

MILLIMAN REPORT

Hospital care for the uninsured in the United States

An analysis of national data sources

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Executive summary

Nationally, the number of uninsured individuals has decreased since the implementation of the Patient Protection and Affordable Care Act (ACA). In 2013, 16.8% of the nonelderly population were uninsured, but this decreased to 10.0% by 2016.^{1,2} However, the uninsured rate has been increasing since 2016. In the second half of 2019, approximately 11% of civilian non-institutionalized U.S. persons (representing 35.7 million people) did not have health insurance coverage, and 15.6% of adults aged 18 to 64 were uninsured.³ Individuals who do not have health insurance are more likely to postpone or do without necessary medical care, which can have long-term consequences for their health.⁴ However, when uninsured individuals do receive care, it may be provided free of charge and classified as “charity care” by the healthcare entity providing the care.

In this paper, we present findings from an analysis of the cost of charity care provided to uninsured individuals by hospitals in the United States, as well as analysis of the demographics of uninsured individuals who receive inpatient hospital care, the services that they receive, and the outcomes of their care.

Based on an analysis of financial information reported by hospitals to the Centers for Medicare and Medicaid Services (CMS), we found that **hospital charity care costs for the uninsured increased approximately 20% over the two-year period of 2016 to 2018, from \$16.3 billion to \$19.6 billion. As a percentage of their total general service costs, hospital charity care costs for the uninsured increased approximately 10% from 2016 to 2018, from 2.37% to 2.62%.**

Further analyzing hospital charity care costs by individual hospital characteristics, we found that:

- **There is significant regional variation in the amount of hospital charity care provided to the uninsured but relative consistency across the nation in that charity care costs for the uninsured have been increasing.** In 2018, hospital charity care costs for the uninsured ranged from a high of 6.8% of total general service costs for hospitals in the West South Central region to a low of 1.1% for hospitals in the New England region.⁵ As a percentage of total general service costs, charity care costs for the uninsured increased in seven of the nine regions analyzed over the period of 2016 to 2018.
- **Hospitals in large urban areas have higher charity care costs for the uninsured than hospitals in more rural areas.** In 2018, charity care costs for the uninsured as a percentage of total general service costs were 3.3% for hospitals in large urban areas, as compared to 2.0% and 1.8% for hospitals in other urban and rural areas.⁶
- **Government hospitals have higher charity care costs for the uninsured than for-profit and non-profit hospitals.** Charity care costs for the uninsured as a percentage of total general service costs were 5.0% for government hospitals, compared to 3.9% for for-profit hospitals and 2.0% for non-profit hospitals in 2018.
- **Hospitals with lower overall hospital quality star ratings from CMS have higher charity care costs for the uninsured than hospitals with higher star ratings.** Charity care costs for the uninsured as a percentage of total general service costs range from a high of 4.3% for one-star hospitals to a low of 1.6% for five-star hospitals.

¹ Tolbert, J, Orgera, K., and Damico, A. (November 2020). Key Facts about the Uninsured Population, Kaiser Family Foundation. Available at <https://www.kff.org/uninsured/issue-brief/key-facts-about-the-uninsured-population/>

² Nonelderly are defined as individuals under the age of 65.

³ Based on data from the January through December 2019 National Health Interview Survey (NHIS). For more information, see Cohen, R., Cha, A., Martinez, M., et al. (September 2020). Health Insurance Coverage: Early Release of Estimates From the National Health Interview Survey, 2019. National Center for Health Statistics. Available at <https://www.cdc.gov/nchs/data/nhis/earlyrelease/insur202009-508.pdf>

⁴ Tolbert, J, Orgera, K., and Damico, A. (November 2020). Key Facts about the Uninsured Population, Kaiser Family Foundation. Available at <https://www.kff.org/uninsured/issue-brief/key-facts-about-the-uninsured-population/>

⁵ See Appendix A for definitions of the regions analyzed.

