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Physician Office Visits at Which Benzodiazepines Were Prescribed: Findings From 2014–2016 National Ambulatory Medical Care Survey

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Abstract

Objective—This report describes characteristics of visits to office-based physicians at which benzodiazepines were prescribed, including visits where opioids were coprescribed.

Methods—Data from the 2014–2016 National Ambulatory Medical Care Survey were used. Population-based visit rates were examined by select patient characteristics. Visit characteristics are also presented.

Results—During 2014–2016, the rate of visits at which benzodiazepines were prescribed was 27 annual visits per 100 adults. Among visits at which benzodiazepines were prescribed, approximately one-third involved an overlapping opioid prescription for a rate of 10 annual visits per 100 adults. Both visit rates were higher for women than men and increased with age. The percentage of visits with a new prescription for a benzodiazepine or a new prescription for both a benzodiazepine and an opioid was lower than the percentage of visits with continued prescriptions. A problem related to a chronic condition was the most common reason for visits at which benzodiazepines were prescribed, as well as for visits at which benzodiazepines were coprescribed with opioids. Mental disorders were the most frequent primary diagnosis category for visits at which benzodiazepines were prescribed, whereas diseases of the musculoskeletal system and connective tissue was the most frequent primary diagnosis category for visits at which benzodiazepines were coprescribed with opioids.

Keywords: ambulatory health care • office-based physician care • coprescription • NAMCS

Introduction

Benzodiazepines are a class of central nervous system depressant drugs approved for several conditions, including anxiety, insomnia, seizure, and acute alcohol withdrawal (1,2). Prolonged use of benzodiazepines has been associated with tolerance (the need for higher and more frequent doses to obtain the same effect [3]), withdrawal symptoms, misuse, and use disorder (1). In older adults, benzodiazepines have been shown to increase the risk of falls, hip fractures, cognitive impairment, and drug-associated hospital admissions (4). Despite concerns related to the long-term use of benzodiazepines, the percentage of U.S. adults with a prescription for a benzodiazepine increased from 4.1% in 1996 to 5.6% in 2013 (5). The number of ambulatory visits with one or more prescriptions for a benzodiazepine increased from 27.6 million in 2003 to 62.6 million in 2015 (6). Overdose deaths involving benzodiazepines increased from 0.58 per 100,000 adults in 1996 to 3.07 in 2010 (5). Data from the National Institute on Drug Abuse show that 11,537 overdose deaths involving benzodiazepines occurred in 2017. Approximately 85% of the 2017 overdose deaths involving benzodiazepines also involved an opioid (7). Coprescribing benzodiazepines with opioids is not recommended due to the increased risk of respiratory depression (8,9).

Despite the risk associated with the combined use of benzodiazepines and opioids, a recent trend analysis using data from the National Ambulatory Medical Care Survey (NAMCS) showed that coprescription of benzodiazepines and opioids increased from 0.5% of physician office visits in 2003 to 2.0% in 2015, and in 2015, opioids were prescribed at 26.4% of visits at which there was also a benzodiazepine prescription (6). In 2016, the U.S. Food and Drug Administration

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
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issued warnings on the use of opioid analgesics or opioid-containing cough products by those taking prescription benzodiazepines, informing the public about the risks associated with concurrent use of these drugs (10).

This report examines recent rates of visits to physician offices at which benzodiazepines were prescribed, as well as visit rates in which benzodiazepines were prescribed together with opioids. Rates were analyzed by patient and visit characteristics, including sex, insurance status, type of provider seen, major reason for visit, number of past visits, prescription status (new or continued), and primary diagnosis. Results were stratified by age.

Methods

Data for this report are from NAMCS, which is conducted by the National Center for Health Statistics. NAMCS is an annual, nationally representative survey of office-based physicians and visits to their practices. NAMCS uses a stratified two-stage probability sampling design, with physicians selected at the first stage and visits selected at the second stage. The survey data are weighted to produce national estimates of office visits. Detailed information on the methodology of NAMCS is available elsewhere (11–13). Data were collected from 45,710 office visits in 2014, 28,332 office visits in 2015, and 13,165 office visits in 2016. The response rate varied by year: 39.0% in 2014, 29.6% in 2015, and 32.7% in 2016.

The two groups included in this analysis are: a) visits to office-based physicians with documentation in the patients' medical record of a benzodiazepine provided at the time of the visit or prescribed, although other drugs, including opioids, may also have been prescribed at these visits; and b) a subset of all visits with documentation of benzodiazepine prescription where opioids were also provided or prescribed, although other drugs may have been prescribed at these visits as well.

During 2014–2016, adult patients aged 18 and over made a total of 73,568 (unweighted) visits. Of these, 6,394 visits had a benzodiazepine prescription, either with or without other accompanying prescriptions. Among visits by adult patients with a benzodiazepine prescription, 2,231 visits also involved an opioid prescription.

Population-based rates (visits per 100 adults) were calculated using population estimates from the U.S. Census Bureau.

Data analyses were performed using the statistical packages SAS version 9.4 (SAS Institute, Cary, N.C.) and SAS-callable SUDAAN version 11.0 (RTI International, Research Triangle Park, N.C.). Differences between groups were evaluated using linear trends or a two-tailed *t* test when no linear trends were found ($p < 0.05$). Statistically significant differences and trends are indicated in the figures and discussed in the Results section. NAMCS collects data on medications that are provided or prescribed during a patient visit, but it does not measure whether the patient actually took the medication; consequently, medication adherence is not examined in this report.

The results are divided into three main sections. The first section focuses on patient characteristics, the second section focuses on visit characteristics, and the last section examines the most frequent primary diagnoses.

Results

Patient characteristics of visits at which benzodiazepines were prescribed

Annually during 2014–2016, benzodiazepines were prescribed at approximately 65.9 million office-based physician visits.

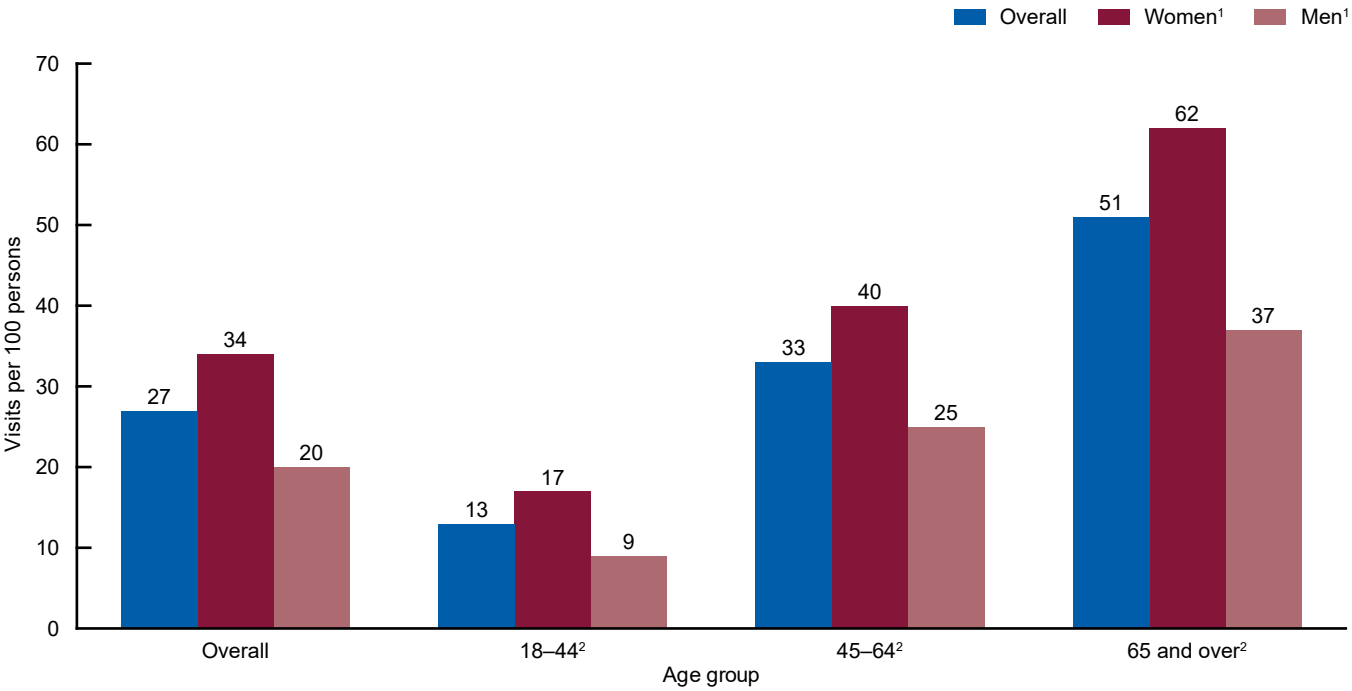
Figure 1 shows physician office visit rates at which benzodiazepines were prescribed.

