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Emergency Department Visits by Adults With Chronic Conditions Associated With Severe COVID-19 Illness: United States, 2017–2019

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Abstract

Objective—This report describes emergency department (ED) visits made by adults with selected chronic conditions associated with severe COVID-19 illness.

Methods—Estimates in this report are based on data collected in the 2017–2019 National Hospital Ambulatory Medical Care Survey. Sample data were weighted to produce annual national estimates. Patient characteristics, including age, sex, expected source of payment, medication prescriptions, and hospital admission status, are presented by number of chronic conditions. Selected chronic conditions associated with severe COVID-19 illness include Alzheimer disease or dementia, asthma, cancer, cerebrovascular disease, chronic kidney disease, chronic obstructive pulmonary disease, depression, diabetes, heart disease, HIV, hypertension, obesity, pulmonary embolism, and substance use disorders.

Results—For 2017–2019, 59.5% of ED visits made by adults were among those with one or more chronic conditions. The percentage of ED visits made by adults with three or more chronic conditions was highest among those aged 45–64. Medicare was the most frequently observed expected source of payment among adults with three or more chronic conditions. The percentage of ED visits that resulted in a hospital admission increased with the number of chronic conditions. Overall, hypertension was the most frequently observed chronic condition (33.8% of ED visits by adults) and hypertension and diabetes was the most frequently observed dyad, or pair (33.2% of ED visits by adults with at least two chronic conditions).

Conclusion—Patients with at least one chronic condition made up 59.5% of adult ED visits. These data provide national estimates of ED visits by the number and type of chronic conditions in the adult population pre-COVID-19. Given that the presence of chronic conditions increases the risk of hospital admission among patients with COVID-19, these data may represent a useful baseline to quantify prevalence and association of chronic conditions associated with COVID-19 with hospitalization experience and outcomes.

Keywords: comorbidity • multimorbidity • hospitalization • National Hospital Ambulatory Medical Care Survey

Introduction

In 2018, one-half of U.S. adults had at least one chronic condition, and nearly 30% had multiple chronic conditions (1). The presence of multiple chronic conditions has been associated with increased usage of healthcare resources, including medications, primary care visits, specialist services, and hospitalizations (2). Recent studies suggest that older adults and those with underlying chronic conditions are more susceptible to COVID-19-related hospitalizations, severe COVID-19 illness, and an increased risk of COVID-19-related death (3–6). In the United States as of August 10, 2022, over 1,030,000 confirmed deaths related to COVID-19 have been reported since January 2020 (7). Based on previous research, the Centers for Disease Control and Prevention (CDC) compiled a list of chronic conditions associated with severe COVID-19 illness (8). The National Hospital Ambulatory Medical Care Survey (NHAMCS) asks detailed questions about chronic diseases. In this study, pre-COVID-19 data were examined to provide a baseline measure of how chronic conditions affect emergency department (ED) use. Data on ED visits by patients with



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chronic conditions are also important to understand treatment challenges; these data might serve as a reference for future studies analyzing ED visits by patients with COVID-19 and comorbidities. The chronic conditions associated with increased risk of severe COVID-19 illness were selected for this study. These conditions include Alzheimer disease or dementia, asthma, cancer, cerebrovascular disease (CEBVD), chronic kidney disease (CKD), chronic obstructive pulmonary disease (COPD), depression, diabetes (diabetes mellitus type I, type II, and unspecified), heart disease (including congestive heart failure and coronary artery disease), HIV, hypertension, obesity, history of pulmonary embolism (PE, including deep vein thrombosis and venous thromboembolism), and substance use disorders (including substance abuse or dependence and alcohol misuse, abuse, or dependence). This report provides estimates of ED visits made by adults with these underlying conditions by selected characteristics, using pre-COVID-19 data from 2017 through 2019.

Methods

Data source

NHAMCS data on ED visits for 2017, 2018, and 2019 were used for this analysis. NHAMCS is a nationally representative survey of nonfederal general and short-stay hospitals conducted by the National Center for Health Statistics (NCHS). NHAMCS uses a multistage probability design with samples of geographic primary sampling units (PSUs), hospitals within PSUs, and patient visits within EDs. The plan and operation of NHAMCS are described elsewhere (9). Between 2017 and 2019, the weighted ED response rate varied from 62.8% in 2017, to 88.5% in 2018, and to 82.9% in 2019. ED visit data include patient demographic characteristics as well as visit information obtained from the medical record, including medical diagnoses, primary expected source of payment, diagnostic and therapeutic services ordered or provided, and medications given in the ED or prescribed at discharge.

NHAMCS includes information about whether certain conditions are currently present using a checkbox (yes or no) format. CDC periodically updates the list of chronic conditions associated with severe COVID-19 illness based on available literature (8). The following conditions, which are a subset of the CDC's list of chronic conditions associated with severe COVID-19 illness, are of interest for this analysis and are included: Alzheimer disease or dementia, asthma, cancer, CEBVD, CKD, COPD, depression, diabetes, heart disease, HIV, hypertension, obesity, PE, and substance use disorders. Certain conditions in the CDC's list of chronic conditions associated with severe COVID-19 illness are not included in NHAMCS, so are excluded from this analysis.

During the data editing process, a consistency check was performed to be sure that any record with a visit diagnosis of any of the above chronic conditions also had the appropriate checkbox marked. This report presents ED visits by adults with none of the selected chronic conditions or at least one of the above chronic conditions by selected characteristics including patient sex, age, primary expected source of payment, hospital admission, and number of medications given in the ED, prescribed at discharge, or both. ED visits with no chronic conditions refers to ED visits made by adults with none of the selected chronic conditions shown to be associated with severe COVID-19 illness. The number of chronic conditions was categorized as being diagnosed with one, two, or three or more of the chronic conditions listed above, regardless of the reason for visit. Dyads (pairs) of chronic conditions were identified to explain the differences in ED visits in relation to different combinations of chronic conditions. This information may be useful to identify subgroups who may be at risk of developing complications from COVID-19. The most common dyads by patients with at least two chronic conditions ($n = 14,890$ unweighted visits) were identified.

