



Multiple Chronic Conditions in the United States

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Preface

In 2014, 60 percent of Americans had at least one chronic condition, and 42 percent had multiple chronic conditions. These proportions have held steady since 2008. Americans with chronic conditions utilize more—and spend more on—health care services and may have reduced physical and social functioning. This chartbook updates previous versions with more recent data on the prevalence of multiple chronic conditions (2008–2014) and associated health care utilization and spending. It explores disparities in the prevalence of chronic conditions and associated utilization of health care services and analyzes functional or other limitations for those with multiple chronic conditions. This chartbook should be of interest to researchers, policymakers, and practitioners, as well as to the general public.

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Introduction



Six in ten adult Americans had at least one chronic condition in 2014, the latest year for which data are available, and four in ten had more than one. As this chartbook shows, chronic disease is a burden not only for these patients but also for the health care system overall. Those with multiple chronic conditions have poorer health, use more health services, and spend more on health care—trends that have been stable since 2008.

This chartbook assesses the prevalence of multiple chronic conditions in the United States and explores the associated health care utilization and medical spending. This version updates and expands on previous editions: the Agency for Healthcare Research and Quality's (AHRQ's) 2014 edition of the *Multiple Chronic Conditions Chartbook*,¹⁰ as well as previous iterations from the Robert Wood Johnson Foundation and Johns Hopkins University.^{11, 12}

The data confirm that the prevalence of multiple chronic conditions—that is, having two or more chronic diseases simultaneously—is highest among older adults. It also shows that women are more likely than men to have multiple chronic conditions, as many women live longer than men do. The

What is a chronic condition?

A chronic condition is a physical or mental health condition that lasts more than one year and causes functional restrictions or requires ongoing monitoring or treatment.⁷

When a patient has more than one chronic condition—for example, diabetes, hypertension, and mood disorders—treatment can be difficult to manage. Treatment strategies or drug regimens may be similar—but can be very different—and one chronic condition may be better managed than the others.¹

prevalence of multiple chronic conditions is higher in non-Hispanic whites than in other racial/ethnic groups, which may reflect differences in access to care, rather than in the actual prevalence of chronic disease. In addition, those with more conditions have greater reported functional, social, and cognitive limitations.

For policymakers, planning for the care of people with complex chronic conditions is increasingly urgent as baby boomers become eligible for Medicare. Previous work has shown that people with multiple chronic conditions face more financial obligations and functional limitations^{2,3} and often have worse health outcomes.^{4,5,6} Other work has shown that people with multiple chronic conditions have higher hospital readmission rates⁷ and much higher health care expenses.⁸ Multiple physical health conditions can be difficult to manage, especially when coupled with depression or other mental health conditions. In addition, younger generations can be affected by the financial and social implications of caring for the millions of older Americans.⁹



Methodology

This study uses the Medical Expenditure Panel Survey (MEPS) from AHRQ.¹³ MEPS is a publicly available, nationally representative sample of the U.S. civilian, noninstitutionalized population. It is important to note that institutionalized adults are excluded from the charts because they are not included in the MEPS data.

For the purposes of this chartbook, we define *multiple chronic conditions* as having two or more conditions. We used the MEPS survey weights to create nationally representative estimates.

We attempted to replicate the methods of earlier chartbooks. Similar to previous iterations, this version identifies distinct conditions using the Clinical Classification Software codes that are part of the MEPS dataset, which group individual International Classification of Diseases, ninth edition (ICD-9) diagnosis codes into distinct conditions.¹⁴ To identify which conditions are chronic, we used the Chronic Conditions Indicator, developed by Hwang and colleagues.^{15, 16}

Most of the charts in this book use data from 2014, the most recent year available for adults 18 and older. In the 2007–2008 panels, MEPS added a set of questions specifically asking whether respondents had certain priority conditions; as a result, there is a marked increase in the reported prevalence of chronic conditions overall at this point. Therefore, we restrict the presentation of trends in prevalence of chronic conditions over time to 2008–2014.

Our results have several limitations that should be taken into account when using charts from this publication. The results may underestimate the prevalence of chronic conditions because the data do not include individuals living in institutions, who

may have a larger number of chronic conditions. While the population of institutionalized adults is small for those ages 18–64, older adults are more likely to be in long-term care facilities, so we may underestimate the prevalence among older adults. About 3 percent of adults 65 and older were in full-year long-term nursing care facilities in 2013, the latest year for which data are available from the Medicare Current Beneficiary Survey.¹⁷ Because MEPS is a survey that relies on respondents to report on their own health, the data may also underrepresent the actual prevalence of chronic disease if individuals are not aware that they have the condition. We can only measure the prevalence of those who have been treated or told by a health care provider that they have a chronic condition (also called the “treated prevalence”). Finally, it has been documented elsewhere that MEPS underestimates total spending on health care services, and the underestimate can be as much as 17.6 percent, depending on the service type.¹⁸ The estimates on average spending should, therefore, be interpreted with caution. Despite these limitations, MEPS is one of the best sources of data on U.S. health care utilization, spending, access to care, insurance coverage, and demographic information.

A full description of the methodology can be found in the appendix.



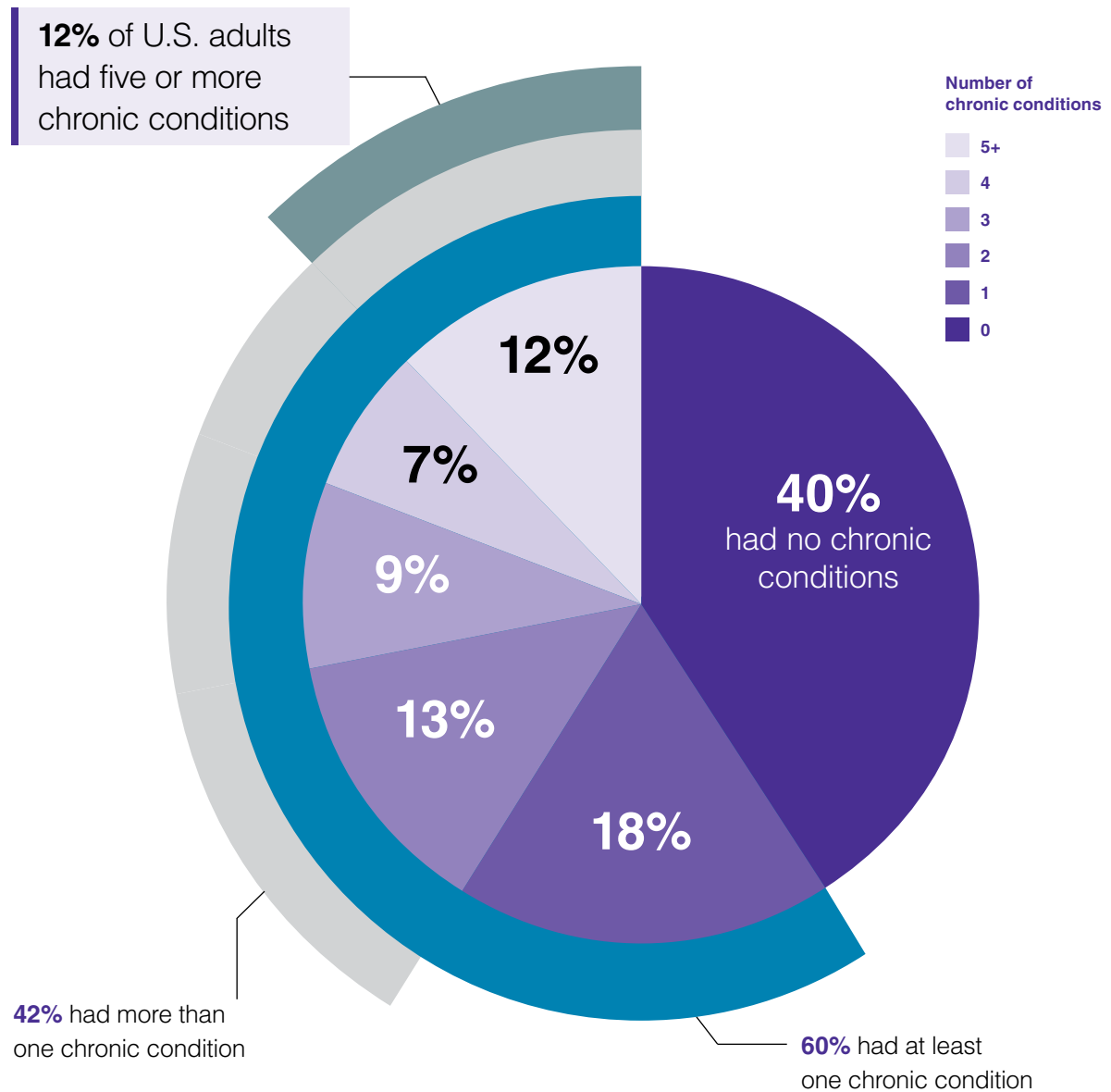


CHAPTER 1

Prevalence of Multiple Chronic Conditions

As of 2014, 60 percent of American adults had at least one chronic condition, and 42 percent had more than one chronic condition.

