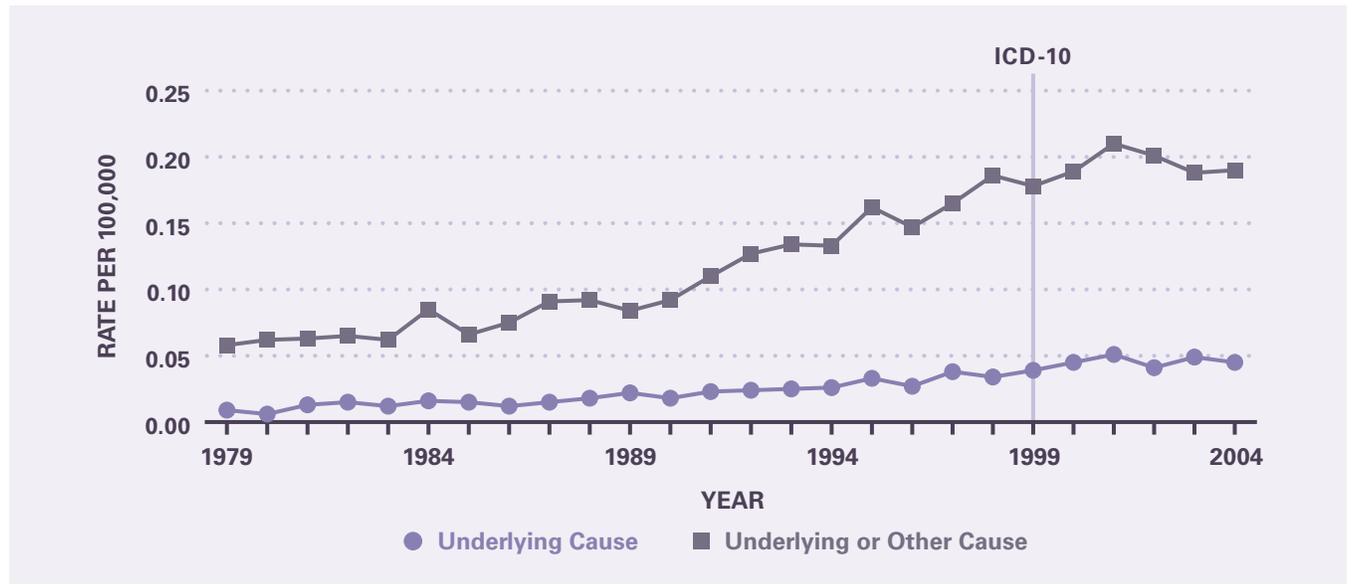


SOURCE: National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS) (averages 1992–1993, 1994–1996, 1997–1999, 2000–2002, 2003–2005), and National Hospital Discharge Survey (NHDS)

Table 2. Chronic Constipation: Number and Age-Adjusted Rates of Deaths and Years of Potential Life Lost (to Age 75) by Age, Race, and Sex in the United States, 2004

DEMOGRAPHIC CHARACTERISTICS	UNDERLYING CAUSE			UNDERLYING OR OTHER CAUSE		
	Number of Deaths	Rate per 100,000	Years of Potential Life Lost in Thousands	Number of Deaths	Rate per 100,000	
AGE (Years)	Under 15	3	0.0	0.2	6	0.0
	15–44	11	0.0	0.5	22	0.0
	45–64	10	0.0	0.2	54	0.1
	65+	113	0.3	0.1	500	1.4
RACE	White	129	0.0	0.8	527	0.2
	Black	7	0.0	0.1	48	0.2
SEX	Female	98	0.1	0.4	381	0.2
	Male	39	0.0	0.5	201	0.2
TOTAL		137	0.0	0.9	582	0.2

SOURCE: Vital Statistics of the United States

Figure 2. Chronic Constipation: Age-Adjusted Rates of Death in the United States, 1979–2004