- During 2014–2016, the physician office visit rate at which benzodiazepines were prescribed was 27 annual visits per 100 adults.
- The rates of physician office visits at which benzodiazepines were prescribed were higher for women (34 visits per 100 women) than men (20 visits per 100 men). This pattern was found across all age groups.
- The rates of physician office visits at which benzodiazepines were prescribed increased with age: 13 visits per 100 adults aged 18–44, 33 visits per 100 adults aged 45–64, and 51 visits per 100 adults aged 65 and over.
- The visit rate at which benzodiazepines were prescribed was highest for women aged 65 and over at 62 visits per 100 women, and lowest for men aged 18–44 at 9 visits per 100 men.

Patient characteristics of visits at which benzodiazepines were prescribed with opioids

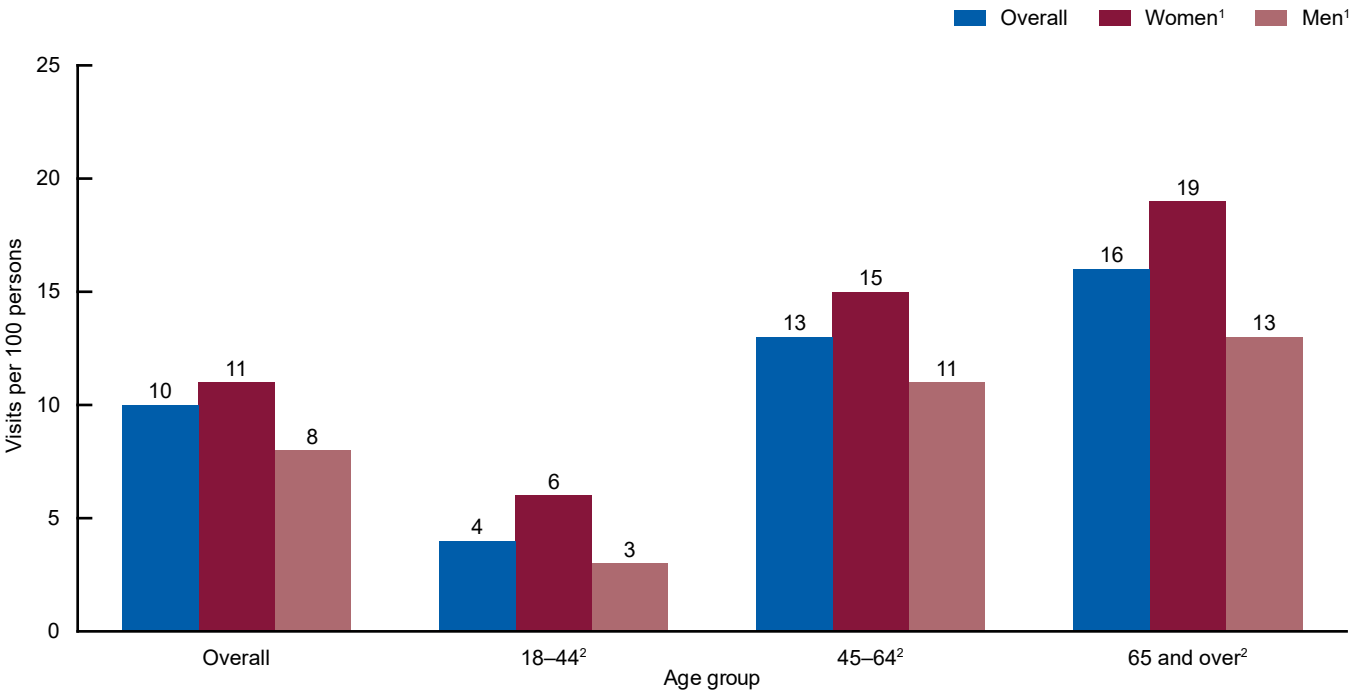
Figure 2 shows physician office visits at which benzodiazepines were prescribed with opioids.

- During 2014–2016, the physician office visit rate at which benzodiazepines were prescribed with opioids was 10 visits per 100 adults.
- Overall, visit rates were higher for women (11 visits per 100 women) than men (8 visits per 100 men).
- Visit rates were higher for women than men among adults aged 18–44 (6 visits per 100 women and 3 visits per 100 men) and among adults aged 65 and over (19 visits per 100 women and 13 visits per 100 men). The observed difference between men and women aged 45–64 was not significant.
- Visit rates increased with age: 4 visits per 100 adults aged 18–44, 13 visits per 100 adults aged 45–64, and 16 visits per 100 adults aged 65 and over.
- The highest visit rate was for women aged 65 and over at 19 visits per 100 women, and the lowest visit rate was for men aged 18–44 at 3 visits per 100 men.



[1]Significant difference in estimates between women and men overall and among all age groups.
[2]Significant linear trend across all age groups.
NOTE: Visit rates are based on the set of estimates of the U.S. civilian noninstitutional population developed by the U.S. Census Bureau, Population Division.
SOURCE: NCHS, National Ambulatory Medical Care Survey, 2014–2016.

Figure 1. Visit rates at which benzodiazepines were prescribed for adult patients aged 18 and over, by age and sex: United States, 2014–2016



[1]Significant difference in estimates between women and men overall and among age groups 18–44 and 65 and over.
[2]Significant linear trend across all age groups.
NOTE: Visit rates are based on the set of estimates of the U.S. civilian noninstitutional population developed by the U.S. Census Bureau, Population Division.
SOURCE: NCHS, National Ambulatory Medical Care Survey, 2014–2016.