⁶ Large urban areas are defined as urban areas with populations greater than 1,000,000 people, other urban areas are areas with a population of greater than 50,000 but less than 1,000,000 people, and rural areas are areas with fewer than 50,000 people.

Based on our analysis of the demographics of uninsured persons who received receive inpatient hospital care, the services that they receive, and the outcomes of their care, we found that:

- [A disproportionate share of uninsured persons who were treated in an inpatient hospital setting are Black or Hispanic.](#) Black and Hispanic individuals accounted for 40% of uninsured inpatient discharges, while Black and Hispanic individuals only accounted for 22% of commercial discharges. Conversely, white individuals accounted for 49% of uninsured inpatient discharges, while white individuals accounted for 66% of commercial discharges.
- [Discharges for uninsured persons are more likely to start in an emergency department compared to discharges for individuals with commercial insurance.](#) We found that 76% of discharges for uninsured persons were admitted through the emergency department (ED) compared to only 43% of discharges for individuals with commercial insurance. Our finding of higher rates of admission through the ED for uninsured persons is consistent with other research that has found that uninsured persons are less likely than those with insurance to receive preventive care and services for major health conditions and chronic diseases.⁷
- [Uninsured persons are more frequently treated for acute or emergent reasons compared to individuals with commercial insurance.](#) Two of the top 10 All Patients Refined Diagnosis Related Groups (APR DRGs) with the highest numbers of discharges for uninsured persons were for commonly planned procedures, compared to six of the top 10 APR DRGs for individuals with commercial insurance. As a percentage of total discharges, mental health and substance use disorder, diabetes, and infections were observed to be in the top APR DRGs for uninsured discharges and had the greatest difference compared to commercial discharges. It may be possible that with improved access to routine or preventive care, these conditions could be treated or managed in a less acute setting.^{8,9}
- [Uninsured persons have a higher rate of mortality associated with inpatient hospital stays and are also more likely to leave an inpatient hospital stay against medical advice compared to individuals with commercial insurance.](#) Uninsured individuals have a 58% higher rate of mortality than commercially insured individuals, before adjusting for differences in service and acuity mix. After adjusting for differences in service and acuity mix, uninsured individuals have a 19% higher rate of mortality than commercially insured individuals.

The difference in the proportion of uninsured and commercially insured individuals leaving inpatient hospitals against medical advice is even more striking. Uninsured persons leave inpatient hospitals against medical advice at a rate that is 468% higher than commercially insured individuals. After adjusting for differences in service and acuity mix, uninsured individuals leave inpatient hospital stays against medical advice at a rate that is 161% higher than commercially insured individuals.

More data and analysis of care received by the uninsured population is needed. Gaining a better understanding of key health drivers—such as healthcare access, utilization, and socioeconomic factors—could potentially bring to light insights and opportunities to reduce disparities in care for uninsured individuals.

Introduction to our analysis

There are few publicly available datasets containing healthcare utilization and cost information for uninsured persons. We are not aware of a national data source that provides a complete view of the healthcare services received by the uninsured population, and most state-level all-payer claims datasets do not capture information about the care received by uninsured persons.¹⁰ We are not aware of any existing national data sets that provide a more complete view of healthcare services received by the uninsured population than the sources supporting the analysis described in this paper. As a result, we do not have insight into the services received by uninsured individuals outside of the hospital setting.

⁷ Torbert, Orgera, and Damico, Kaiser Family Foundation, Key Facts about the Uninsured Population. Available at <https://www.kff.org/uninsured/issue-brief/key-facts-about-the-uninsured-population/>

⁸ Department of Health and Human Services, Agency for Healthcare Research and Quality (October 2001). Guide to Prevention Quality Indicators: Hospital Admission for Ambulatory Care Sensitive Conditions. Available at <https://www.ahrq.gov/downloads/pub/ahrqqi/pqguide.pdf>