Analysis

To provide national estimates of ED use, sample weights were applied to each case. Adjustment factors for hospital nonresponse and the inclusion of hospital panels each year are included in the construction of the weights. Estimates of sampling error were made using a Taylor Series approximation, which accounted for the survey's complex sampling design. The study population for the main analyses includes all ED visits made by adults aged 18 and over. All analyses were conducted using 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 tested using a two-sided t statistic at the $p < 0.05$ significance level. All estimates presented meet NCHS data presentation standards for proportions (10) and follow NCHS trend analysis guidelines (11).

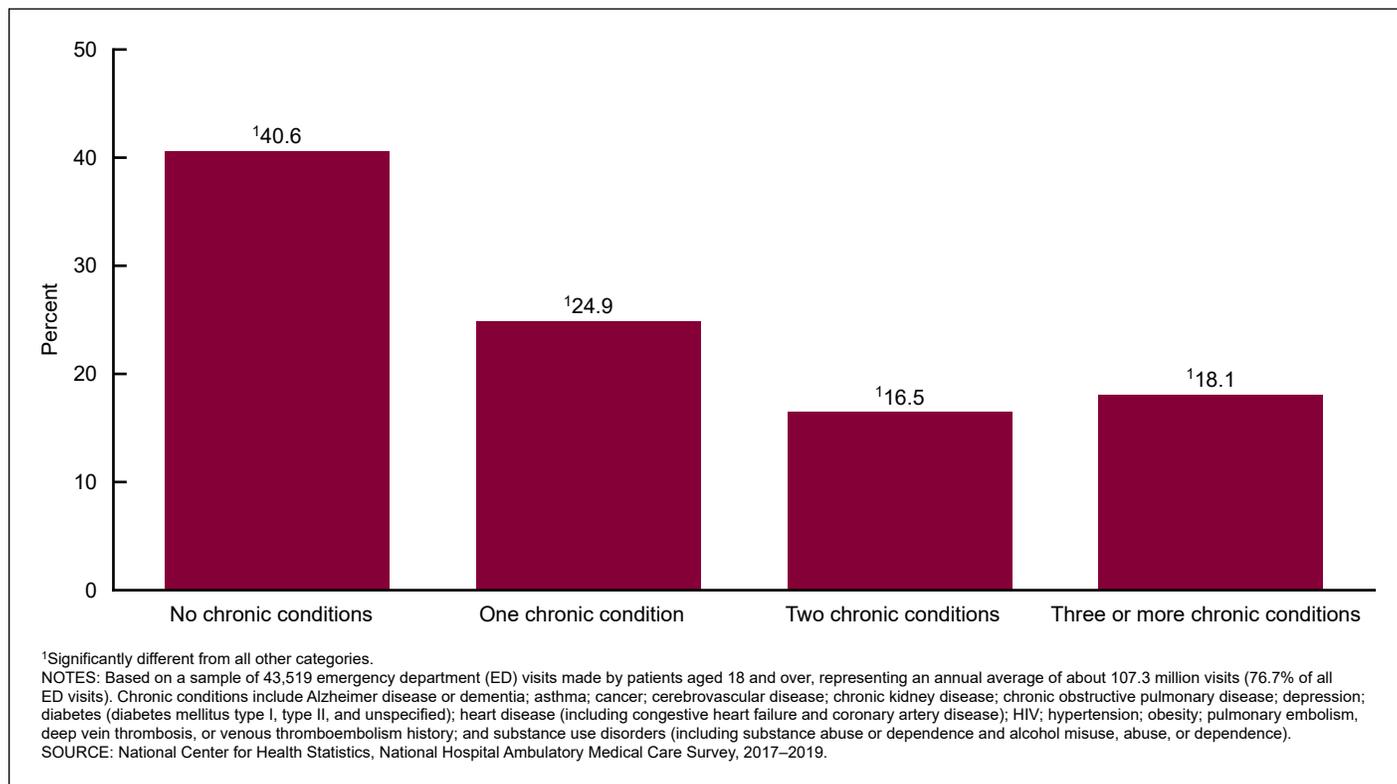
Results

Selected demographic characteristics of ED visits made by adults, by number of chronic conditions

During 2017–2019, about 107.3 million ED visits were made annually by adults: 59.5% of the ED visits were made by adults with at least one chronic condition (24.9% by adults with one chronic condition, 16.5% by adults with two chronic conditions, and 18.1% by adults with three or more chronic conditions) with the remaining 40.6% of visits made by adults with none of the selected chronic conditions (Figure 1).

The percentage of ED visits made by adults with no chronic conditions decreased with increasing age from 70.3% among adults aged 18–44 to 3.3% among visits by adults aged 75 and over (Table 1). Similarly, the percentage of ED visits made by adults with one chronic condition decreased with increasing age from 48.2% among adults aged 18–44 to 11.2% among visits by adults aged 75 and over.

Among visits made by adults with two chronic conditions, the highest percentage was by adults aged 45–64

Figure 1. Percentage of adult emergency department visits, by number of chronic conditions: United States, 2017–2019

(36.0%), followed by adults aged 18–44 (30.0%), adults aged 75 and over (19.1%), and adults aged 65–74 (14.9%). Among visits made by adults with three or more chronic conditions, most visits were made by adults aged 45 and over (adults aged 45–64 made 38.0% of visits, adults aged 65–74 made 21.0% of visits, and adults aged 75 and over made 26.5% of visits). The percentage of visits made by women was higher than the percentage made by men regardless of the number of chronic conditions.

Primary expected source of payment at ED visits, by number of chronic conditions

Overall, private insurance (33.8%) and Medicaid (33.3%) were the most frequently observed primary expected sources of payment among ED visits made by adults with no chronic conditions (Figure 2). Among ED visits by adults with one chronic condition, 31.7% of visits were made by patients with Medicaid as the primary expected source of payment, which was higher than the percentage of visits made by patients with Medicare (26.7%), no

insurance (10.6%), and other sources of payment (3.2%). Medicare was the most frequently observed primary expected source of payment among ED visits made by adults with two chronic conditions (40.8%) and three or more chronic conditions (57.6%).

Number of medications given or prescribed, by number of chronic conditions and age

The percentage of ED visits with 1–2 medications given in the ED, prescribed at discharge, or both ranged from 39.6% among ED visits by adults with no chronic conditions to 31.4% among ED visits by adults with three or more chronic conditions (Table 2, Figure 3).