Figure 2. Visit rates at which benzodiazepines were prescribed with opioids for adult patients aged 18 and over, by age and sex: United States, 2014–2016

Characteristics of visits at which benzodiazepines were prescribed

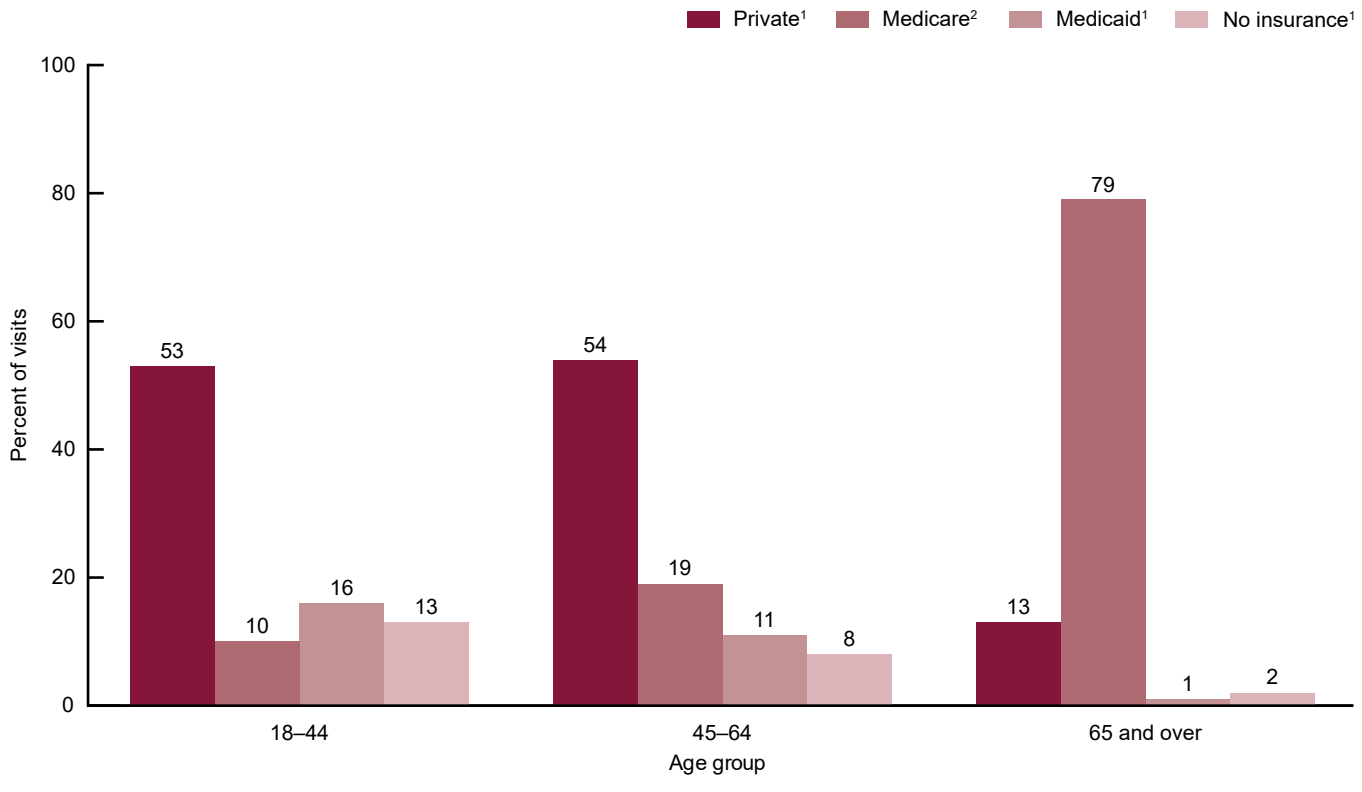
Table 1 shows the percentage of visits at which benzodiazepines were prescribed by selected characteristics.

- During 2014–2016, approximately one-half of visits at which benzodiazepines were prescribed were with a primary care provider (48%), and one-half were with a different type of provider (50%). Among primary care providers, general or family practice (54%) and internal medicine (39%) were the most frequent specialties for visits at which benzodiazepines were prescribed. Among nonprimary care providers, visits to psychiatrists accounted for 28% of visits where benzodiazepines were prescribed.
- A problem related to a chronic condition was the most frequent reason for visits where benzodiazepines were prescribed (59%), followed by a new problem (23%). Preventive visits accounted for 12% of the visits, and pre- or postsurgery accounted for 5% of such visits.
- Visits at which benzodiazepines were prescribed were made by patients who frequently visited the doctor: 40% were made by patients going to the same physician six or more times in the past 12 months.
- Private insurance (39%) and Medicare (38%) were the primary expected sources of payment for all office-based physician visits at which benzodiazepines were prescribed, followed by Medicaid (9%) and no insurance (7%).
- At 11% of visits at which benzodiazepines were prescribed, benzodiazepine was a new prescription.

Primary source of payment for visits where benzodiazepines were prescribed, by age group

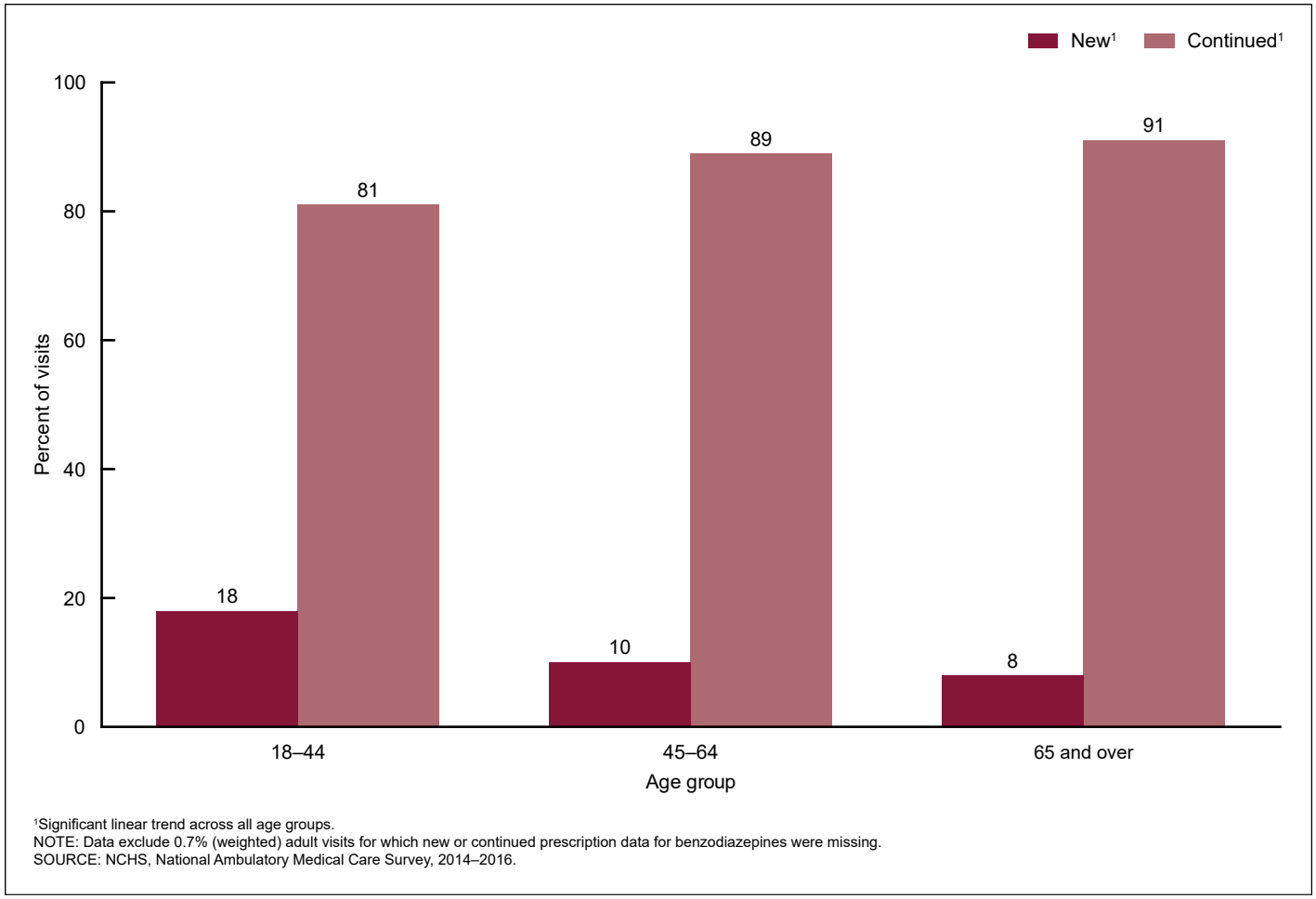
Figure 3 shows the primary expected source of payment, by age group, for visits at which benzodiazepines were prescribed.