SOURCE: Vital Statistics of the United States

Table 3. Chronic Constipation: Costliest Prescriptions

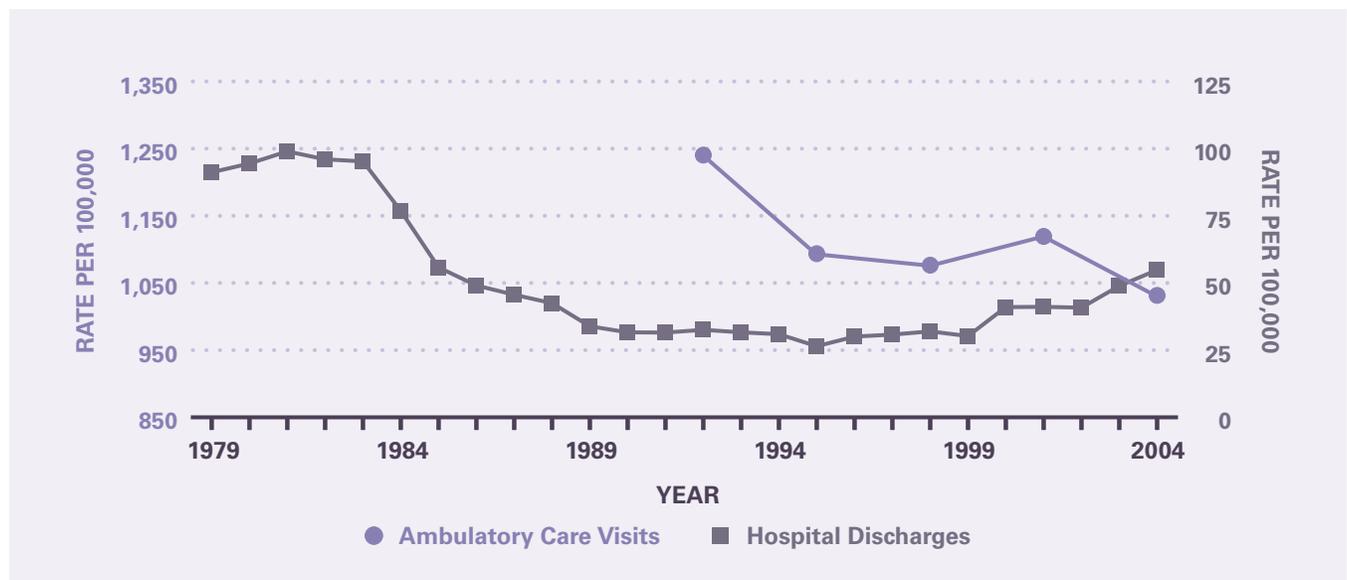
DRUG	Prescription (#)	Prescription	Retail Cost	Cost
Polyethylene Glycol 3350	2,462,873	46.0%	\$78,006,220	43.8%
Tegaserod	487,989	9.1	62,696,997	35.2
Lactulose	1,234,865	23.1	29,190,969	16.4
Docusate®	1,087,397	20.3	7,481,476	4.2
Methylcellulose	13,221	0.2	219,099	0.1
Magnesium Hydroxide	40,991	0.8	176,097	0.1
Psyllium	10,634	0.2	172,225	0.1
Senna®	4,085	0.1	139,618	0.1
Bisacodyl	10,271	0.2	57,569	0.0
Malt Extract	535	0.0	37,774	0.0
Other	3,432	0.0	66,635	0.0
TOTAL	5,356,293	100.0%	\$178,244,679	100.0%

SOURCE: Verispan

Table 4. Irritable Bowel Syndrome: Number and Age-Adjusted Rates of Ambulatory Care Visits and Hospital Discharges With First-Listed and All-Listed Diagnoses by Age, Race, and Sex in the United States, 2004

DEMOGRAPHIC CHARACTERISTICS	AMBULATORY CARE VISITS				HOSPITAL DISCHARGES				
	First-Listed Diagnosis		All-Listed Diagnoses		First-Listed Diagnosis		All-Listed Diagnoses		
	Number in Thousands	Rate per 100,000	Number in Thousands	Rate per 100,000	Number in Thousands	Rate per 100,000	Number in Thousands	Rate per 100,000	
AGE (Years)	Under 15	—	—	—	—	0	1	1	2
	15–44	724	575	1,169	929	8	6	61	48
	45–64	363	514	979	1,384	5	7	73	103
	65+	469	1,290	792	2,179	4	11	77	213
RACE	White	1,459	593	2,803	1,138	15	6	180	72
	Black	—	—	212	534	1	4	12	36
SEX	Female	1,322	867	2,531	1,649	14	9	177	112
	Male	283	201	523	373	4	2	35	26
TOTAL		1,605	547	3,054	1,040	18	6	212	72

SOURCE: National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS) (3-year average, 2003–2005), and Healthcare Cost and Utilization Project Nationwide Inpatient Sample (HCUP NIS)

Figure 3. Irritable Bowel Syndrome: Age-Adjusted Rates of Ambulatory Care Visits and Hospital Discharges With All-Listed Diagnoses in the United States, 1979–2004