Regardless of their number of chronic conditions, the percentage of patients with visits where 1–2 medications were given or prescribed was higher compared with the percentage of ED visits without medications (ranging from 20.9% among ED visits by adults with no chronic conditions to 16.3% among both visits by adults with two chronic conditions and among visits by adults with three or more chronic conditions), 3–4 medications (ranging

from 24.7%–23.9%), and 5 or more medications (ranging from 15.1% among ED visits by adults with no chronic conditions to 28.5% among visits by adults with three or more).

The percentage of ED visits with 5 or more medications given or prescribed at discharge increased with increasing number of chronic conditions from 15.1% among ED visits made by adults with no chronic conditions to 28.5% among visits by those with three or more chronic conditions. Similar trends were observed across all age groups.

Percentage of ED visits that ended in hospital admission, by number of chronic conditions and age

ED visits by adults with no chronic conditions were less likely to result in hospital admission compared with ED visits made by adults with one or more chronic conditions (Table 3, Figure 4). Similar trends were observed across all age groups. About five percent (5.2%) of ED visits made by adults with no chronic conditions resulted in a hospital admission compared with 11.2% of visits made by those with one chronic

Figure 2. Percentage of adult emergency department visits, by number of chronic conditions and primary expected source of payment: United States, 2017–2019

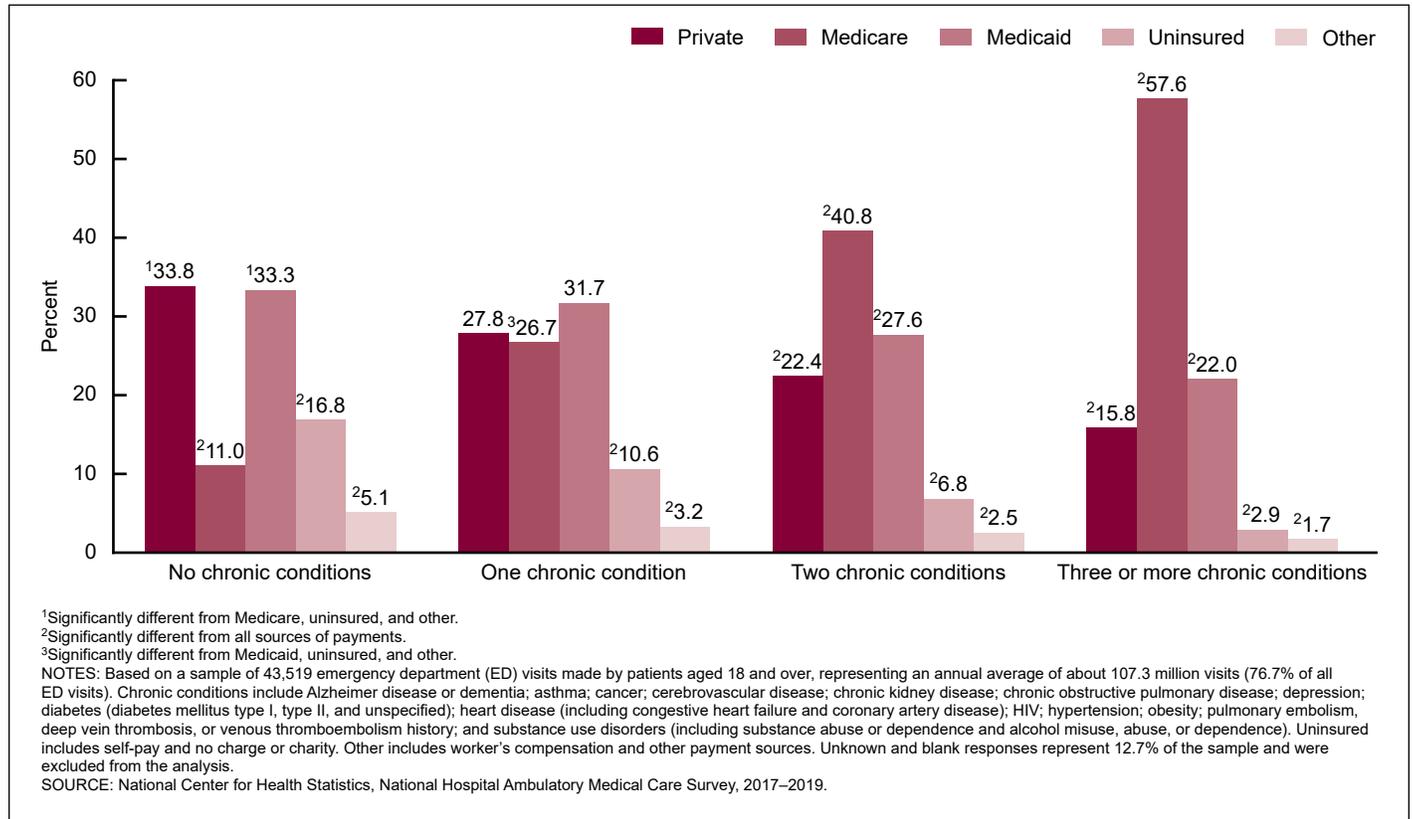
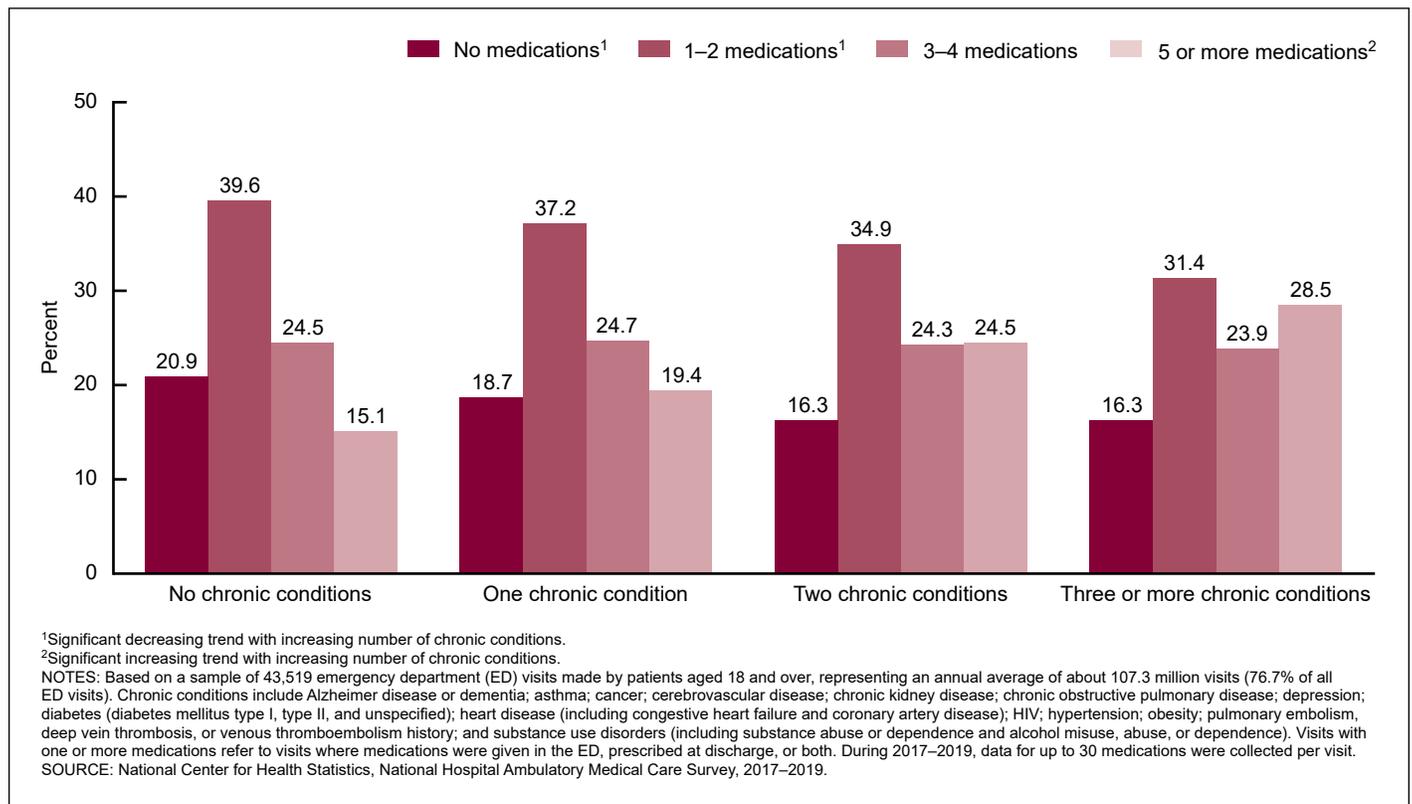