- During 2014–2016, the use of private insurance as the primary source of payment decreased with age: From 53% of visits by adults aged 18–44 and 54% of visits for age group 45–64, the percentage of visits fell to 13% for age group 65 and over. Conversely, Medicare as the primary expected source of payment increased with age: 10% of visits by adults aged 18–44, 19% of visits for age group 45–64, and 79% of visits for age group 65 and over.
- Medicaid as the primary expected source of payment decreased with age: 16% of visits by adults aged 18–44, 11% of visits for age group



[1]Significant differences in estimates between age group 65 and over and all other age groups.
[2]Significant linear trend across all age groups.
NOTES: All sources of payment were combined into one mutually exclusive primary source of payment using the following hierarchy: Medicare; Medicaid or Children's Health Insurance Program or other state-based program; private insurance; and no insurance. No insurance is defined as having only self-pay, no charge, or charity as payment sources. Other sources of payment and missing or blank data are excluded and represent 6.35% (weighted) of adult visits at which benzodiazepines were prescribed.
SOURCE: NCHS, National Ambulatory Medical Care Survey, 2014–2016.

Figure 3. Primary expected source of payment for visits at which benzodiazepines were prescribed, by age: United States, 2014–2016



[1]Significant linear trend across all age groups.
NOTE: Data exclude 0.7% (weighted) adult visits for which new or continued prescription data for benzodiazepines were missing.
SOURCE: NCHS, National Ambulatory Medical Care Survey, 2014–2016.

Figure 4. Prescription status for visits at which benzodiazepines were prescribed, by age: United States, 2014–2016

45–64, and 1% of visits for age group 65 and over.
- No insurance as the primary expected source of payment decreased with age: 13% of visits by adults aged 18–44, 8% of visits for age group 45–64, and 2% of visits for age group 65 and over.

Prescription status for visits where benzodiazepines were prescribed, by age group

Figure 4 shows how frequently benzodiazepines were prescribed as new or continued prescriptions by age group.

- The percentage of visits with a new prescription for benzodiazepines was lower than the percentage of visits with a continued prescription across all age groups.
- The percentage of visits with a new prescription for benzodiazepines decreased with age: 18% among visits by adults aged 18–44, 10% among visits for age group 45–64, and 8% among visits for age group 65 and over. By contrast, the percentage of visits with a continued prescription for benzodiazepines increased with age: 81% among visits by adults aged 18–44, 89% among visits for age group 45–64, and 91% among visits for age group 65 and over.

Characteristics of visits at which benzodiazepines were prescribed with opioids

Annually during 2014–2016, benzodiazepines and opioids were prescribed at approximately 23 million physician office visits (Table 2), accounting for 35% of the visits at which benzodiazepines were prescribed. Table 2 describes visits at which benzodiazepines were prescribed with opioids by selected visit characteristics.

- During 2014–2016, 56% of visits at which benzodiazepines were prescribed with opioids occurred with a primary care provider, which was higher than visits with a nonprimary care provider (42%). Among primary care providers, general or family practice (55%) and internal medicine (40%) were the most frequent specialties for visits at which benzodiazepines were prescribed with opioids. Among nonprimary care providers, visits to orthopedic surgeons accounted for 13% of visits at which benzodiazepines were prescribed with opioids, and general or family practice accounted for 6% of such visits, followed by other specialties for the remaining visits (81% total).
- A problem related to a chronic condition was the most frequent reason for visits at which benzodiazepines were prescribed with opioids (57%), followed by

a new problem (23%). Preventive visits accounted for 11% of visits, and pre- or postsurgery visits accounted for 7% of visits.
- Of the visits at which benzodiazepines were prescribed with opioids, 46% were made by patients going to the same physician six or more times in the past 12 months.
- Medicare (39%) and private insurance (36%) were the primary expected sources of payment for all visits at which benzodiazepines were prescribed with opioids, followed by Medicaid (11%) and no insurance (6%).
- At 7% of visits where benzodiazepines and opioids were prescribed together, both drugs were new prescriptions.

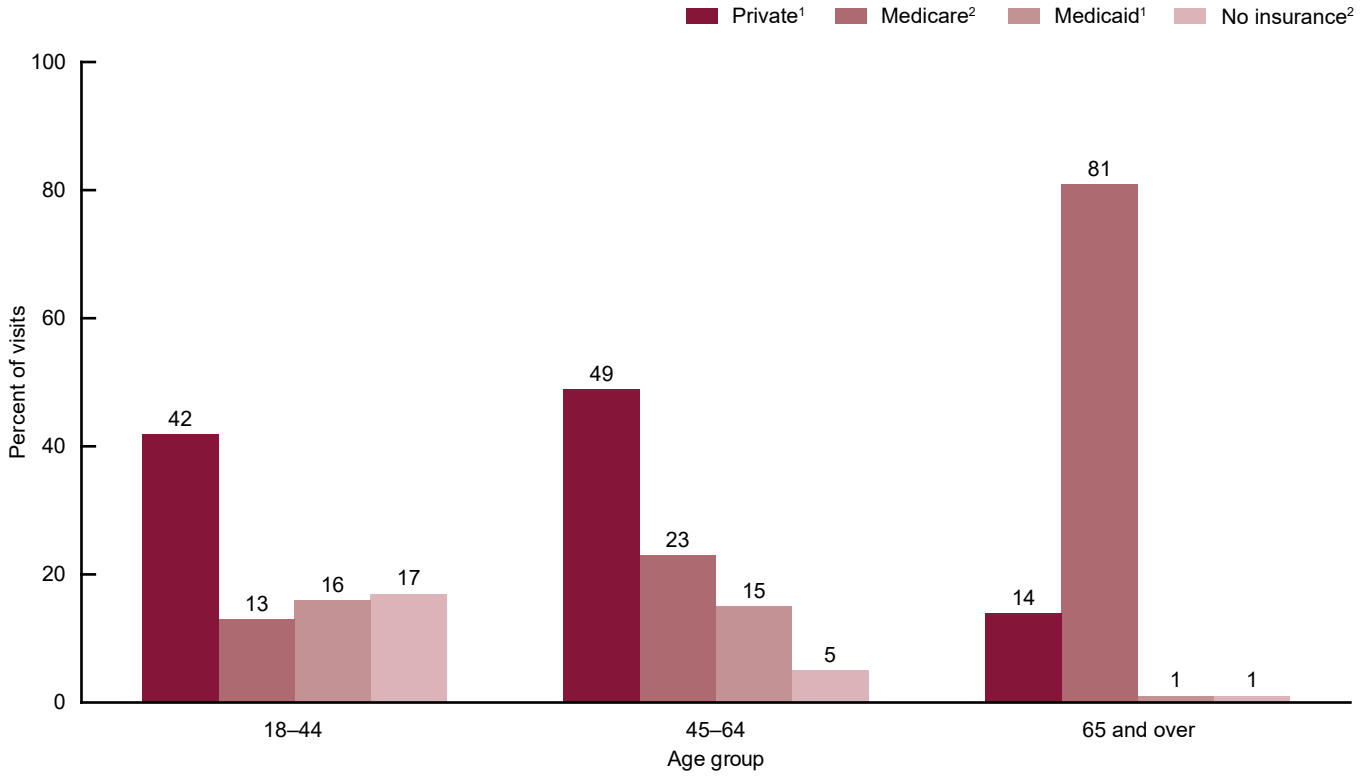
Primary source of payment for visits where benzodiazepines were prescribed with opioids, by age group