Figure 1.1. Percentage of U.S. Adults with Chronic Conditions, by Number of Chronic Conditions (2014)

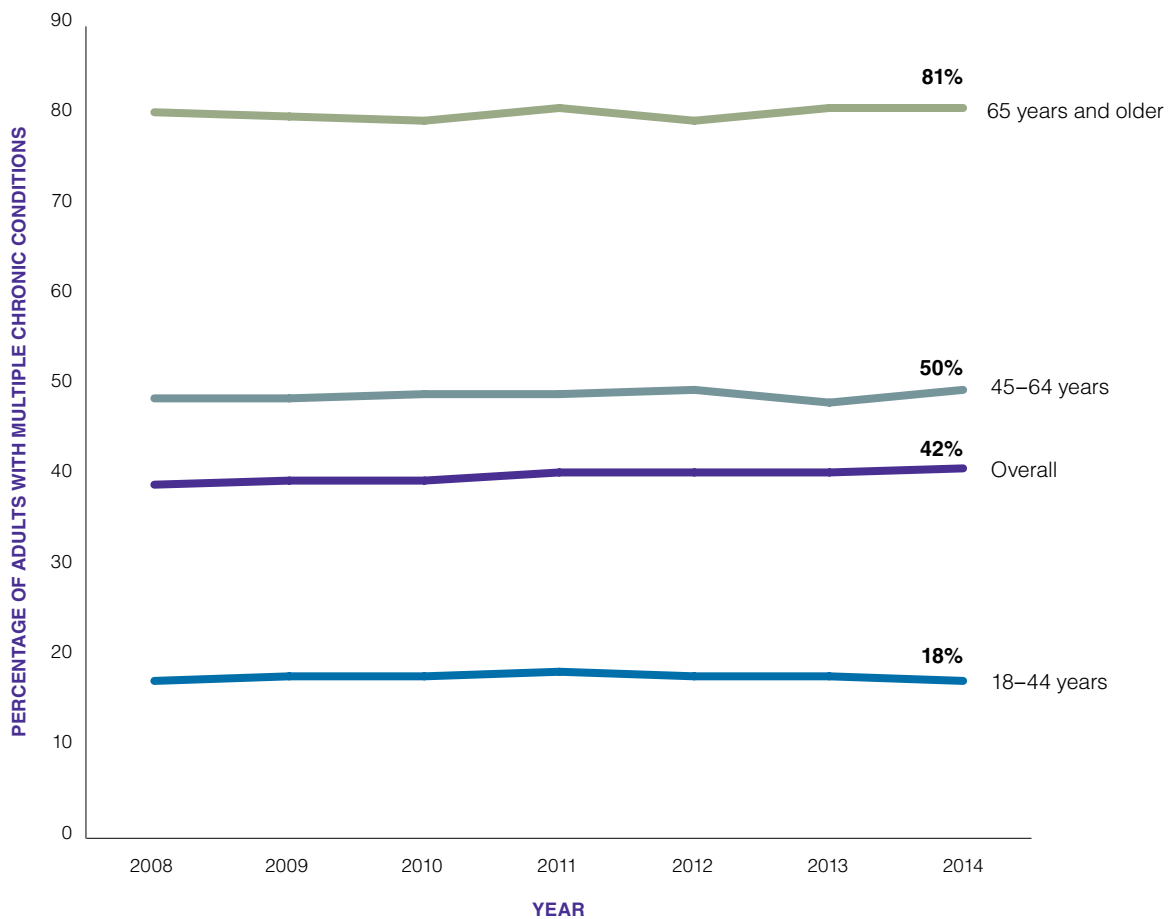


NOTE: Percentages may not total 100 because of rounding.

The prevalence of multiple chronic conditions is higher among older adults.

Over time, the prevalence of U.S. adults with multiple chronic conditions has remained steady, at around 42 percent.

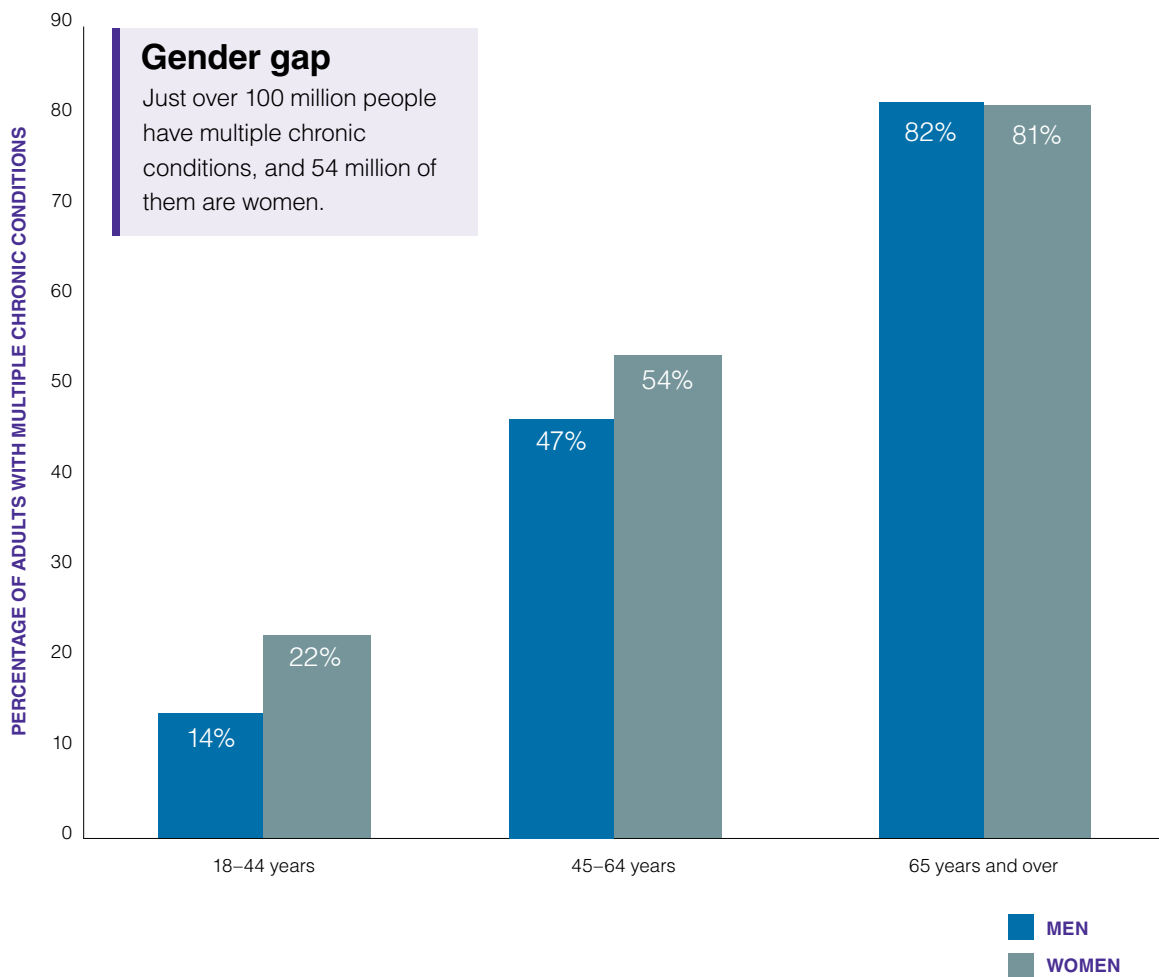
Figure 1.2. Prevalence of Multiple Chronic Conditions, by Age (2008–2014)



Women ages 18 through 64 have a higher prevalence of multiple chronic conditions than men.