Figure 3. Percentage of adult emergency department visits, by number of chronic conditions and number of medications given or prescribed: United States, 2017–2019



condition, 18.3% of visits made by those with two, and 29.7% of visits made by those with three or more. The percentage of ED visits that resulted in a hospital admission increased with increasing age across all chronic condition categories and increased with the number of chronic conditions by age group.

Most frequently observed chronic conditions

Among ED visits made by all adults, hypertension was the most frequently observed chronic condition (33.8%), followed by diabetes (16.0%), depression (12.7%), heart disease (11.4%), substance use disorder (10.5%), asthma (9.6%), COPD (7.5%), obesity (6.7%), cancer (4.8%), CEBVD (4.4%), CKD (4.1%), PE (2.0%), Alzheimer disease or dementia (1.7%), and HIV (0.7%) (Table 4). Hypertension was the most frequently observed chronic condition for ED visits across all age groups. Diabetes was one of the top three conditions for ED visits made by adults aged 45 and over. Heart disease was one of the top

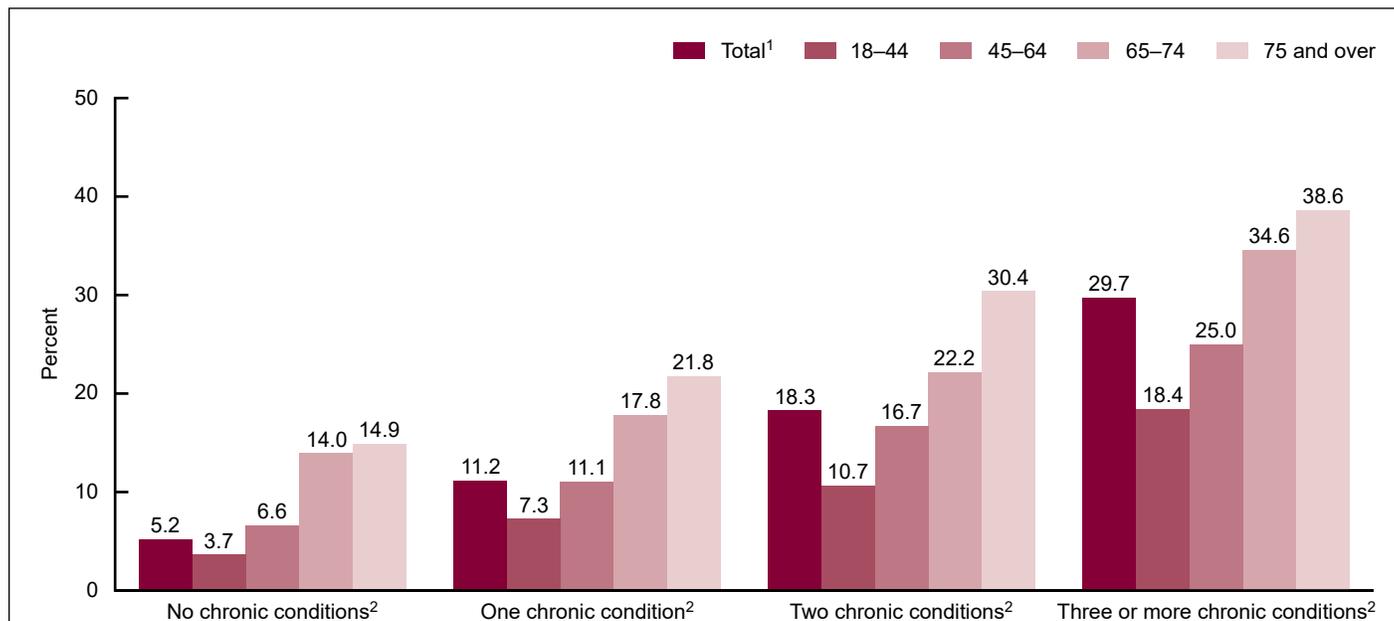
three conditions for ED visits among adults aged 65 and over. Depression was one of the top three conditions for ED visits among adults aged 18–64. Among ED visits made by adults aged 18–44, hypertension (12.1%), depression (11.7%), and substance abuse (11.5%) were the three most frequently observed chronic conditions.