⁹ Medford-Davis, L., Shah, R., Kennedy, D., and Becker, E. (January 2018). The Role of Mental Health Disease in Potentially Preventable Hospitalizations: Findings From a Large State. Available at <https://pubmed.ncbi.nlm.nih.gov/29189574/>

¹⁰ All-Payer Claims Databases: State Initiatives to Improve Health Care Transparency. Available at: https://www.commonwealthfund.org/sites/default/files/documents/___media_files_publications_issue_brief_2010_sep_1439_love_allpayer_claims_databases_ib_v2.pdf

The costs associated with providing charity care to uninsured individuals are just one component of hospital charity care, as hospitals may also classify services provided to insured individuals as charity care if they meet the hospital's charity care or financial assistance policy. Additionally, charity care is just one component of "uncompensated care," which also includes costs associated with bad or uncollectible debt. For the research presented in this report, we first performed a high-level analysis of the cost of charity care provided by hospitals to uninsured persons in the United States, based on CMS' Healthcare Cost Report Information System (HCRIS) data. We then performed a more detailed analysis of uninsured individuals who received inpatient care and the services that were provided to them using the National Inpatient Sample (NIS) from the Agency for Healthcare Research and Quality (AHRQ).

Lastly, the effects of COVID-19 on health care coverage and charity care costs are not captured in this analysis because the data pre-dates the pandemic. At the time of writing, it appears the rate of uninsured may not have changed significantly during the pandemic because the decline in employer-based health insurance coverage may have been offset by gains in Medicaid coverage.¹¹ An analysis of more recent data will be required to understand the effect of COVID-19 on health care coverage and charity care costs in the United States.

Overview of primary data sources

In this section, we provide a high-level overview of the two primary data sources that we relied on to perform our analyses. More detailed descriptions of these data sources and the methodologies employed to analyze them—including use of secondary data sources—are provided in Appendix A.

HEALTHCARE COST REPORT INFORMATION SYSTEM

The Healthcare Cost Report Information System (HCRIS) is a publicly available database of Medicare cost reports (MCRs) that is compiled and published by CMS. Medicare-certified institutional providers are required to complete and submit MCRs to a Medicare Administrative Contractor (MAC) on an annual basis. The MCRs submitted by hospitals contain basic information about the hospital (e.g., location, number of beds, whether they have an accredited teaching program), utilization data (e.g., number of discharges, bed days, and visits), as well as financial data including information about costs incurred and revenues received. CMS then compiles and publishes the information reported in the MCRs in the HCRIS. The HCRIS data contains information for providers across the United States and can therefore be used to analyze hospital costs at a national level.¹²

For the purposes of this analysis, we rely on cost reports for hospital fiscal years ending (FYE) 2016, 2017, and 2018, which are the most recent full years available at the time we completed our analyses. The information reported related to charity care costs in the HCRIS data does not distinguish between costs incurred in inpatient and outpatient settings. Therefore, we analyze the total charity care costs incurred in both hospital inpatient and outpatient settings.

NATIONAL INPATIENT SAMPLE

The National Inpatient Sample (NIS) is a publicly available database of inpatient hospital claims compiled and published by the Agency for Healthcare Research and Quality (AHRQ). It contains information on more than seven million hospital stays in the United States, representing a 20% stratified sample of community hospital stays from all payers—including Medicare, Medicaid, commercial, and the uninsured. The NIS is designed to produce regional and national estimates of inpatient utilization, access, charges, quality, and outcomes. The NIS is updated annually and has discharge history for 1988 through 2017. The NIS does not include information about inpatient hospital stays at rehabilitation and long-term acute care hospitals.¹³

For the purposes of this analysis, we rely upon 2017 data, which is the most recent data available at the time of our analysis.