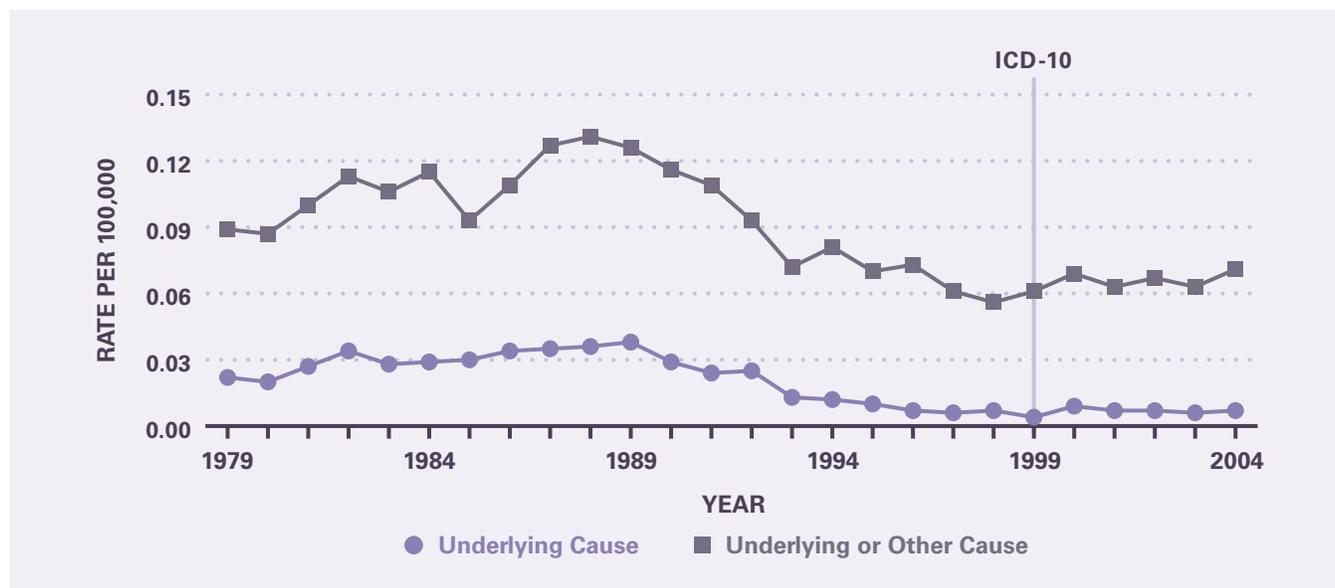
SOURCE: National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS) (averages 1992–1993, 1994–1996, 1997–1999, 2000–2002, 2003–2005), and National Hospital Discharge Survey (NHDS)

Table 5. Irritable Bowel Syndrome: Number and Age-Adjusted Rates of Deaths and Years of Potential Life Lost (to Age 75) by Age, Race, and Sex in the United States, 2004

DEMOGRAPHIC CHARACTERISTICS	UNDERLYING CAUSE			UNDERLYING OR OTHER CAUSE	
	Number of Deaths	Rate per 100,000	Years of Potential Life Lost in Thousands	Number of Deaths	Rate per 100,000
AGE (Years)	Under 15	—	—	—	—
	15–44	—	—	7	0.0
	45–64	1	0.0	21	0.0
	65+	19	0.1	188	0.5
RACE	White	19	0.0	210	0.1
	Black	1	0.0	5	0.0
SEX	Female	16	0.0	164	0.1
	Male	4	0.0	52	0.0
TOTAL	20	0.0	0.0	216	0.1

SOURCE: Vital Statistics of the United States

Figure 4. Irritable Bowel Syndrome: Age-Adjusted Rates of Death in the United States, 1979–2004



SOURCE: Vital Statistics of the United States

Table 6. Irritable Bowel Syndrome: Costliest Prescriptions

DRUG	Prescription (#)	Prescription	Retail Cost	Cost
Tegaserod	1,101,880	18.6%	\$171,155,138	58.1%
Hyoscyamine	1,574,929	26.5	34,810,797	11.8
Dicyclomine	1,317,179	22.2	20,669,937	7.0
Glycopyrrolate	222,748	3.8	19,877,577	6.7
Clidinium/Chlordiazepoxide	731,965	12.3	11,525,984	3.9
Diphenoxylate	372,133	6.3	7,711,178	2.6
Pantoprazole	45,496	0.8	7,384,419	2.5
Omeprazole	76,680	1.3	5,384,300	1.8
Esomeprazole	38,526	0.6	4,546,806	1.5
Methscopolamine	70,911	1.2	4,393,505	1.5
Other	383,137	6.3	7,201,054	2.4
TOTAL	5,935,584	100.0%	\$294,660,695	100.0%