Most frequently observed dyads of chronic conditions

For ED visits made by adults with two or more chronic conditions, hypertension was the most frequently observed chronic condition, appearing in 9 of the 10 chronic condition dyads listed in Table 5. Hypertension and diabetes (33.2%) was the most frequently observed dyad overall and among visits made by adults under age 75 (18.9% among adults aged 18–44, 36.6% for those aged 45–64, and 43.5% for those aged 65–74). Heart disease and hypertension (42.0%) was the most frequently observed dyad among adults aged 75 and over. Among visits made

by adults aged 18–44, depression was a frequently observed chronic condition, appearing in three of the six most frequently observed dyads. Among visits made by adults aged 65 and over, heart disease was a frequently observed chronic condition, appearing in three of the eight most frequently observed dyads for the two age groups (adults aged 65–74 and 75 and over). Among adults aged 18–44 with two or more chronic conditions, the three most frequently observed dyads were hypertension and diabetes (18.9%), substance abuse and depression (17.8%), and hypertension and depression (15.5%). Among adults aged 45–64 with two or more chronic conditions, the three most frequently observed dyads were hypertension and diabetes (36.6%), hypertension and heart disease (21.9%), and hypertension and depression (20.1%). Among adults aged 65–74 with two or more chronic conditions, the three most frequently observed dyads were hypertension and diabetes (43.5%), hypertension and heart disease (34.8%), and hypertension and COPD (19.9%). Among adults aged

Figure 4. Percentage of adult emergency department visits that resulted in hospital admission, by number of chronic conditions and age: United States, 2017–2019



¹Significant increasing trend with increasing number of chronic conditions.

²Significant increasing trend with increasing age.

NOTES: Based on a sample of 43,519 emergency department (ED) visits made by patients aged 18 and over, representing an annual average of about 107.3 million visits (76.7% of all ED visits). The bars represent the percentage of ED visits that resulted in a hospital admission over the total ED visits made by adults. The complementary percentages (visits not admitted) are not shown. Visits that resulted in a hospital admission represent 13.3% of all ED visits made by adults. Chronic conditions include Alzheimer disease or dementia; asthma; cancer; cerebrovascular disease; chronic kidney disease; chronic obstructive pulmonary disease; depression; diabetes (diabetes mellitus type I, type II, and unspecified); heart disease (including congestive heart failure and coronary artery disease); HIV; hypertension; obesity; pulmonary embolism, deep vein thrombosis, or venous thromboembolism history; and substance use disorders (including substance abuse or dependence and alcohol misuse, abuse, or dependence).

SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2017–2019.

75 and over with two or more chronic conditions, the three most frequently observed dyads were hypertension and heart disease (42.0%), hypertension and diabetes (33.1%), and diabetes and heart disease (18.0%).

Discussion

This study shows that annually for 2017–2019, on average, almost 60% of ED visits made by adults were made by patients with at least one of the chronic conditions that have been shown to be associated with severe COVID-19 illness. The chronic conditions in this report were selected because, according to CDC, they are associated with increased risk of severe COVID-19 illness (8). Although the specific chronic conditions differ from those used in previous studies, the distribution in this study of the number of chronic conditions in adults visiting the ED aligns with the distribution of the prevalence of these conditions in the U.S. adult population. Data from the 2018 National Health Interview Survey show that over one-half of adults (51.8%), or 129.2 million people, had at least 1 of 10 selected chronic conditions (arthritis, cancer, COPD, coronary heart disease, current asthma, diabetes, hepatitis, hypertension, stroke, and weak or failing kidneys) (1). Data from the 2015–2018 National Health and Nutrition Examination Survey show that 76.2% of U.S. adults, or about 180.3 million, had at least one of the following chronic conditions or health concerns: asthma, CKD, COPD, diabetes, hypertension, obesity, serious heart disease, or smoking (12).

ED visits made by patients with two or more chronic conditions increased with age, consistent with the distribution of chronic conditions in the older population (1). ED visits at which Medicare was the expected primary source of payment increased with increasing number of chronic conditions. This reflects differences in ED visits made by adults with chronic conditions by age, with older adults being more represented than younger adults. The percentage of ED visits with 5 or more medications given in the ED or prescribed at discharge and the percentage of ED visits that resulted in hospital admission both increased with

increasing number of chronic conditions. These findings highlight the potential impact of chronic conditions on ED use and outcome. Hypertension was the most frequently observed chronic condition at ED visits by adults, consistent with the relatively high prevalence of hypertension in the general population (13,14). Hypertension and diabetes was the most frequently observed chronic condition dyad at ED visits made by adults with two or more chronic conditions. In 2019, 28.7 million people (including 28.5 million adults) in the United States, or 8.7% of the population, had a diagnosis of diabetes (15), which may explain the high frequency of ED visits by adults with diabetes.

There are limitations to this analysis. First, patients with “no chronic conditions” refers to the selected chronic conditions considered to be associated with severe COVID-19 illness, but other chronic conditions may have been present (for example, hyperlipidemia). Second, some conditions associated with severe COVID-19 illness were excluded from this analysis because they were not included in the checkbox portion of NHAMCS (such as smoking status; tuberculosis; or disabilities, including Down syndrome). Third, NHAMCS does not collect information on whether medications prescribed were taken by the patient; as a result, medication adherence was not examined in this report. Even with these limitations, the findings from this report provide insight into the pattern of ED use among adults with chronic conditions. These findings, taken from pre-COVID-19 data, provide a baseline or reference measure for future studies seeking to better understand healthcare resources used by patients with specific, COVID-19-associated comorbidities.