Figure 5 shows the primary expected source of payment, by age group, for visits at which benzodiazepines were prescribed with opioids.

- During 2014–2016, the use of private insurance as the primary expected source of payment for visits where benzodiazepines were prescribed with opioids was higher for visits by adults aged 45–64 (49%) and 18–44 (42%) than for visits by adults aged 65 and over (14%), whereas Medicare as the primary expected source of payment increased with age: 13% of visits by adults aged 18–44, 23% of visits for age group 45–64, and 81% of visits for age group 65 and over.
- Medicaid as the primary expected source of payment decreased with age, accounting for 16% of visits by adults aged 18–44, 15% of visits for age group 45–64, and 1% of visits for age group 65 and over.
- The percentage of visits with no insurance as the primary expected source of payment decreased with age: 17% of visits by adults aged 18–44, 5% of visits for age group 45–64, and 1% of visits for age group 65 and over.

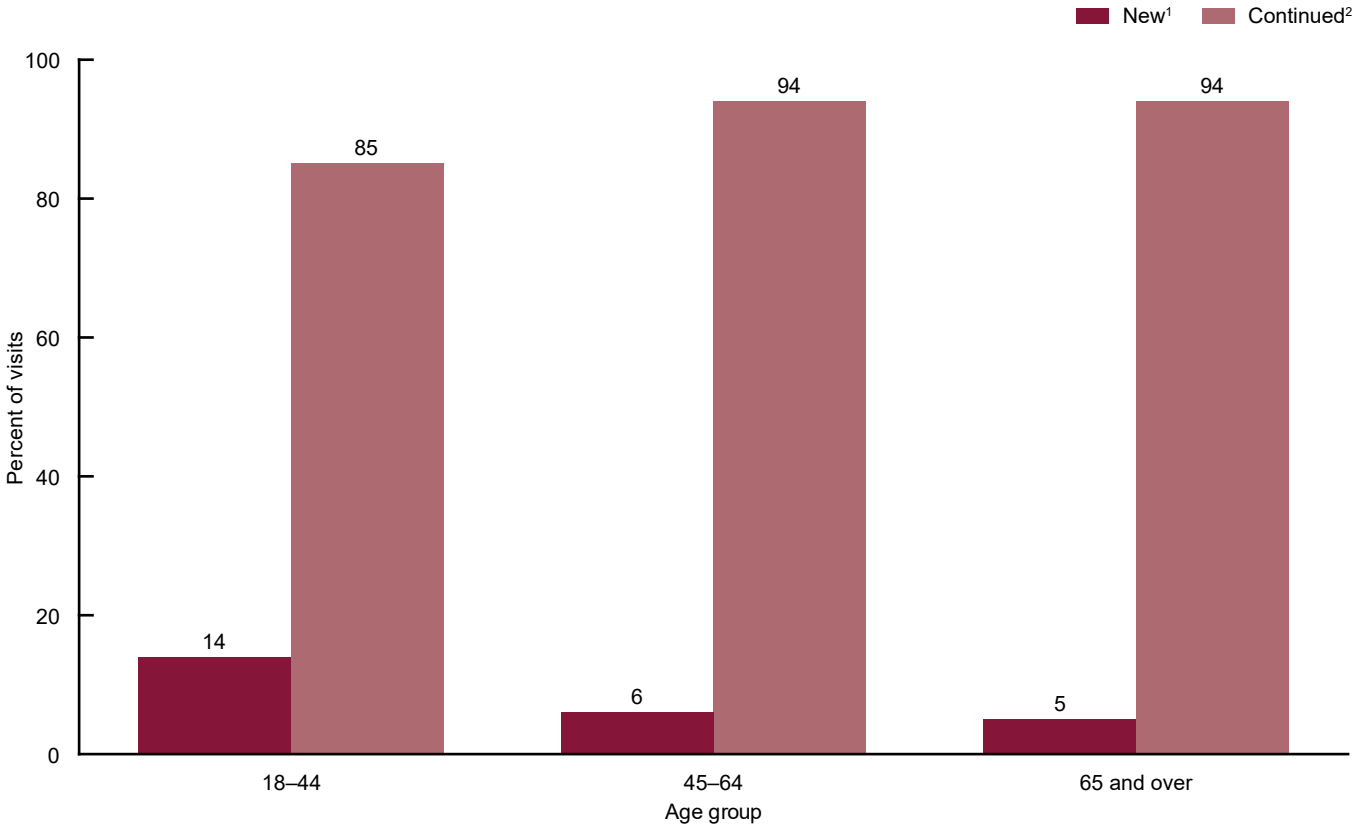
Prescription status for visits where benzodiazepines were prescribed with opioids, by age group

Figure 6 shows how frequently benzodiazepine and opioid prescriptions were prescribed together as new or continued prescriptions by age group.



[1]Significant differences in estimates between age group 65 and over and all other age groups.
[2]Significant linear trend across all age groups.
NOTES: All sources of payment were combined into one mutually exclusive primary source of payment using the following hierarchy: Medicare; Medicaid or Children's Health Insurance Program or other state-based program; private insurance; and no insurance. No insurance is defined as having only self-pay, no charge, or charity as payment sources. Other sources of payment and missing or blank data are excluded and represent 7.51% (weighted) of adult visits at which benzodiazepines were prescribed with opioids.
SOURCE: NCHS, National Ambulatory Medical Care Survey, 2014–2016.

Figure 5. Primary expected source of payment for visits at which benzodiazepines were prescribed with opioids, by age: United States, 2014–2016



[1]Significant differences in estimates between age groups 18–44 and 65 and over.
[2]Significant linear trend across all age groups.
NOTE: Data exclude 0.5% (weighted) adult visits for which new or continued prescription data for benzodiazepines or opioids were missing.
SOURCE: NCHS, National Ambulatory Medical Care Survey, 2014–2016.

Figure 6. Prescription status for visits at which benzodiazepines and opioids were prescribed, by age: United States, 2014–2016

- During 2014–2016, the percentage of visits having new prescriptions for a benzodiazepine and an opioid was lower than the percentage of visits with continued prescriptions for both across all age groups.
- The percentage of visits with new prescriptions for a benzodiazepine and an opioid decreased with age: 14% of visits by adults aged 18–44, 6% of visits for age group 45–64, and 5% of visits for age group 65 and over. Conversely, the percentage of visits with continued prescriptions for a benzodiazepine and an opioid increased with age: 85% of visits by adults aged 18–44 and 94% each among visits by adults aged 45–64 and 65 and over.