¹¹ McDermott, Daniel, Cox, Cynthia, Rudowitz, Robin, Garfield, Rachel. (December 2020). How Has the Pandemic Affected Health Coverage in the U.S.?, Kaiser Family Foundation. Available at <https://www.kff.org/policy-watch/how-has-the-pandemic-affected-health-coverage-in-the-u-s/>

¹² More information about the HCRIS data is available at <https://www.cms.gov/Research-Statistics-Data-and-Systems/Downloadable-Public-Use-Files/Cost-Reports/Hospital-2010-form>

¹³ More information about the NIS is available at <https://www.hcup-us.ahrq.gov/nisoverview.jsp>

Results of data analysis

In this section we first discuss findings related to the cost of hospital charity care for the uninsured in the United States. We then discuss findings related to the uninsured individuals who received inpatient care and the services that were provided to them.

COST OF HOSPITAL CHARITY CARE FOR THE UNINSURED IN THE UNITED STATES

National charity care costs for the uninsured reported by hospitals in the HCRIS for hospital fiscal years ending (FYE) 2016, 2017, and 2018 are \$16.3 billion, \$17.5 billion, and \$19.6 billion, respectively. For the same three years, hospitals reported total general service costs of approximately \$688.5 billion, \$718.7 billion, and \$749.7 billion, respectively. As a percentage of their total general service costs, hospital charity care costs for the uninsured increased approximately 10% over this two-year period, from 2.37% in 2016 to 2.62% in 2018. We illustrate these findings in Figure 1, below.

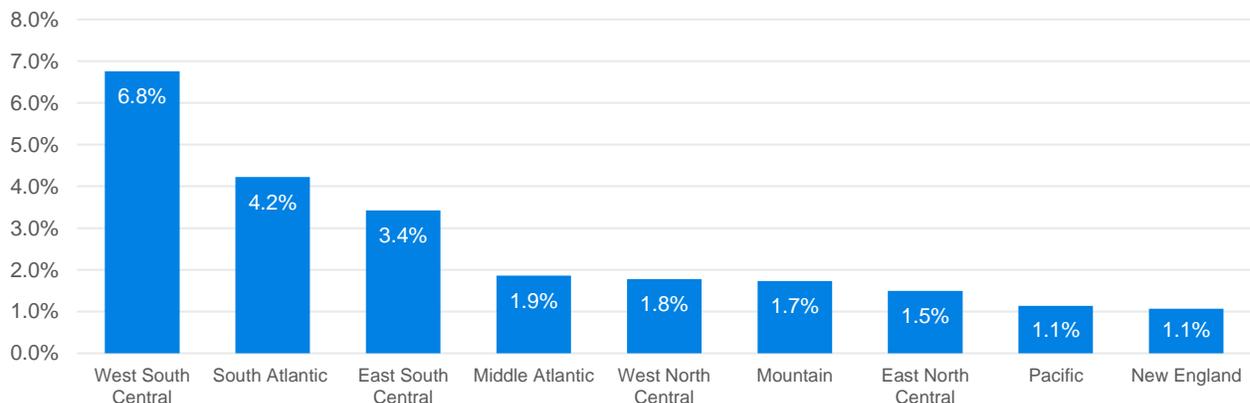
FIGURE 1: HOSPITAL CHARITY CARE COSTS FOR THE UNINSURED IN THE UNITED STATES (FYE 2016 TO 2018)



Charity care costs for the uninsured by region

To better understand how hospital charity care costs for the uninsured vary geographically, we summarized these costs, as reported in the HCRIS for hospital FYE 2018, according to each hospital’s location within nine geographic regions defined in the NIS. Recognizing that there is variation in the size of each region, we present charity care costs as a percentage of total general service costs for each region in Figure 2.