Monitoring ED visits made by adults at highest risk of severe COVID-19-related illness is important for understanding the health burden of COVID-19 and for planning prevention strategies. Ongoing monitoring of the presence of these underlying chronic conditions at ED visits will continue to inform COVID-19 response efforts.

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Table 1. Selected demographic characteristics of adult emergency department visits, by number of chronic conditions: United States, 2017–2019

Emergency department visits	No chronic conditions ¹		One chronic condition ¹		Two chronic conditions		Three or more chronic conditions	
	Annual average number of visits	Percent (95% confidence interval)	Annual average number of visits	Percent (95% confidence interval)	Annual average number of visits	Percent (95% confidence interval)	Annual average number of visits	Percent (95% confidence interval)
Overall	43,542,535	100.0 (...)	26,663,951	100.0 (...)	17,696,608	100.0 (...)	19,388,155	100.0 (...)
Age group (years)								
18–44	30,619,746	70.3 (69.2–71.5)	12,848,003	48.2 (46.5–49.9)	5,302,360	² 30.0 (28.2–31.8)	2,810,378	14.5 (13.3–15.8)
45–64	9,407,277	21.6 (20.8–22.4)	8,121,335	30.5 (29.3–31.7)	6,375,860	³ 36.0 (34.5–37.6)	7,365,004	³ 38.0 (36.3–39.7)
65–74	2,068,249	4.8 (4.3–5.3)	2,710,238	10.2 (9.4–11.0)	2,644,696	14.9 (13.8–16.2)	4,072,669	⁴ 21.0 (19.8–22.2)
75 and over	1,447,262	3.3 (2.9–3.9)	2,984,376	11.2 (10.2–12.3)	3,373,692	⁵ 19.1 (17.7–20.5)	5,140,103	^{4,5} 26.5 (24.9–28.2)
Sex								
Men	18,091,119	41.5 (40.4–42.7)	11,314,168	42.4 (41.2–43.7)	7,678,022	43.4 (41.9–44.9)	8,566,992	44.2 (42.5–45.9)
Women ⁶	25,451,415	58.5 (57.3–59.6)	15,349,783	57.6 (56.3–58.8)	10,018,586	56.6 (55.1–58.2)	10,821,163	55.8 (54.1–57.5)

... Category not applicable.

¹Significant decreasing trend with increasing age.

²Significantly higher than 65–74 and 75 and over.

³Significantly higher than all other age groups.

⁴Significantly higher than 18–44.

⁵Significantly higher than 65–74.

⁶Significant difference between men and women among all visits.

NOTES: Based on a sample of 43,519 emergency department (ED) visits made by patients aged 18 and over, representing an annual average of about 107.3 million visits (76.7% of all ED visits). Chronic conditions include Alzheimer disease or dementia; asthma; cancer; cerebrovascular disease; chronic kidney disease; chronic obstructive pulmonary disease; depression; diabetes (diabetes mellitus type I, type II, and unspecified); heart disease (including congestive heart failure and coronary artery disease); HIV; hypertension; obesity; pulmonary embolism, deep vein thrombosis, or venous thromboembolism history; and substance use disorders (including substance abuse or dependence and alcohol misuse, abuse, or dependence).

SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2017–2019.

Table 2. Number of medications given in the emergency department, prescribed at discharge, or both, by number of chronic conditions and age: United States, 2017–2019

Age group (years)	No chronic conditions	One chronic condition	Two chronic conditions	Three or more chronic conditions
18–44				
Percent (95% confidence interval)				
No medications ¹	² 20.1 (18.5–21.8)	19.1 (17.2–21.0)	16.8 (14.9–19.0)	15.7 (12.7–19.2)
1–2 medications ¹	³ 40.5 (39.1–41.9)	37.5 (35.8–39.3)	34.1 (31.1–37.3)	² 29.9 (26.7–33.4)
3–4 medications	24.8 (23.7–26.0)	³ 25.6 (23.8–27.4)	² 27.0 (24.1–30.1)	23.1 (20.2–26.4)
5 or more medications ⁴	14.6 (13.5–15.8)	17.9 (16.3–19.6)	22.1 (19.5–25.0)	³ 31.3 (27.5–35.3)
45–64				
No medications ¹	22.0 (19.4–24.8)	17.0 (14.8–19.4)	15.5 (13.7–17.5)	15.4 (12.9–18.3)
1–2 medications ¹	37.2 (34.9–39.5)	36.4 (34.0–38.8)	33.8 (31.2–36.5)	29.5 (26.9–32.2)
3–4 medications	24.8 (22.3–27.5)	25.3 (23.2–27.5)	24.5 (22.2–27.0)	25.4 (23.3–27.6)
5 or more medications ⁴	16.1 (14.3–18.0)	21.4 (19.1–24.0)	26.2 (23.6–29.0)	29.7 (26.9–32.6)
65–74				
No medications ¹	22.5 (18.8–26.7)	19.5 (16.2–23.2)	16.3 (13.3–19.8)	16.8 (14.0–20.0)
1–2 medications ¹	39.6 (35.8–43.6)	37.0 (33.2–41.0)	36.2 (32.5–40.0)	32.1 (29.2–35.1)
3–4 medications	20.1 (16.9–23.6)	23.3 (19.7–27.3)	22.2 (19.2–25.5)	22.5 (19.7–25.6)
5 or more medications ⁴	17.8 (14.5–21.7)	20.2 (16.8–24.2)	25.4 (21.8–29.4)	28.7 (25.2–32.5)
75 and over				
No medications ¹	28.4 (22.5–35.2)	21.1 (18.1–24.5)	17.1 (14.3–20.4)	17.5 (15.0–20.2)
1–2 medications	35.0 (29.1–41.2)	38.4 (34.2–42.8)	37.2 (33.5–41.0)	34.3 (31.3–37.3)
3–4 medications	21.4 (17.2–26.4)	21.0 (17.5–25.1)	21.2 (18.5–24.2)	23.1 (20.8–25.6)
5 or more medications ⁴	15.2 (11.6–19.7)	19.4 (16.0–23.3)	24.5 (21.0–28.4)	25.2 (21.6–29.2)

¹Significant decreasing trend with increasing number of chronic conditions.²Significant increasing trend with increasing age.³Significant decreasing trend with increasing age.⁴Significant increasing trend with increasing number of chronic conditions.