Primary diagnoses at visits in which benzodiazepines were prescribed

Table 3 shows the frequency of primary diagnoses at visits where benzodiazepines were prescribed, classified by major disease category.

- Overall, mental disorders constituted the most common primary diagnosis category for visits where benzodiazepines were prescribed, accounting for 22% of visits. Of these, episodic mood disorder (40%) and anxiety (34%) accounted for the majority. Diseases of the musculoskeletal system and connective tissue (mainly represented by spinal disorder) and diseases of the circulatory system (mainly represented by hypertension and heart disease) each accounted for 11% of visits where benzodiazepines were prescribed. These percentages were higher than the 7% each of visits where the primary diagnosis category was endocrine, nutritional and metabolic disorders (mainly represented by diabetes and hyperlipidemia) and diseases of the nervous system (mainly represented by acute and chronic pain).
- Mental disorders accounted for the most common diagnosis category among adults aged 18–44 and 45–64 and decreased with age: 37% for adults aged 18–44, 24% for those aged 45–64, and 11% for those aged 65 and over. Diseases of the circulatory system was the most common primary diagnosis category for visits by adults aged 65 and over (19%).

Primary diagnoses at visits in which benzodiazepines were prescribed with opioids

Table 4 shows the frequency of primary diagnoses at visits where benzodiazepines were prescribed with opioids, classified by major disease category.

- Overall, the most common primary diagnosis category for visits in which benzodiazepines were prescribed with opioids was diseases of the musculoskeletal system and connective tissue (22%), with spinal disorder accounting for 54% of the visits within this diagnosis category. Diseases of the circulatory system (mainly represented by hypertension and heart disease) accounted for 10% of visits in which benzodiazepines were prescribed with opioids, not significantly different from mental disorders and diseases of the nervous system, which accounted for 8% each of visits.
- Diseases of the musculoskeletal system and connective tissue was the most common primary diagnosis category among all age groups, representing 20% of visits by adults aged 18–44, 28% of visits for age group 45–64, and 15% of visits for age group 65 and over.
- Other common primary diagnosis categories for visits by adults aged 18–44 included ill-defined conditions, accounting for 13% of the visits at which benzodiazepines were prescribed with opioids.
- Among visits by adults aged 65 and over, diseases of the circulatory system was a common primary diagnosis category, accounting for 21% of visits in which benzodiazepines were prescribed with opioids.

Discussion

During 2014–2016, an estimated annual average of 65.9 million office-based physician visits at which benzodiazepines were prescribed were made by adults in the United States. This corresponded to a rate of 27 annual visits per 100 adults. Visit rates were higher for women than men and increased with advancing age. One-half of the visits by adults aged 18–44 and 45–64 in which benzodiazepines were prescribed (53% and 54%, respectively) used private insurance as the primary expected source of payment, whereas 79% of the visits by adults aged 65 and over used Medicare as the primary expected source of payment. At 88% of visits in which benzodiazepines were prescribed, benzodiazepine was a continued prescription. Mental disorders was the most common primary diagnosis category for visits at which benzodiazepines were prescribed.

At more than one-third of visits where benzodiazepines were prescribed (35%), an opioid coprescription was also identified, corresponding to a rate of 10 annual visits per 100 adults. Similar to visits at which benzodiazepines were prescribed, rates of visits at which benzodiazepines were prescribed with opioids were higher for women than men and increased with advancing age. For visits at which benzodiazepines were prescribed with opioids, almost one-half made by adults aged 18–44 and 45–64 (42% and 49%, respectively) had private insurance as the primary expected source of payment, whereas 81% of such visits by adults aged 65 and over had Medicare as the primary expected source of payment. At 92% of the visits at which benzodiazepines were prescribed with opioids, a benzodiazepine or an opioid was a continued prescription. Diseases of the musculoskeletal system and connective tissue was the most common primary diagnosis category for visits at which benzodiazepines were prescribed with opioids, which differed from visits at which only benzodiazepines were prescribed. Analysis of office-based physician visits may help monitor benzodiazepine prescriptions and coprescriptions of benzodiazepines and opioids.

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Table 1. Characteristics of visits at which benzodiazepines were prescribed for adult patients aged 18 and over: United States, 2014–2016

Characteristic	Annual average number of visits (thousands)	Percent (95% confidence interval)
Total visits	65,946	100 …
Primary care provider[1]		
Yes[1]	31,429	48 (43–52)
Specialty:		
General or family practice	17,036	54 (46–62)
Internal medicine	12,170	39 (31–47)
Other	2,287	7 (5–11)
No[1]	33,167	50 (46–55)
Specialty:		
Psychiatry	9,321	28 (23–34)
Cardiovascular diseases	2,559	8 (6–10)
Other	21,288	64 (58–70)
Major reason for visit[2]		
New problem	15,086	23 (21–25)
Chronic problem	38,593	59 (55–62)
Pre- or postsurgery	3,244	5 (4–6)
Preventive	8,025	12 (10–15)
Number of visits in past 12 months[3]		
New patient	6,756	10 (9–12)
1	3,091	5 (4–6)
2	7,689	12 (10–13)
3	9,240	14 (12–16)
4	6,585	10 (9–12)
5	6,346	10 (8–11)
6 or more	26,239	40 (36–43)
Primary expected source of payment[4]		
Private insurance	25,886	39 (37–42)
Medicare	25,343	38 (35–42)
Medicaid	5,790	9 (7–11)
No insurance	4,741	7 (5–10)
Prescription status[5]		
New	7,424	11 (9–14)
Continued	58,075	88 (85–90)

… Category not applicable.
[1]Blank and unknown data are excluded and represent 2.0% (weighted) of visits at which benzodiazepines were prescribed. Specialty subcategories are the percentages of visits within that category.
[2]Missing values are excluded and represent 1.5% (weighted) of adult visits at which benzodiazepines were prescribed.
[3]Includes current visit.
[4]All sources of payment were combined into one mutually exclusive primary source of payment using the following hierarchy: Medicare; Medicaid or Children's Health Insurance Program or other state-based program; private insurance; and no insurance. Total visits include all visits by patients of all ages. No insurance is defined as having only self-pay, no charge, or charity as payment sources. Other sources of payment and missing or blank data are excluded and represent 6.3% (weighted) of adult visits at which benzodiazepines were prescribed.
[5]Excludes 0.7% (weighted) adult visits at which new or continued prescription data for benzodiazepines were missing.

SOURCE: NCHS, National Ambulatory Medical Care Survey, 2014–2016.