The presence of multiple chronic conditions increases with age for both genders. Because our estimates of prevalence are based on self-reported conditions, we do not know if the higher prevalence among women is a result of true differences in prevalence or of other factors, such as women being more likely to be diagnosed because they may visit their health care providers more often.¹⁹

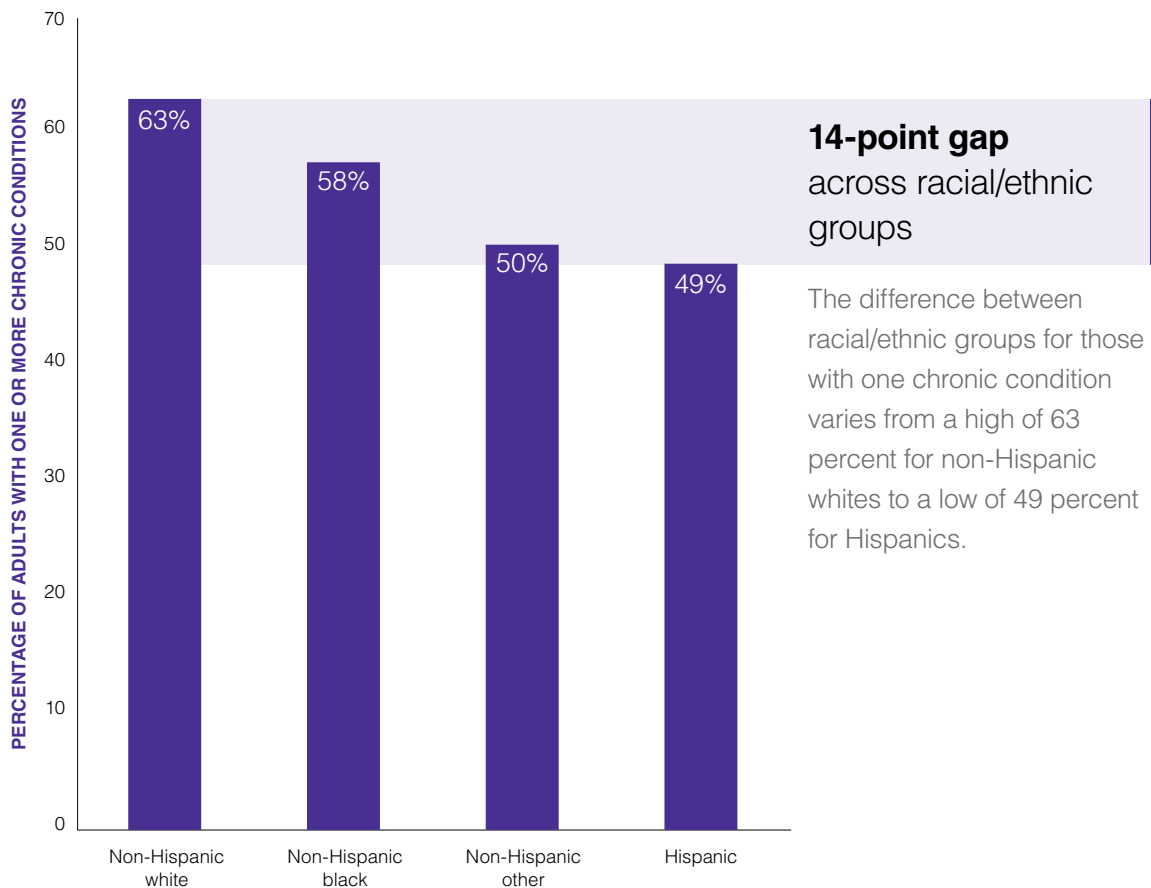
Figure 1.3. Prevalence of Multiple Chronic Conditions by Age and Gender (2014)



Non-Hispanic whites have a higher reported prevalence of chronic conditions than other racial or ethnic groups.

One reason could be that nonwhite racial/ethnic groups have historically had less access to insurance and health care services, making it less likely that their conditions would be diagnosed or treated. The non-white population is also younger; however, we do age-adjust the data.

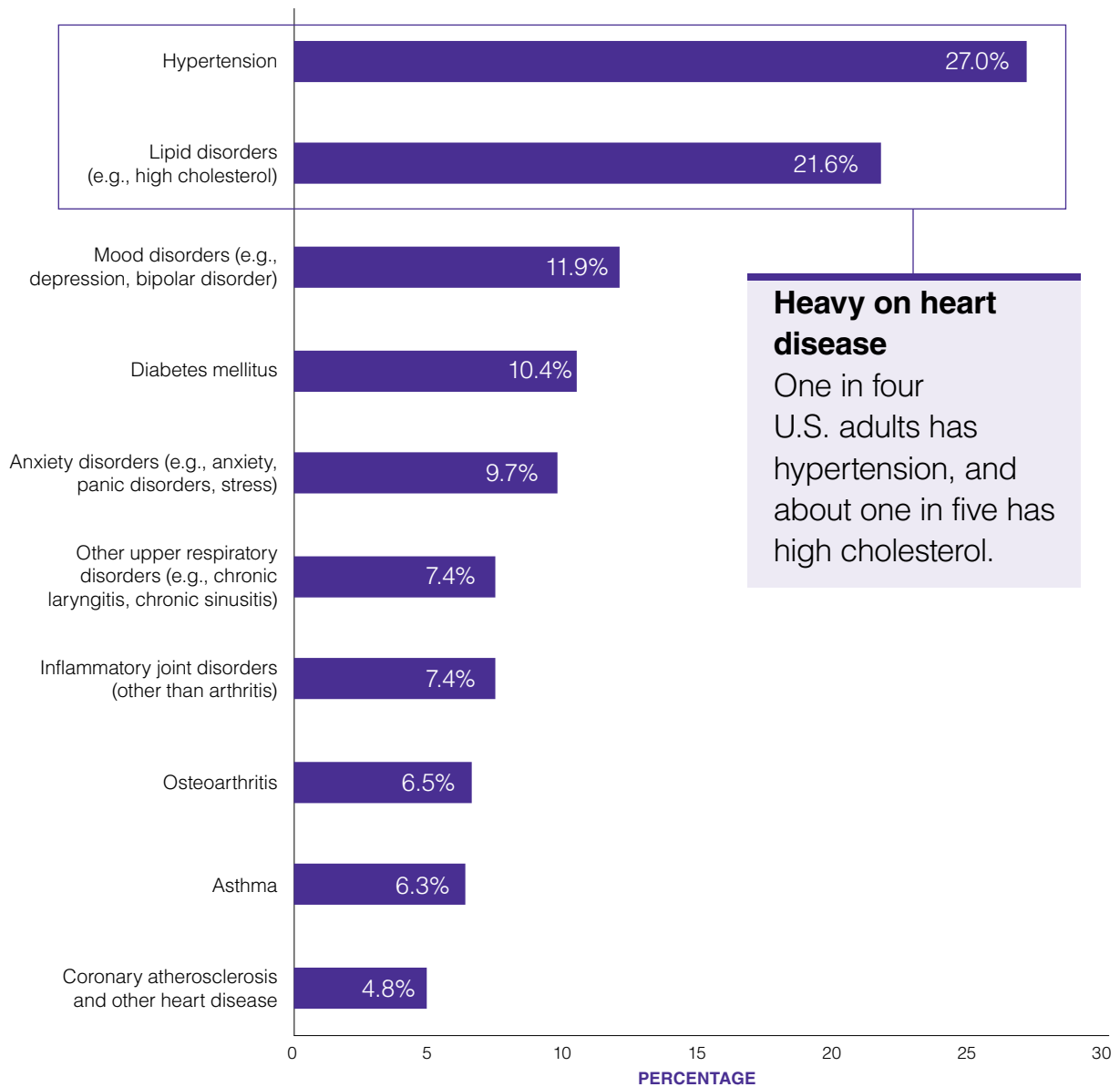
Figure 1.4. Percentage of U.S. Adults with One or More Chronic Conditions by Race/Ethnicity (2014)



NOTE: Estimates have been age-adjusted for the overall U.S. age distribution.

Hypertension and high cholesterol were the most common chronic conditions in 2014.

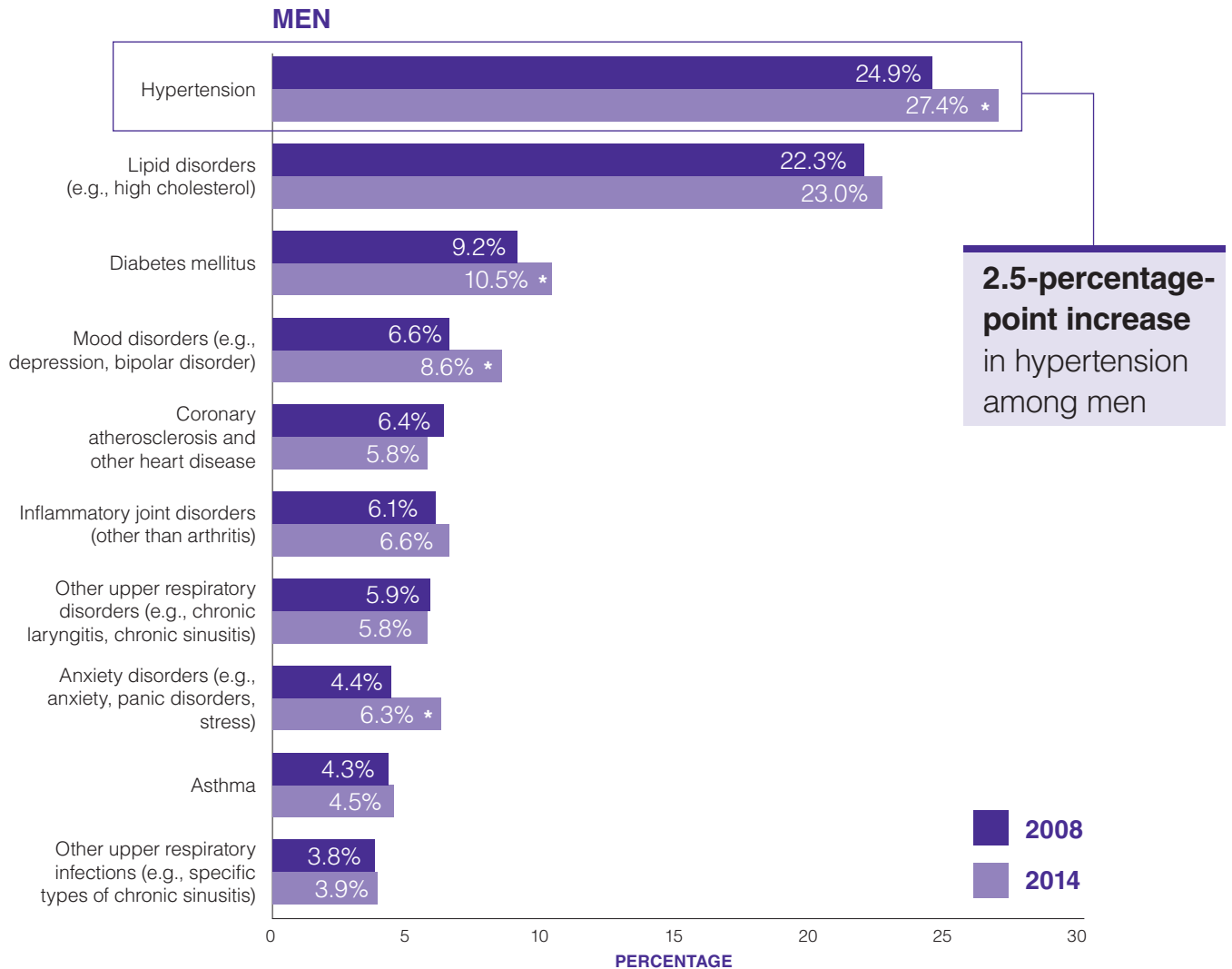
Figure 1.5. Prevalence of Top Chronic Conditions, 2014