NOTES: Based on a sample of 43,519 emergency department (ED) visits made by patients aged 18 and over, representing an annual average of about 107.3 million visits (76.7% of all ED visits). Chronic conditions include Alzheimer disease or dementia; asthma; cancer; cerebrovascular disease; chronic kidney disease; chronic obstructive pulmonary disease; depression; diabetes (diabetes mellitus type I, type II, and unspecified); heart disease (including congestive heart failure and coronary artery disease); HIV; hypertension; obesity; pulmonary embolism, deep vein thrombosis, or venous thromboembolism history; and substance use disorders (including substance abuse or dependence and alcohol misuse, abuse, or dependence). Visits with one or more medications refer to visits where medications were given in the ED, prescribed at discharge, or both. During 2017–2019, data for up to 30 medications were collected per visit.

SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2017–2019.

Table 3. Percentage of adult emergency department visits that resulted in hospital admission, by number of chronic conditions and age: United States, 2017–2019

Age group ² (years)	No chronic conditions ¹	One chronic condition ¹	Two chronic conditions ¹	Three or more chronic conditions ¹
	Percent (95% confidence interval)			
Overall	5.2 (4.6–5.8)	11.2 (9.9–12.5)	18.3 (16.7–20.1)	29.7 (27.1–32.3)
18–44	3.7 (3.2–4.3)	7.3 (6.3–8.5)	10.7 (8.9–12.7)	18.4 (15.0–22.5)
45–64	6.6 (5.5–7.9)	11.1 (9.5–12.9)	16.7 (14.4–19.2)	25.0 (22.2–28.2)
65–74	14.0 (10.8–18.0)	17.8 (14.1–22.3)	22.2 (18.8–25.9)	34.6 (30.8–38.5)
75 and over	14.9 (11.4–19.3)	21.8 (18.3–25.8)	30.4 (26.9–34.2)	38.6 (35.0–42.3)

¹Significant increasing trend with increasing age.

²Significant increasing trend with increasing number of chronic conditions.

NOTES: Based on a sample of 43,519 emergency department (ED) visits made by patients aged 18 and over, representing an annual average of about 107.3 million visits (76.7% of all ED visits). Complementary percentages (visits not admitted) are not shown. Visits that resulted in a hospital admission represent 13.3% of all ED visits made by adults. Chronic conditions include Alzheimer disease or dementia; asthma; cancer; cerebrovascular disease; chronic kidney disease; chronic obstructive pulmonary disease; depression; diabetes (diabetes mellitus type I, type II, and unspecified); heart disease (including congestive heart failure and coronary artery disease); HIV; hypertension; obesity; pulmonary embolism, deep vein thrombosis, or venous thromboembolism history; and substance use disorders (including substance abuse or dependence and alcohol misuse, abuse, or dependence).

SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2017–2019.

Table 4. Percentage of selected chronic conditions among adult emergency department visits, by age: United States, 2017–2019

Chronic condition and age group (years)	Percent (95% confidence interval)
All adults	
Hypertension	33.8 (32.7–34.9)
Diabetes	16.0 (15.5–16.6)
Depression	12.7 (12.0–13.5)
Heart disease ¹	11.4 (10.8–12.0)
Substance use disorders ²	10.5 (9.6–11.5)
Asthma	9.6 (9.1–10.1)
COPD ³	7.5 (7.1–8.0)
Obesity	6.7 (6.0–7.6)
Cancer	4.8 (4.5–5.2)
Cerebrovascular disease	4.4 (4.0–4.7)
Chronic kidney disease	4.1 (3.8–4.5)
PE ⁴	2.0 (1.8–2.2)
Alzheimer disease or dementia	1.7 (1.5–1.9)
HIV	0.7 (0.6–0.9)
18–44	
Hypertension	12.1 (11.3–12.9)
Depression	11.7 (10.8–12.7)
Substance use disorders ²	11.5 (10.5–12.7)
Asthma	10.6 (9.9–11.4)
Diabetes	6.0 (5.5–6.6)
Obesity	5.4 (4.7–6.2)
Heart disease ¹	1.6 (1.4–1.9)
COPD ³	1.6 (1.4–1.8)
PE ⁴	0.9 (0.8–1.1)
Cancer	0.9 (0.7–1.1)
Chronic kidney disease	0.8 (0.6–1.0)
Cerebrovascular disease	0.7 (0.5–0.9)
HIV	0.6 (0.4–0.9)
Alzheimer disease or dementia	*
45–64	
Hypertension	44.8 (43.2–46.4)
Diabetes	22.6 (21.6–23.5)
Depression	15.1 (14.1–16.2)
Substance use disorders ²	13.0 (11.8–14.4)
Heart disease ¹	12.7 (11.9–13.6)
COPD ³	10.4 (9.8–11.1)
Asthma	9.9 (9.2–10.7)
Obesity	8.9 (7.8–10.2)
Cancer	5.4 (4.9–6.0)
Cerebrovascular disease	5.0 (4.4–5.6)
Chronic kidney disease	4.3 (3.8–4.9)
PE ⁴	2.5 (2.1–2.9)
HIV	1.2 (0.9–1.5)
Alzheimer disease or dementia	0.4 (0.3–0.7)
65–74	
Hypertension	61.3 (58.7–63.8)
Diabetes	31.2 (29.3–33.1)
Heart disease ¹	25.2 (23.5–27.0)
COPD ³	16.8 (15.3–18.5)
Depression	13.2 (12.0–14.6)
Cancer	10.8 (9.5–12.2)
Asthma	9.2 (8.2–10.3)
Cerebrovascular disease	8.9 (7.8–10.3)
Obesity	8.6 (7.3–10.1)
Chronic kidney disease	8.5 (7.4–9.8)
Substance use disorders ²	7.5 (6.3–8.8)
PE ⁴	3.1 (2.4–3.9)
Alzheimer disease or dementia	2.8 (2.1–3.6)
HIV	*

Table 4. Percentage of selected chronic conditions among adult emergency department visits, by age: United States, 2017–2019—Con.