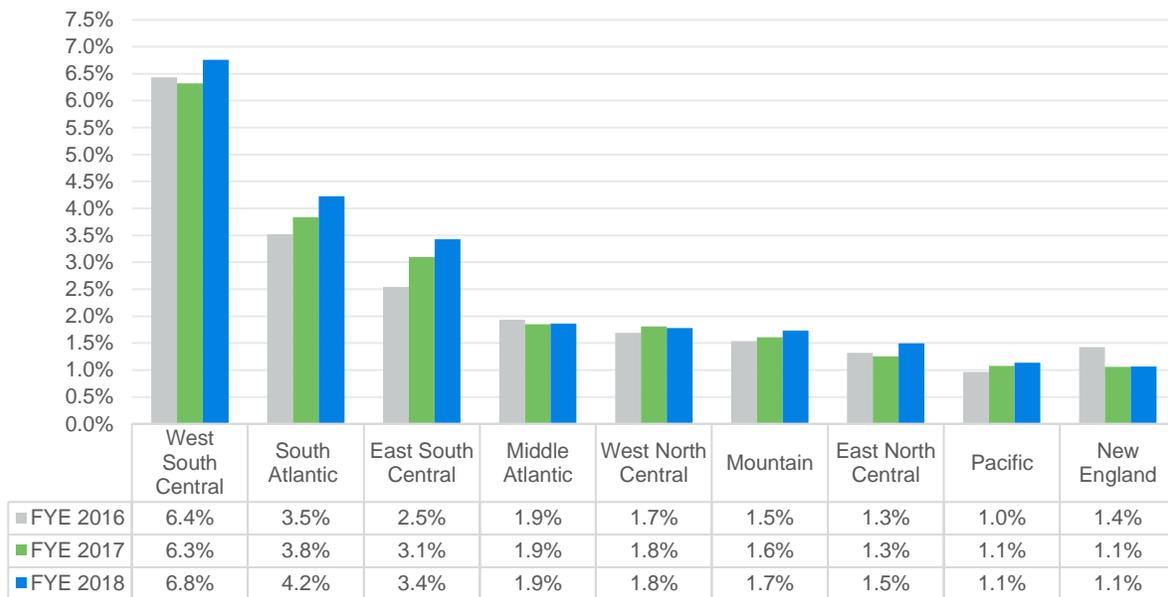
FIGURE 2: VARIATION IN HOSPITAL CHARITY CARE COSTS FOR THE UNINSURED ACROSS REGIONS (FYE 2018)



As shown in Figure 2, the regions with the highest charity care costs for the uninsured relative to total general service costs were West South Central, South Atlantic, and East South Central, at 6.8%, 4.2%, and 3.4%, respectively.

We also analyzed regional trends in charity care costs relative to total general service costs from FYE 2016 to FYE 2018. As shown in Figure 3, charity care costs for the uninsured relative to total general service costs increased over this three-year period in seven of the nine geographic regions analyzed, with only the Middle Atlantic and New England regions experiencing decreases. Furthermore, the rank of each region’s charity care costs relative to total general service costs is consistent across the three years analyzed, with the exception of New England. New England went from having the third-lowest charity care costs relative to total general service costs in FYE 2016 to having the lowest among all of the regions in FYE 2018.

FIGURE 3: TRENDS IN HOSPITAL CHARITY CARE COSTS FOR THE UNINSURED BY REGION (FYE 2016 TO 2018)



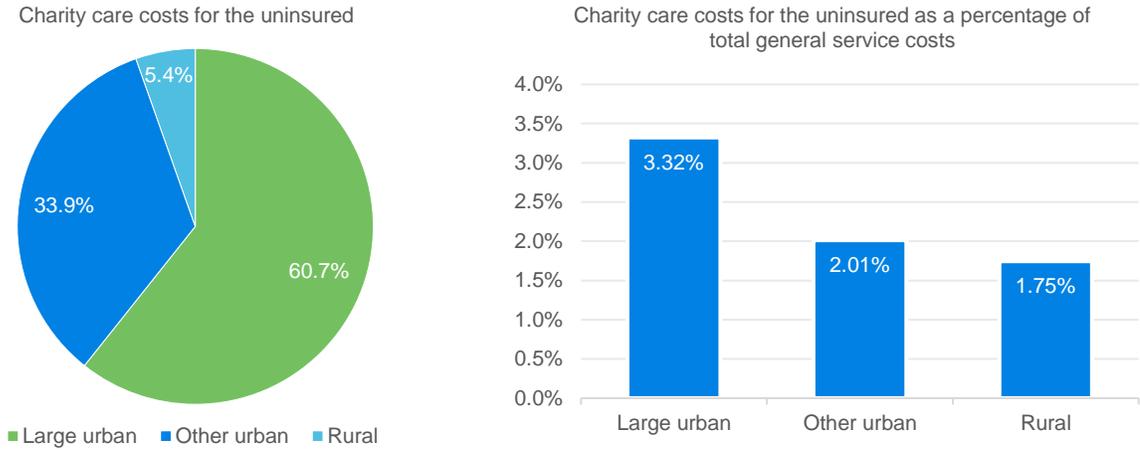
Charity care costs for the uninsured in urban vs. rural areas