For women, the prevalence of anxiety disorders increased the most between 2008 and 2014, while hypertension increased the most for men.

The prevalence of hypertension increased by 2.5 percentage points for men, and anxiety disorders increased by 4.4 percentage points for women. The reported prevalence of mental health conditions also increased from 2008 to 2014.

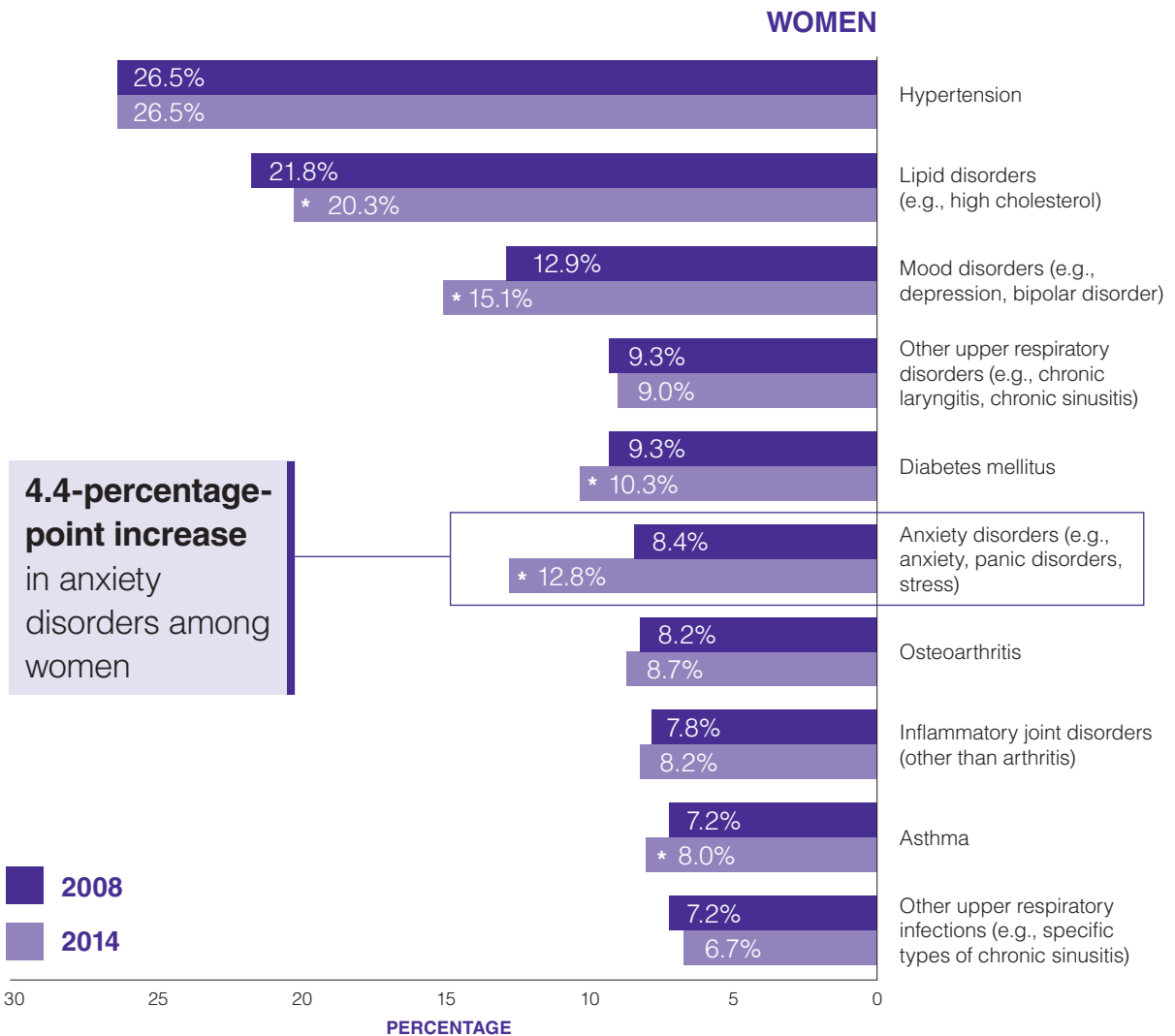
Figure 1.6. Most Common Chronic Conditions in 2008 and 2014, Men



* Differences are significant at the $p < 0.05$ level or below.

From these data, we are unable to determine whether the apparent uptick in reported mental health conditions reflects an increase in diagnosis and reporting (possibly stemming from a decrease in stigma) or an increase in the prevalence of the diseases.

Figure 1.7. Most Common Chronic Conditions in 2008 and 2014, Women



* Differences are significant at the $p < 0.05$ level or below.



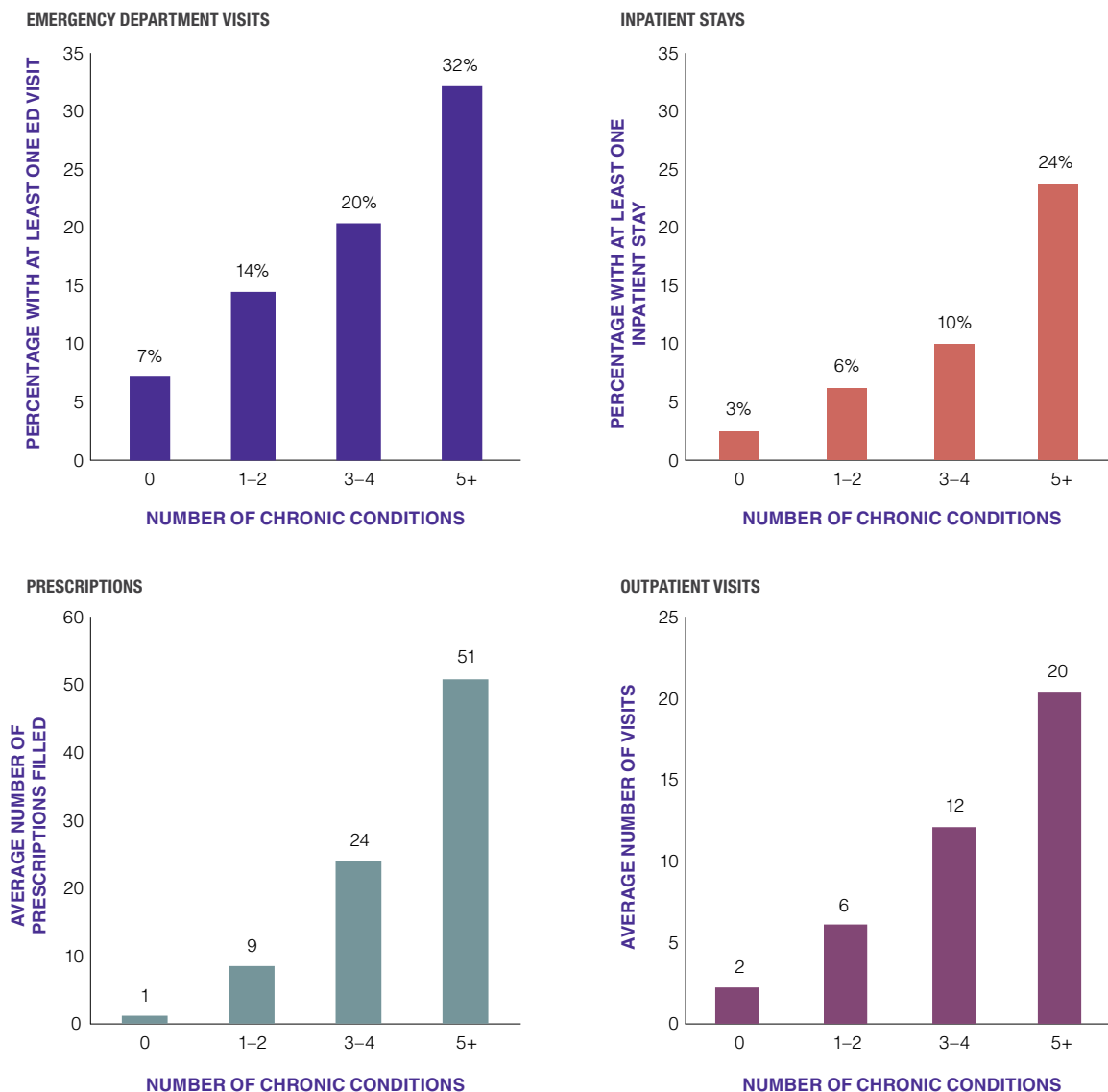
CHAPTER 2

Health Service Use and Spending

Health service use and spending is higher for those with chronic conditions than for those who are healthy.