Table 2. Characteristics of visits in which benzodiazepines were prescribed with opioids for adult patients aged 18 and over: United States, 2014–2016

Characteristic	Annual average number of visits (thousands)	Percent (95% confidence interval)
Total visits	23,210	100 …
Primary care provider[1]		
Yes[1]	12,992	56 (49–62)
Specialty:		
General or family practice	7,210	55 (44–66)
Internal medicine	5,204	40 (29–52)
Other	*578	* …
No[1]	9,784	42 (36–49)
Specialty:		
General or family practice	*584	6 (3–11)
Orthopedic surgery	1,271	13 (9–18)
Other	7,928	81 (75–86)
Major reason for visit[2]		
New problem	5,250	23 (20–26)
Chronic problem	13,148	57 (52–61)
Pre- or postsurgery	1,723	7 (6–10)
Preventive	2,664	11 (8–16)
Number of visits in past 12 months[3]		
New patient	2,722	12 (9–16)
1	933	4 (3–6)
2	2,614	11 (9–14)
3	2,541	11 (9–14)
4	1,926	8 (6–11)
5	1,891	8 (6–11)
6 or more	10,582	46 (39–52)
Primary expected source of payment[4]		
Private insurance	8,335	36 (32–40)
Medicare	9,160	39 (35–44)
Medicaid	2,523	11 (8–14)
No insurance	1,428	6 (4–9)
Prescription status[5]		
New	1,732	7 (4–12)
Continued	21,362	92 (87–95)

… Category not applicable.
* Estimate does not meet NCHS standards of reliability.
[1]Blank and unknown data are excluded and represent 2% (weighted) of visits at which benzodiazepines were prescribed with opioids. Specialty subcategories are the percentage of visits within that category.
[2]Missing values are not included and represent 1.8% (weighted) of adult visits at which benzodiazepines were prescribed with opioids.
[3]Includes current visit.
[4]All sources of payment were combined into one mutually exclusive primary source of payment using the following hierarchy: Medicare; Medicaid or Children's Health Insurance Program or other state-based program; private insurance; and no insurance. Total visits includes all visits by patients of all ages. No insurance is defined as having only self-pay, no charge, or charity as payment sources. Other sources of payment and missing or blank data are excluded and represent 7.5% (weighted) of adult visits at which benzodiazepines were prescribed with opioids.
[5]Excludes 0.5% (weighted) adult visits for which new or continued prescription data for benzodiazepines or opioids were missing.

SOURCE: NCHS, National Ambulatory Medical Care Survey, 2014–2016.

Table 3. Primary diagnoses at visits at which benzodiazepines were prescribed for adult patients aged 18 and over, by age group: United States, 2014–2016

Diagnosis category and age group	Annual average number of visits (thousands)	Percent (95% confidence interval)
Total visits	65,946	100 …
All age groups[1]		
Mental disorders	14,606	22 (19–25)
Episodic mood disorder[2]	5,023	40 (25–45)
Anxiety	5,828	34 (29–40)
Other	3,755	26 (22–30)
Diseases of the musculoskeletal system and connective tissue	7,428	11 (9–14)
Spinal disorder	3,596	48 (39–57)
Rheumatism, excluding back	1,172	16 (10–23)
Other	2,661	36 (29–43)
Diseases of the circulatory system	7,386	11 (9–13)
Hypertension	3,500	47 (40–54)
Heart disease	2,786	38 (30–45)
Other	1,100	15 (11–20)
Endocrine, nutritional and metabolic diseases	4,757	7 (6–9)
Diabetes	1,951	41 (31–51)
Hyperlipidemia	1,221	26 (17–37)
Other	1,585	33 (24–44)
Diseases of the nervous system	4,753	7 (6–9)
Acute and chronic pain	942	20 (11–32)
Headache and migraine	417	9 (5–14)
Other	3,394	71 (60–81)
Diseases of the respiratory system	3,745	6 (5–7)
Diseases of the genitourinary system	2,535	4 (3–5)
Neoplasms	2,516	4 (2–6)
Diseases of the digestive system	1,974	3 (2–4)
Diseases of the skin	1,340	2 (1–3)
Symptoms, signs, and ill-defined conditions	5,491	8 (7–10)
Injury and poisoning	1,599	2 (2–3)
All other diagnoses	7,816	12 (10–14)
Aged 18–44		
Mental disorders	5,552	37 (31–43)
Diseases of the musculoskeletal system and connective tissue	1,445	10 (7–13)
Diseases of the nervous system	1,227	8 (5–13)
Diseases of the respiratory system	817	5 (4–8)
Symptoms, signs, and ill-defined conditions	1,469	10 (7–13)
Aged 45–64		
Mental disorders	6,466	24 (20–28)
Diseases of the musculoskeletal system and connective tissue	3,809	14 (11–18)
Diseases of the circulatory system	2,345	9 (7–11)
Endocrine, nutritional and metabolic disease	2,108	8 (6–10)
Symptoms, signs, and ill-defined conditions	1,889	7 (5–9)
Aged 65 and over		
Diseases of the circulatory system	4,566	19 (16–24)
Mental disorders	2,587	11 (8–14)
Endocrine, nutritional and metabolic disease	2,267	10 (7–13)
Diseases of the musculoskeletal system and connective tissue	2,174	9 (7–12)
Symptoms, signs, and ill-defined conditions	2,133	9 (7–11)

… Category not applicable.
[1]Percentages for all diagnosis categories sum to 100. Diagnosis subcategories are the percentage of visits within that category.
[2]Includes depression not otherwise specified.

NOTES: All age groups includes all visits by adults aged 18 and over at which benzodiazepines were prescribed. Primary diagnosis estimates are based on the *International Classification of Diseases, 10th Revision, Clinical Modification* (ICD–10–CM) coding system for 2016 and the *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD–9–CM) coding system for 2014 and 2015. Only the top five primary diagnoses are shown for each age group.

SOURCE: NCHS, National Ambulatory Medical Care Survey, 2014–2016.

Table 4. Primary diagnoses at visits in which benzodiazepines were prescribed with opioids for adult patients aged 18 and over, by age group: United States, 2014–2016

Diagnosis category and age group	Annual average number of visits (thousands)	Percent (95% confidence interval)
Total visits	23,210	100 …
All age groups[1]		
Mental disorders	1,880	8 (6–11)
Episodic mood disorder[2]	370	20 (12–31)
Anxiety	703	37 (25–52)
Drug and alcohol dependence	471	25 (15–39)
Other	337	18 (11–27)
Diseases of the musculoskeletal system and connective tissue	5,171	22 (18–27)
Spinal disorder	2,819	54 (44–65)
Rheumatism, excluding back	743	14 (7–27)
Other	1,608	31 (23–41)
Diseases of the circulatory system	2,421	10 (8–14)
Hypertension	1,033	43 (31–55)
Heart disease	1,127	47 (33–60)
Other	261	11 (6–18)
Endocrine, nutritional and metabolic diseases	1,386	6 (4–8)
Diabetes	608	44 (31–58)
Hyperlipidemia	279	20 (11–33)
Other	498	36 (24–50)
Diseases of the nervous system	1,773	8 (5–11)
Diseases of the respiratory system	1,167	5 (3–7)
Diseases of the genitourinary system	929	4 (3–6)
Neoplasms	1,042	4 (3–7)
Diseases of the digestive system	820	3 (2–5)
Diseases of the skin	504	2 (1–4)
Symptoms, signs, and ill-defined conditions	2,085	9 (7–11)
Injury and poisoning	939	4 (3–6)
All other diagnoses	3,094	13 (10–17)
Aged 18–44		
Mental disorders	702	14 (8–22)
Diseases of the musculoskeletal system and connective tissue	1,023	20 (14–28)
Diseases of the nervous system	*546	* …
Symptoms, signs, and ill-defined conditions	632	13 (7–20)
Injury and poisoning	*	* …
Aged 45–64		
Mental disorders	758	7 (4–11)
Diseases of the musculoskeletal system and connective tissue	2,996	28 (21–36)
Diseases of the circulatory system	765	7 (5–10)
Diseases of the nervous system	925	9 (6–12)
Symptoms, signs, and ill-defined conditions	786	7 (5–10)
Aged 65 and over		
Mental disorders	*	6 (3–9)
Diseases of the musculoskeletal system and connective tissue	1,152	15 (11–20)
Diseases of the circulatory system	1,580	21 (14–29)
Symptoms, signs, and ill-defined conditions	667	9 (6–12)
Endocrine, nutritional and metabolic disease	545	7 (5–11)

… Category not applicable.
* Estimate does not meet NCHS standards of reliability.
[1]Percentages for all diagnosis categories sum to 100. Diagnosis subcategories are the percentage of visits within that category.
[2]Includes depression not otherwise specified.