We evaluated how charity care costs vary for hospitals located in urban versus rural areas. For the purposes of our analysis, large urban, other urban, and rural areas are defined as follows:

- Large urban areas are defined as urban areas with populations greater than 1,000,000 people.
- Other urban areas are areas with a population of greater than 50,000 people but less than 1,000,000 people.
- Rural areas are areas with fewer than 50,000 people.

As shown in Figure 4, 60.7% of charity care costs for the uninsured were provided at hospitals in large urban areas in FYE 2018. Additionally, charity care costs for the uninsured relative to total general service costs were notably highest for hospitals in large urban areas, at 3.3%, as compared to hospitals in other urban and rural areas, at 2.0% and 1.8%, respectively.

FIGURE 4: VARIATION IN HOSPITAL CHARITY CARE COSTS FOR THE UNINSURED FOR URBAN VERSUS RURAL AREAS (FYE 2018)

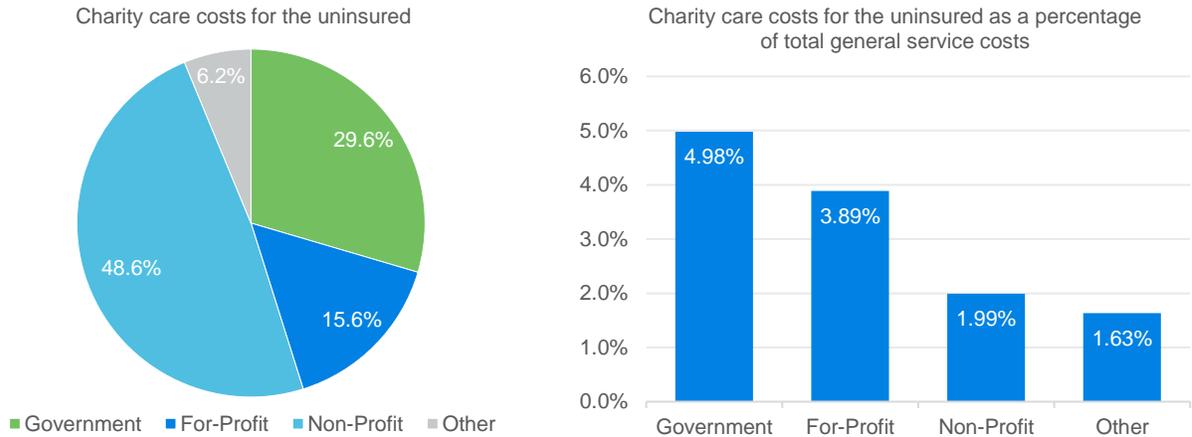


Charity care costs by ownership type

Using ownership information reported in HCRIS, we categorized hospitals as government, non-profit, and for-profit, and summarized charity care costs for the uninsured across these three hospital ownership type categories.

As shown in Figure 5 below, we found that in hospital FYE 2018, non-profit hospitals had the highest total charity care costs for the uninsured, at 48.6% of total, among the different ownership type categories, followed by government hospitals and non-profit hospitals. However, government hospitals had the highest charity care costs for the uninsured as a percentage of total general service costs at 5.0%, compared to 3.9% for for-profit hospitals and 2.0% for non-profit hospitals.