The more chronic conditions people have, the more they use services of all types. As one example, those with five or more chronic conditions use twice as many drugs on average per year, compared with those with three or four conditions. As another, people with five or more conditions averaged 20 doctor visits per year, compared with 12 visits for those with three or four conditions.

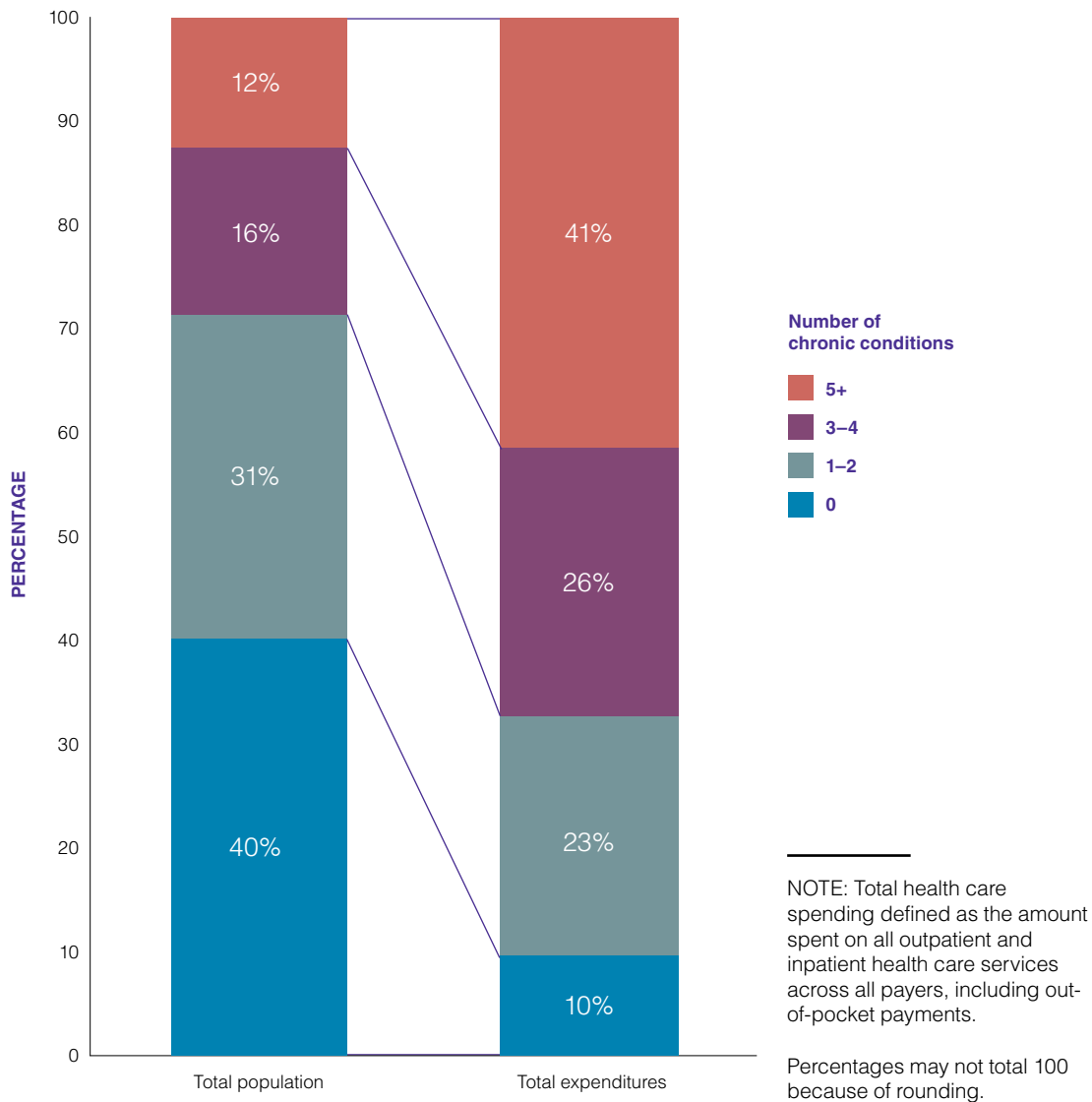
Figure 2.1. Annual Service Utilization by Number of Chronic Conditions (2014)



NOTES: Average utilization is presented; not everyone uses a particular service in a given year, especially inpatient stays and ED visits. The number of prescriptions represents the total number of fills, including refills, not necessarily unique active ingredients, such as acetaminophen or ibuprofen.

Americans with five or more chronic conditions make up 12 percent of the population but account for 41 percent of total health care spending.

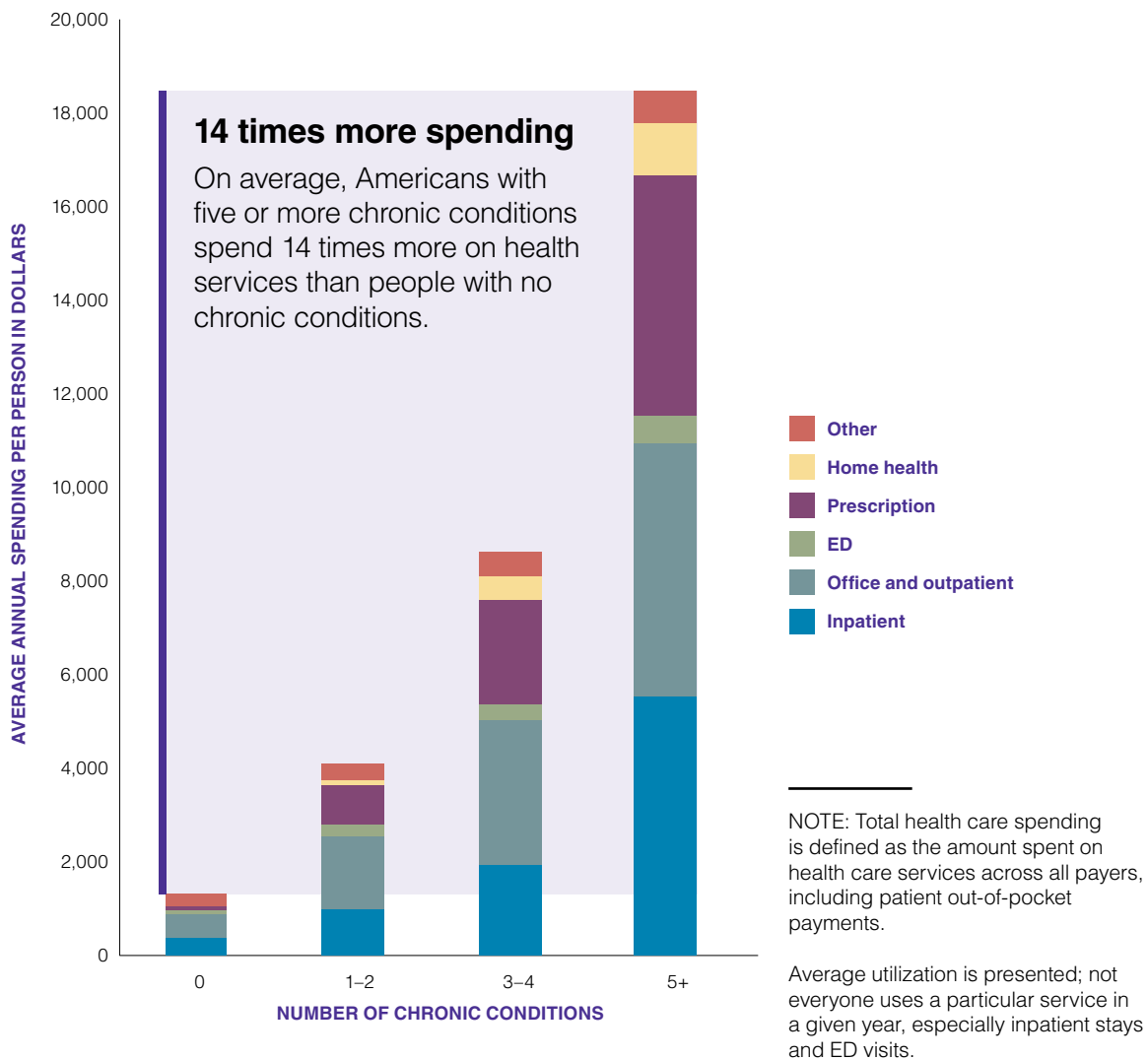
Figure 2.2. Prevalence and Spending by Number of Chronic Conditions (2014)



People with chronic conditions have higher health care spending.