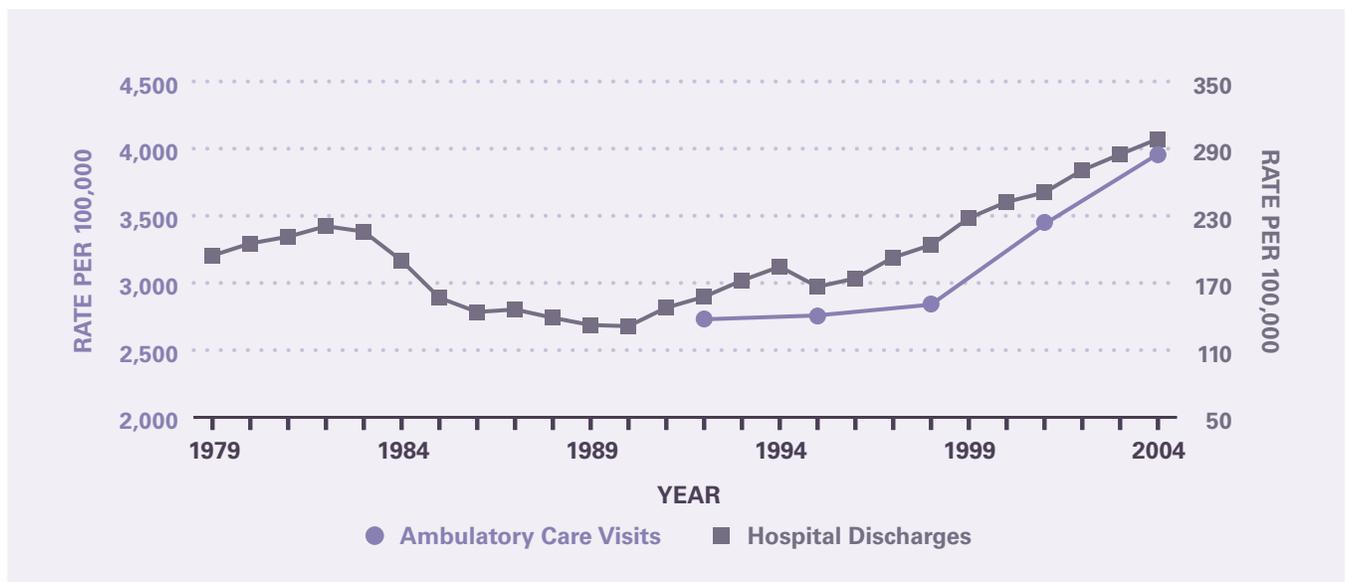
SOURCE: Verispan

Table 7. All Functional Intestinal Disorders: Number and Age-Adjusted Rates of Ambulatory Care Visits and Hospital Discharges With First-Listed and All-Listed Diagnoses by Age, Race, and Sex in the United States, 2004

DEMOGRAPHIC CHARACTERISTICS	AMBULATORY CARE VISITS				HOSPITAL DISCHARGES				
	First-Listed Diagnosis		All-Listed Diagnoses		First-Listed Diagnosis		All-Listed Diagnoses		
	Number in Thousands	Rate per 100,000	Number in Thousands	Rate per 100,000	Number in Thousands	Rate per 100,000	Number in Thousands	Rate per 100,000	
AGE (Years)	Under 15	1,347	2,215	2,384	3,921	10	17	48	79
	15–44	1,710	1,359	3,256	2,588	29	23	248	197
	45–64	1,127	1,594	2,700	3,820	30	42	341	483
	65+	1,762	4,851	3,308	9,104	45	124	603	1,660
RACE	White	5,039	2,057	9,690	3,980	86	35	944	373
	Black	633	1,513	1,391	3,702	16	54	169	546
SEX	Female	3,886	2,518	7,778	5,074	76	47	808	496
	Male	2,059	1,484	3,871	2,815	39	29	432	328
TOTAL		5,945	2,025	11,648	3,967	115	39	1,241	423

SOURCE: National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS) (3-year average, 2003–2005), and Healthcare Cost and Utilization Project Nationwide Inpatient Sample (HCUP NIS)

Figure 5. All Functional Intestinal Disorders: Age-Adjusted Rates of Ambulatory Care Visits and Hospital Discharges With All-Listed Diagnoses in the United States, 1979–2004