NOTES: All age groups includes all visits by adults aged 18 and over at which benzodiazepines and opioids were prescribed together. Primary diagnosis estimates are based on the *International Classification of Diseases, 10th Revision, Clinical Modification* (ICD–10–CM) coding system for 2016 and the *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD–9–CM) coding system for 2014 and 2015. Only the top five primary diagnoses are shown per age group.

SOURCE: NCHS, National Ambulatory Medical Care Survey, 2014–2016.

Technical Notes

Definition of terms

Major reason for visit—Refers to the provider-assessed main reason for the visit. Reasons were divided into four categories:

New problem—A visit for a condition or illness having a relatively sudden or recent onset (within 3 months of this visit).
Chronic condition—A visit primarily to receive care or examination for a pre-existing chronic condition or illness (onset of condition was 3 months or more before this visit). This includes both routine visits and flare-ups, which is a visit primarily due to a sudden exacerbation of a pre-existing chronic condition.
Pre- and postsurgery—A visit scheduled primarily for care required prior to or following surgery (e.g., presurgery tests or removing sutures).
Preventive care—General medical examinations and routine periodic examinations. Includes prenatal care, annual physicals, well-child examinations, screenings, and insurance examinations.

Prescription status for each listed medication—Refers to whether a prescribed medication was new or continued. A medication was considered new if it was prescribed at the sampled visit, and the designation refers to any new prescriptions—whether a first-time prescription or a previous prescription that was renewed at the sampled visit. The prescription was considered continued if it was prescribed prior to the sampled visit.

Primary care provider—Refers to the question, "Are you the patient's primary care provider?" and can include visits by any American Medical Association and American Osteopathic Association physician specialists of the National Ambulatory Medical Care Survey sample strata (11–13). For instance, a cardiovascular disease specialist could be the patient's primary care provider.

Primary diagnosis—Up to five diagnoses were coded and classified according to the *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD–9–CM) (14) through 2015, and according to the *International Classification of Diseases, 10th Revision, Clinical Modification* (ICD–10–CM) (15) in 2016. Primary diagnoses were classified by major disease categories. An office visit was defined as having a primary diagnosis of a major disease category if codes for that category were found as the first-listed diagnosis, according to the following codes:

Neoplasms—ICD–9–CM codes 140–239 or ICD–10–CM codes C00–D49.
Endocrine, nutritional and metabolic diseases—ICD–9–CM codes 240–279 or ICD–10–CM codes E00–E89.
Diabetes—ICD–9–CM code 250 or ICD–10–CM codes E08–E13.
Hyperlipidemia—ICD–9–CM code 272 or ICD–10–CM code E78.
Mental disorders—ICD–9–CM codes 290–319 or ICD–10–CM codes F01–F99.
Anxiety—ICD–9–CM codes 300.00–300.09 or ICD–10–CM code F41.
Episodic mood disorder and depression not otherwise specified (NOS)—ICD–9–CM codes 269 and 311 or ICD–10–CM codes F30–F39.
Diseases of the nervous system—ICD–9–CM codes 320–389 or ICD–10–CM codes G00–G99.
Acute and chronic pain NOS—ICD–9–CM code 338 or ICD–10–CM code G89.
Headache and migraine—ICD–9–CM codes 339 and 346 or ICD–10–CM codes G43–G44.
Diseases of the circulatory system—ICD–9–CM codes 390–459 or ICD–10–CM codes I00–I99.
Essential hypertension—ICD–9–CM code 401 or ICD–10–CM code I10.
Heart disease, including ischemic heart disease—ICD–9–CM codes 391–392.0, 393–398, 402, 404, 410–416, or 420–429; or ICD–10–CM codes I01, I02, I05, I06, I09, I11, I13, I20, I21, I25–I27, I31–I33, I35, I40, I42, I44, I48, I50, or I51.
Diseases of the respiratory system—ICD–9–CM codes 460–519 or ICD–10–CM codes J00–J99.
Diseases of the digestive system—ICD–9–CM codes 520–579 or ICD–10–CM codes K00–K95.
Diseases of the genitourinary system—ICD–9–CM codes 580–629 or ICD–10–CM codes N00–N99.
Diseases of the skin and subcutaneous tissue—ICD–9–CM codes 680–709 or ICD–10–CM codes L00–L99.
Diseases of the musculoskeletal system and connective tissue—ICD–9–CM codes 710–739 or ICD–10–CM codes M00–M99.
Spinal disorders—ICD–9–CM codes 720–724 or ICD–10–CM codes M40–54.
Rheumatism, excluding back—ICD–9–CM codes 725–729 or ICD–10–CM codes M35, M60, M65, M67, M75, or M79.
Symptoms, signs, and ill-defined conditions—ICD–9–CM codes 780–799 or ICD–10–CM codes R00–R99.
Injury and poisoning—ICD–9–CM codes 800–999 or ICD–10–CM codes S00–T88.
Other (includes infectious and parasitic diseases)—ICD–9–CM codes 001–139 or ICD–10–CM codes A00–B99; diseases of the blood and blood forming organs: ICD–9–CM codes 280–289 or ICD–10–CM codes D50–D89; pregnancy, childbirth and the puerperium including complications: ICD–9–CM codes 630–677 or 760–779, or ICD–10–CM codes O00–O9A and P00–P96; congenital anomalies: ICD–9–CM codes 740–759 or ICD–10–CM codes Q00–Q99; external causes of morbidity: ICD–10–CM codes V00–Y99; and factors influencing health status and contact with health services: ICD–10–CM codes Z00–Z99.

Primary expected source of payment—All expected sources of payment were combined into mutually exclusive categories. For visits with more than one expected source of payment, the

following hierarchy was used: Medicare, Medicaid or Children's Health Insurance Program or other state-based program, private insurance, and no insurance. No insurance was defined as having self-pay, no charge, or charity as payment sources.

Visits at which benzodiazepines were prescribed—At each visit, information for up to 30 drugs was collected. A drug could be provided or prescribed. Benzodiazepines were identified using the Cerner Multum third-level therapeutic category codes for benzodiazepines (69) and benzodiazepine anticonvulsants (203), available from: https://www.cerner.com/solutions/drug-database. Visits with at least one mention of a benzodiazepine prescription were included. Opioids and drugs other than opioids may have been prescribed or provided with the benzodiazepine prescription.

Visits at which benzodiazepines were prescribed with opioids—See previous definition for identifying benzodiazepines. Opioids were identified using the Cerner Multum third-level therapeutic category codes for narcotic analgesics (60) and narcotic analgesic combinations (191), available from: https://www.cerner.com/solutions/drug-database. Visits with at least one mention of an opioid prescription and coprescription of at least one benzodiazepine were included. Other drugs could also have been coprescribed or provided.

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