Those with five or more chronic conditions spend twice as much on average as those with three or four conditions, with the majority of that additional spending going to office visits, inpatient visits, and prescriptions.

Figure 2.3. Health Care Spending by Number of Chronic Conditions (2014)



Spending on health care services increases with number of chronic conditions but varies by insurance type.

Figure 2.4 displays payments for health care spending from other payers, such as Medicare or private insurance. An important caveat is that this figure does not account for other social supports to manage chronic conditions, such as unpaid caregiving from family members.

Figure 2.4. Average Annual Health Care Expenditures, by Number of Chronic Conditions and Insurance Type

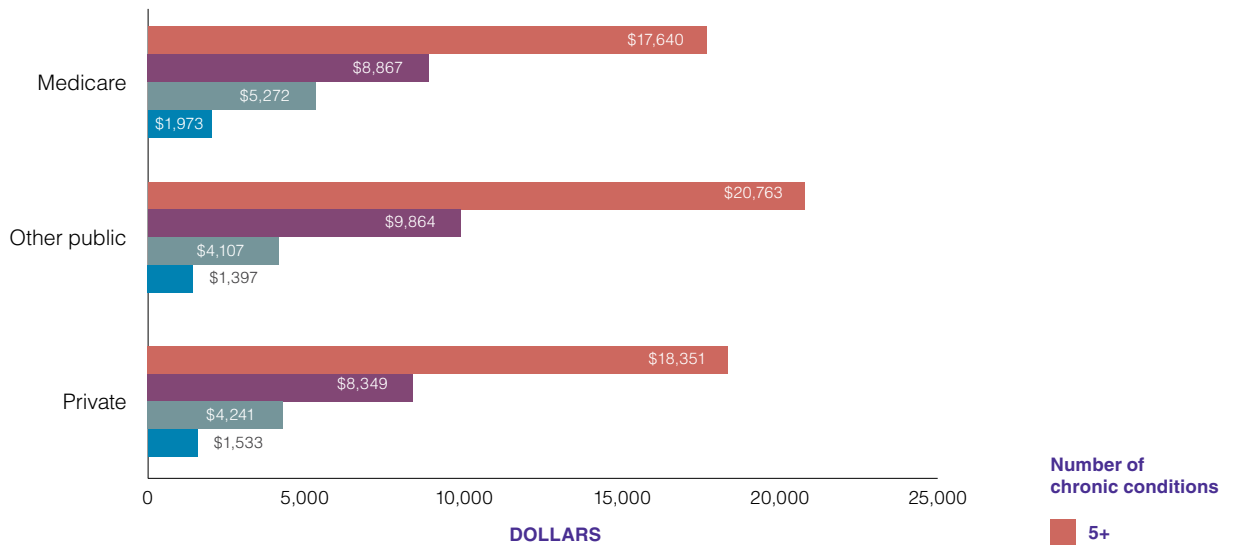
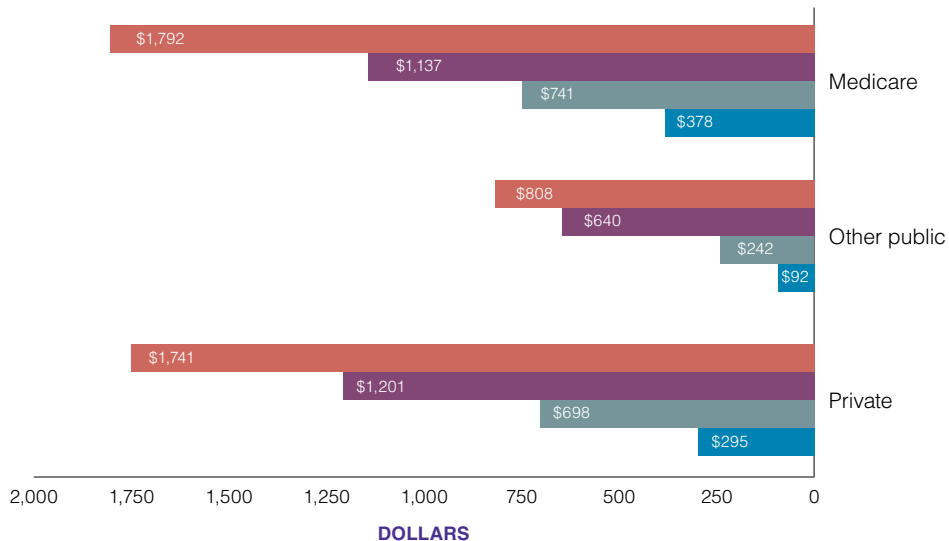


Figure 2.5 Out-of-Pocket Spending by Number of Chronic Conditions and Insurance Type





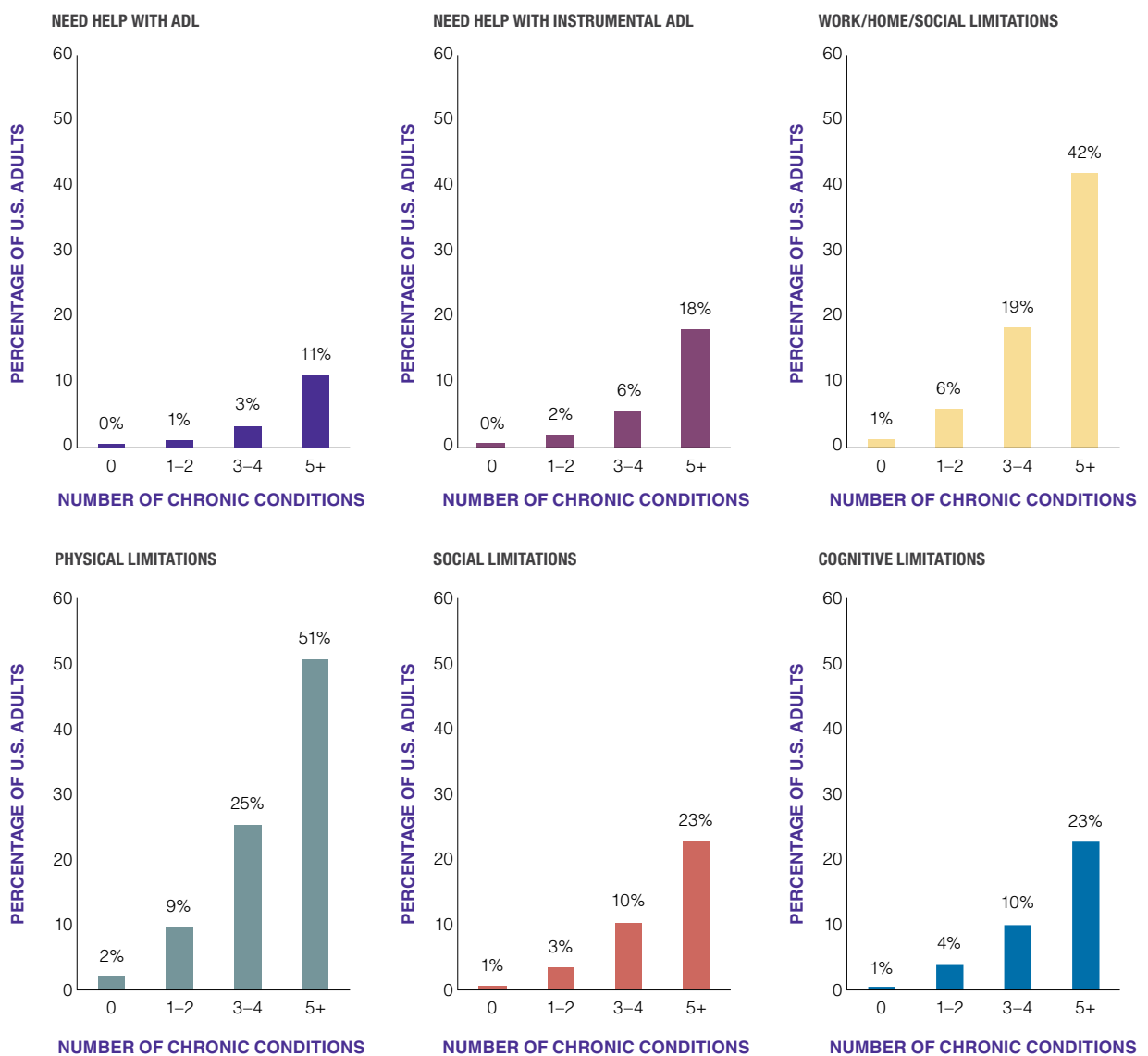
CHAPTER 3

Functional Status of Adults with Multiple Chronic Conditions

Individuals with more chronic conditions have greater difficulties with activities of daily living (ADL) and other social and cognitive functions that are important to patients' independence.