Chronic condition and age group (years)	Percent (95% confidence interval)
75 and over	
Hypertension	69.1 (66.9–71.3)
Heart disease ¹	34.5 (32.6–36.6)
Diabetes	26.8 (25.3–28.4)
COPD ³	16.0 (14.4–17.7)
Cerebrovascular disease	13.7 (12.5–15.1)
Cancer	13.7 (12.4–15.2)
Chronic kidney disease	13.2 (11.6–14.9)
Depression	10.8 (9.6–12.2)
Alzheimer disease or dementia	10.6 (9.3–12.0)
Asthma	5.3 (4.6–6.2)
Obesity	4.9 (4.0–5.9)
PE ⁴	3.9 (3.2–4.7)
Substance abuse ²	2.9 (2.1–4.1)
HIV	*

* Estimate does not meet National Center for Health Statistics standards of reliability.

¹Includes congestive heart failure and coronary artery disease.

²Includes substance abuse or dependence and alcohol misuse, abuse, or dependence.

³Chronic obstructive pulmonary disease.

⁴History of pulmonary embolism; also includes deep vein thrombosis or venous thromboembolism.

NOTES: Based on a sample of 43,519 emergency department (ED) visits made by patients aged 18 and over, representing an annual average of about 107.3 million visits (76.7% of all ED visits). Chronic conditions include Alzheimer disease or dementia; asthma; cancer; cerebrovascular disease; chronic kidney disease; COPD; depression; diabetes (diabetes mellitus type I, type II, and unspecified); heart disease (including congestive heart failure and coronary artery disease); HIV; hypertension; obesity; PE, deep vein thrombosis, or venous thromboembolism history; and substance use disorders (including substance abuse or dependence and alcohol misuse, abuse, or dependence). The combined total visits by patients with chronic conditions exceeds 100% because more than one chronic condition may be reported per visit.

SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2017–2019.

Table 5. Ten most frequent chronic condition dyads among adult emergency department visits with at least two chronic conditions, by age group: United States, 2017–2019

Chronic condition and age group (years)	Percent (95% confidence interval)
All adults	
Hypertension and diabetes	33.2 (32.0–34.4)
Hypertension and heart disease ¹	25.5 (24.4–26.7)
Hypertension and depression	16.5 (15.6–17.5)
Hypertension and COPD ²	13.6 (12.9–14.4)
Heart disease and diabetes	13.3 (12.5–14.1)
Hypertension and obesity	11.5 (10.3–12.8)
Hypertension and asthma	10.6 (9.9–11.4)
Hypertension and substance use disorders ³	10.2 (9.2–11.3)
Hypertension and chronic kidney disease	9.8 (9.0–10.7)
Hypertension and cerebrovascular disease	9.3 (8.6–10.1)
18–44	
Hypertension and diabetes	18.9 (16.5–21.5)
Depression and substance use disorders ³	17.8 (15.7–20.1)
Hypertension and depression	15.5 (14.0–17.1)
Asthma and depression	14.5 (12.5–16.8)
Hypertension and substance use disorders ³	13.2 (11.6–14.9)
Hypertension and asthma	11.4 (10.0–13.0)
Hypertension and obesity	11.3 (9.7–13.1)
Asthma and substance use disorders ³	8.9 (7.4–10.7)
Depression and obesity	8.8 (7.5–10.3)
Asthma and obesity	7.6 (6.4–9.1)
45–64	
Hypertension and diabetes	36.6 (35.1–38.2)
Hypertension and heart disease ¹	21.9 (20.2–23.7)
Hypertension and depression	20.1 (18.5–21.7)
Hypertension and COPD ²	14.8 (13.5–16.2)
Hypertension and obesity	14.6 (12.8–16.6)
Hypertension and substance use disorders ³	14.2 (12.6–15.9)
Heart disease ¹ and diabetes	12.9 (11.8–14.2)
Hypertension and asthma	12.6 (11.5–13.9)
Depression and diabetes	9.7 (8.7–10.7)
Diabetes and obesity	9.4 (8.5–10.5)
65–74	
Hypertension and diabetes	43.5 (41.1–45.9)
Hypertension and heart disease ¹	34.8 (32.4–37.3)
Hypertension and COPD ²	19.9 (18.0–22.0)
Heart disease ¹ and diabetes	19.6 (17.8–21.5)
Hypertension and depression	16.4 (14.8–18.1)
Heart disease ¹ and COPD ²	12.8 (11.3–14.4)
Hypertension and chronic kidney disease	12.6 (10.9–14.4)
Hypertension and cancer	12.3 (10.8–14.1)
Hypertension and cerebrovascular disease	12.3 (10.6–14.1)
Hypertension and obesity	11.9 (10.1–13.9)
75 and over	
Hypertension and heart disease ¹	42.0 (39.8–44.3)
Hypertension and diabetes	33.1 (31.2–35.1)
Heart disease ¹ and diabetes	18.0 (16.5–19.7)
Hypertension and COPD ²	17.2 (15.5–19.1)
Hypertension and chronic kidney disease	17.0 (15.1–19.0)
Hypertension and cerebrovascular disease	16.5 (14.9–18.2)
Hypertension and cancer	14.6 (12.9–16.4)
Heart disease ¹ and COPD ²	12.2 (10.7–13.8)
Hypertension and depression	12.0 (10.6–13.6)
Heart disease ¹ and chronic kidney disease	11.3 (10.0–12.9)

¹Includes congestive heart failure and coronary artery disease.²Chronic obstructive pulmonary disease.³Includes substance abuse or dependence and alcohol misuse, abuse, or dependence.

NOTES: Based on a sample of 14,890 emergency department (ED) visits made by patients aged 18 and over with at least two chronic conditions, representing an annual average of about 37.1 million visits (34.6% of all ED visits made by adults). Chronic conditions include Alzheimer disease or dementia; asthma; cancer; cerebrovascular disease; chronic kidney disease; COPD; depression; diabetes (diabetes mellitus type I, type II, and unspecified); heart disease (including congestive heart failure and coronary artery disease); HIV; hypertension; obesity; pulmonary embolism, deep vein thrombosis, or venous thromboembolism history; and substance use disorders (including substance abuse or dependence and alcohol misuse, abuse, or dependence).

SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2017–2019.

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