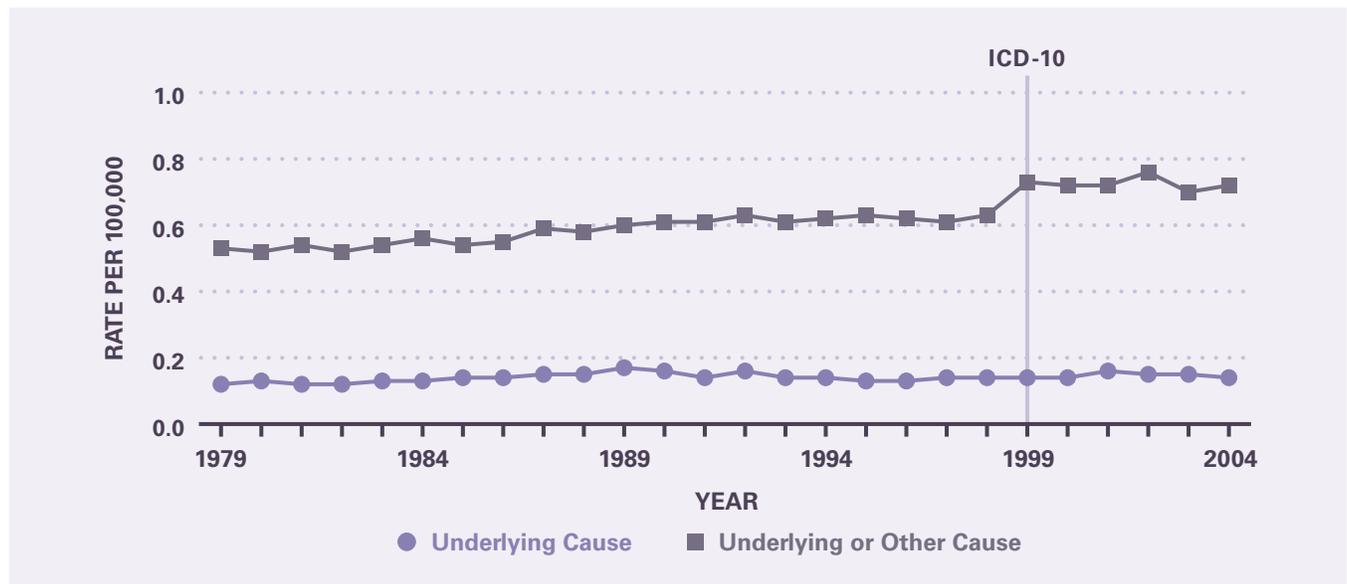


SOURCE: National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS) (averages 1992–1993, 1994–1996, 1997–1999, 2000–2002, 2003–2005), and National Hospital Discharge Survey (NHDS)

Table 8. All Functional Intestinal Disorders: Number and Age-Adjusted Rates of Deaths and Years of Potential Life Lost (to Age 75) by Age, Race, and Sex in the United States, 2004

DEMOGRAPHIC CHARACTERISTICS		UNDERLYING CAUSE			UNDERLYING OR OTHER CAUSE	
		Number of Deaths	Rate per 100,000	Years of Potential Life Lost in Thousands	Number of Deaths	Rate per 100,000
AGE (Years)	Under 15	6	0.0	0.4	27	0.0
	15–44	21	0.0	0.9	106	0.1
	45–64	49	0.1	0.9	335	0.5
	65+	347	1.0	0.2	1,721	4.7
RACE	White	381	0.1	1.9	1,941	0.7
	Black	36	0.1	0.5	214	0.8
SEX	Female	266	0.1	0.9	1,297	0.7
	Male	157	0.1	1.6	892	0.7
TOTAL		423	0.1	2.5	2,189	0.7

SOURCE: Vital Statistics of the United States

Figure 6. All Functional Intestinal Disorders: Age-Adjusted Rates of Death in the United States, 1979–2004

SOURCE: Vital Statistics of the United States

Table 9. All Functional Intestinal Disorders: Costliest Prescriptions

DRUG	Prescription (#)	Prescription	Retail Cost	Cost
Tegaserod	1,618,699	11.6%	\$238,030,688	32.0%
Lansoprazole	695,616	5.0	85,935,464	11.6
Polyethylene glycol 3350	2,647,099	19.0	84,291,600	11.3
Esomeprazole	395,269	2.8	64,101,386	8.6
Pantoprazole	592,957	4.3	60,350,131	8.1
Hyoscyamine	1,787,325	12.8	40,443,459	5.4
Lactulose	1,278,184	9.2	30,168,691	4.1
Rabeprazole	303,450	2.2	29,843,464	4.0
Omeprazole	238,881	1.7	23,755,697	3.2
Glycopyrrolate	242,494	1.7	20,706,229	2.8
Other	4,114,833	29.6	65,854,357	8.9
TOTAL	13,914,807	100.0%	\$743,481,166	100.0%

SOURCE: Verispan