People with five or more conditions have more than double the number of these limitations than those with three or four conditions, and the greater functional limitations place higher demands on caregivers and the health care system.

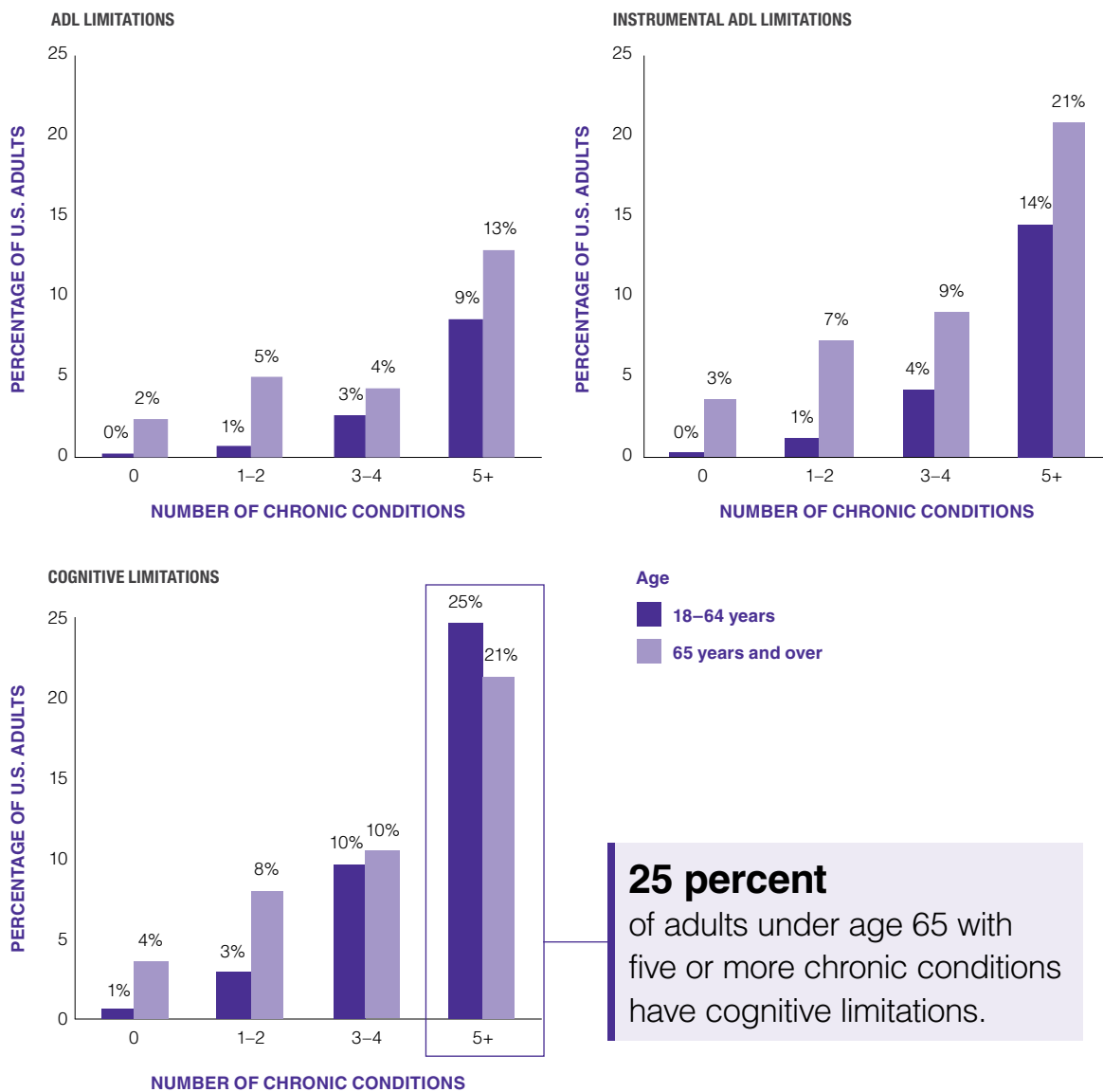
Figure 3.1. Functional, Physical, Social, and Cognitive Limitations, by Number of Chronic Conditions (2014)



NOTES: ADL include such basic functions as being able to bathe, dress, eat, go to the bathroom, or do light activity—for example, walking up a flight of stairs. Instrumental ADL include light housework, preparing meals, paying bills, and shopping. We used the composite variables constructed in MEPS for the ADL and IADL, which indicate whether a person reported needing supervision to complete at least one ADL or instrumental ADL activity. A work/school/home limitation is defined as an impairment or a physical or mental health problem that limits a person's ability to work at a job, do housework, or go to school. A physical limitation is defined as having difficulties walking, climbing stairs, grasping objects, bending, or standing for long periods of time. MEPS defines social limitations as whether a person has trouble participating in social or family activities because of a physical or cognitive impairment. A cognitive limitation exists if the person has trouble with memory, is easily confused, has trouble making decisions, or needs to be supervised for his or her own safety.

Older adults have more limitations on their daily activities and cognitive health than younger people.

Figure 3.2. ADL, Instrumental ADL, and Cognitive Limitations by Age and Number of Chronic Conditions (2014)



Appendix

Detailed Methodology and Limitations

Data and Chronic Condition Identification

We used data from MEPS, a nationally representative survey of U.S. health and health care use administered by AHRQ.¹³ Most charts use data from 2014; charts that compare the change in the treated prevalence of conditions over time use data from 2008 through 2014. We use the term *treated prevalence* to indicate that the data are survey-reported and therefore may underestimate the true prevalence of a given disease. Similar to previous chartbooks, we use the Clinical Classification Software (CCS), which groups individual ICD-9 codes into clinically distinct conditions, such as “essential hypertension,” publicly available from the Healthcare Cost and Utilization Project.¹⁴ Chronic conditions were identified with Dr. Wenke Hwang’s publicly available Chronic Condition Indicator, which was also used for previous chartbooks.^{6, 16, 21} In contrast with the previous chartbook, we did not group together distinct CCS categories. Our results are similar even without grouping together such categories as essential hypertension (CCS 98) and hypertension with complications (CCS 99). A complete listing of ICD-9 codes associated with each CCS category is available from the Healthcare Cost and Utilization Project: <https://www.hcup-us.ahrq.gov/toolssoftware/ccs/AppendixASingleDX.txt>.

For each person, we assigned a chronic condition indicator for the given CCS category if at least one of their ICD-9 codes in the CCS category was labeled as chronic in the Chronic Condition Indicator. This avoided overcounting multiple ICD-9s within the same CCS category. For example, if a person had two ICD-9s within the essential hypertension category (CCS 98), they were only counted as having one chronic condition of hypertension.

Most of the ICD-9s within a given category for the top ten chronic conditions are chronic in the CCI. There are a few, such as other upper respiratory infections, that have a smaller proportion of chronic ICD-9s within the CCS category.

Beginning in 2013, MEPS began masking certain three-digit ICD-9 codes in the medical condition file to protect individuals with rare conditions from possible identification. For a given observation, the CCS code is available, but the ICD-9 codes may be missing. The percentages of masked patient conditions were 6.1 percent in 2013 and 9.2 percent in 2014, as compared with less than 1 percent in 2012. The missing ICD-9s caused drops in the prevalence of certain conditions in 2013 and 2014 compared with previous years, since we were identifying chronic conditions from the ICD-9 level. While most CCS categories are considered entirely chronic or non-chronic, the masking makes it difficult to identify chronic conditions within CCS categories that have a mix of chronic and non-chronic conditions. To impute these masked conditions, we first calculated the percentage of the CCS category that was considered chronic using historical MEPS condition data from 2003 to 2012. We then used the decision rules shown in Table A.1 to determine whether a condition would be deemed chronic or non-chronic.

Table A.1. Decision Rules for Imputing Masked Conditions

Percentage of Cases Within the CCS Category That Were Chronic Conditions in 2003–2012	Number of CCS Categories	Number of Observations (2013)	Number of Observations (2014)	Decision Rule
90–100%	37	2,573	2,651	Chronic
10.1–89.9%	30	612	1,108	Non-chronic
0–10%	76	3,909	6,477	Non-chronic

As a sensitivity analysis, we tested assigning the middle category of cases (10.1 percent to 89.9 percent) to chronic instead of non-chronic. Because of the relatively small sample size of this group, the impact on our outcome measure of an individual's number of chronic conditions was small. For example, the percentage of the population with at least one chronic condition in 2013 was 60.18 percent (if we assigned all middle cases to non-chronic) and 60.45 percent (if we assigned all middle cases to chronic), for a difference of just 0.27 percent. We set middle-category cases to non-chronic to provide a conservative estimate of chronic conditions. The decision rule for this set of CCS categories was then applied across all years of data to ensure the comparability of estimates from one year to the next. Therefore, our estimates may differ slightly from the estimates published in prior chartbooks. The list of CCS categories with missing ICD-9 codes is available from the authors upon request.

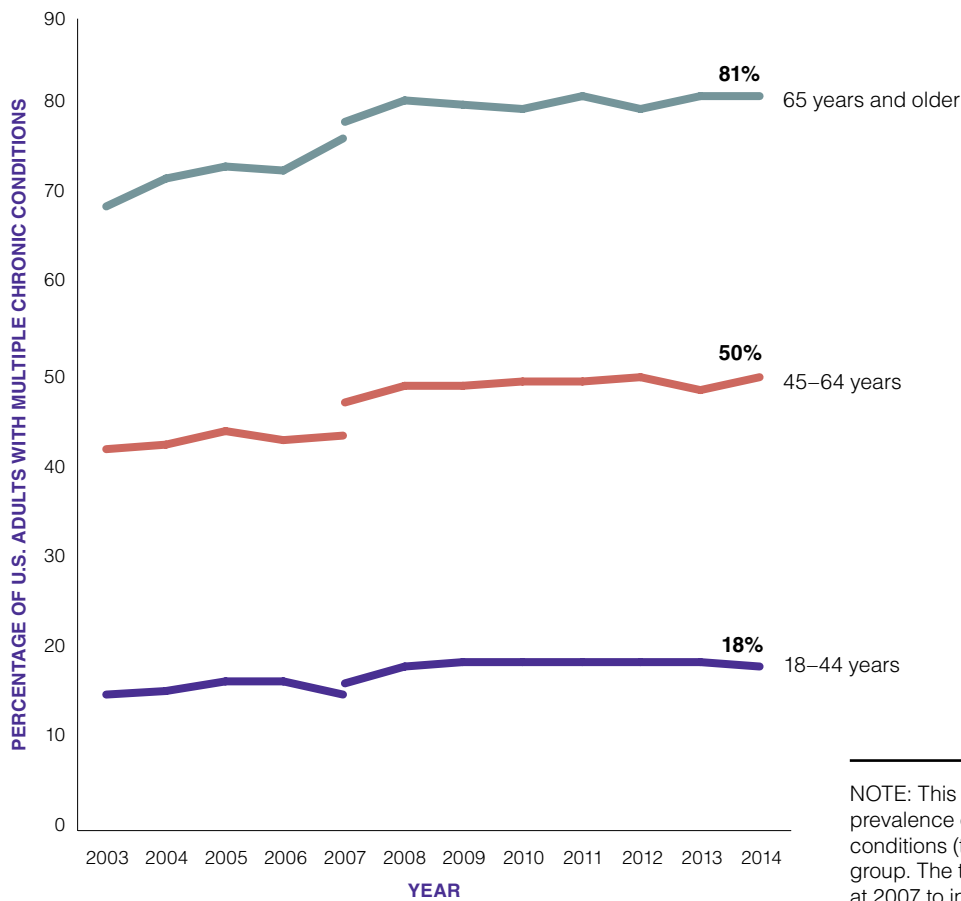
Limitations

While MEPS is one of the best national sources of health care spending and health status, it is important to highlight that it is a survey. As such, the data are potentially biased, particularly when it comes to underreporting health conditions. Because MEPS is a survey, chronic conditions are self-identified; therefore, prevalence estimates from MEPS represent the treated prevalence of a disease, which may be lower than the actual prevalence. As a result, there are notable differences between the treated prevalence for a given condition and the actual prevalence measure in datasets with a laboratory component, such as the National Health and Nutrition Examination Survey (NHANES). For example, the proportion of adults with hypertension in NHANES is 29 percent (2011–2014) versus our estimate of approximately 26 percent for men and women for 2014.²²

Two other limitations of note: The first is that MEPS only surveys civilian and noninstitutionalized Americans. As a result, we are missing the treated prevalence of disease in these groups. However, because the proportion of institutionalized adults is small, this may not markedly affect results. The Medicare Current Beneficiary Survey reports that approximately 3 percent of beneficiaries were in a long-term care facility in 2013.¹⁷ The second limitation is that MEPS likely underreports medical spending by about 17.6 percent, compared with the National Health Expenditures Accounts available from CMS, due to differences in the populations covered and services that are included in the totals and even in service category definitions.¹⁸ These limitations have been documented elsewhere by Bernard et al. (2012),¹⁸ and we highlight them so that readers interpret our results with caution.

As seen in Figure A.1, there is a marked uptick in the treated prevalence of chronic conditions between 2006–2007 and 2007–2008, likely caused by a change in the questionnaire at that time to include a section on “priority conditions,” which directly asks respondents if a doctor has ever told them that they have a given disease. Previously, respondents would have had to volunteer the information. For this reason, we have limited our comparisons over time to 2008–2014.²³

Figure A.1. Prevalence of Multiple Chronic Conditions (2003–2014)

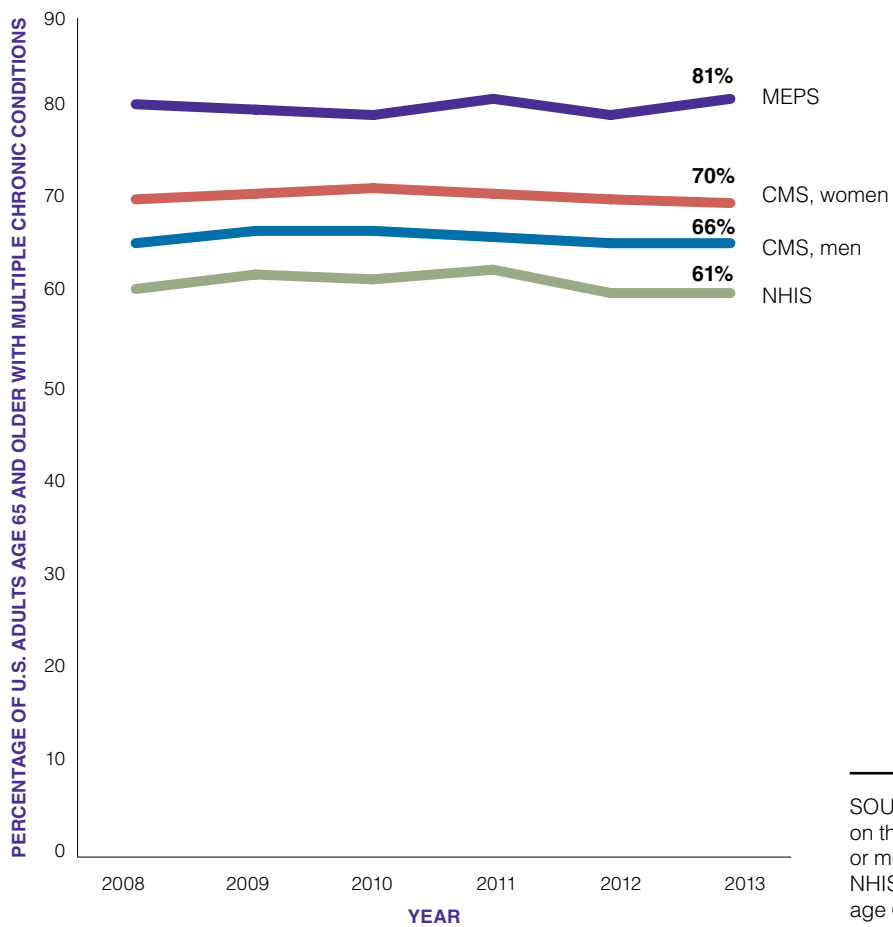


NOTE: This figure documents the prevalence of multiple chronic conditions (two or more) by age group. The trend lines break at 2007 to indicate that MEPS changed its approach to the chronic disease questions.

Comparison of the Trends in Chronic Disease in MEPS to Other Sources

Our estimates of the trend in chronic condition prevalence are flat for the period 2008–2014. This is consistent with other national datasets, notably the Medicare population from data tables of chronic conditions for fee-for-service beneficiaries from the Centers for Medicare & Medicaid Services (CMS) and the National Health Interview Survey (NHIS), both of which are publicly available (Figure A.2).^{24, 25} We did not examine particular individuals over time to determine whether they experienced more chronic conditions. While the prevalence has remained stable over time, the absolute numbers may have increased—particularly for older Americans, as the baby-boomer generation becomes eligible for Medicare.

Figure A.2. Prevalence of Multiple Chronic Conditions in Adults
Age 65 and Older, 2008–2013



Our estimates of the treated prevalence of disease are slightly higher than the CMS estimates for the prevalence of multiple chronic conditions for the population of those age 65 and older and are higher than the NHIS estimates. The differences are likely due to the number of chronic conditions included in the counts. We used the full list of chronic conditions corresponding to the granular CCS categories. The CMS analysis limits its analysis to 19 conditions, and NHIS limits its analysis to ten.

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