FIGURE 5: VARIATION IN CHARITY CARE COSTS FOR THE UNINSURED BY HOSPITAL OWNERSHIP (FYE 2018)



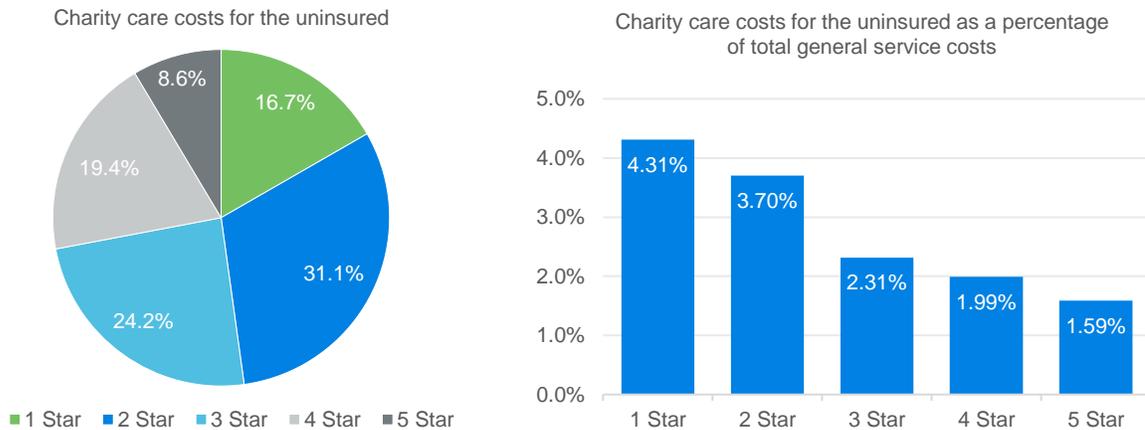
Note: See Appendix A for more information about hospital ownership classifications

Charity care costs by CMS overall hospital quality star rating

We used information from the CMS Hospital Compare website to categorize hospitals by their CMS overall hospital quality star rating. The CMS overall hospital quality star rating summarizes a variety of individual quality measures related to common conditions treated in hospitals and reflects how well each hospital performed on those measures relative to other hospitals. The ratings range from one to five, and a higher number reflects better performance on the quality measures evaluated. Below is displayed the charity care costs for the uninsured for hospitals assigned to a star rating from one to five.

The results of this analysis are shown in Figure 6 below. In FYE 2018, the majority of charity care costs for the uninsured were reported by hospitals with ratings of two or three stars, with approximately 31.1% of total charity care costs reported by hospitals with a two-star rating and 24.2% of total charity care costs reported by hospitals with a three-star rating. As a percentage of total general service costs, hospitals with lower CMS overall hospital quality star ratings reported more charity care costs for the uninsured than hospitals with higher CMS overall hospital quality star ratings. Hospital charity care costs for the uninsured were 4.3% of total general service costs for hospitals with a CMS overall hospital quality star rating of one, while only 1.6% of total general service costs for hospitals with a CMS overall hospital quality star rating of five. This implies that a disproportionate share of charity care for uninsured persons is provided in lower-quality hospitals.

FIGURE 6: VARIATION IN HOSPITAL CHARITY CARE COSTS FOR THE UNINSURED BY CMS OVERALL HOSPITAL QUALITY STAR RATING (FYE 2018)



A comparison of the HCRIS and NIS data sources

As described in the section above, the information available in HCRIS along with supplemental data sources are useful for analyzing costs in the aggregate, by location, or by other facility characteristics (e.g., by urban/rural, ownership type, or overall hospital quality star rating). However, HCRIS does not contain information about the populations receiving care, their medical conditions, or the outcomes of their care. Therefore, to develop a deeper understanding about the uninsured who receive hospital care, we used the 2017 NIS dataset. To evaluate the consistency between the HCRIS and NIS data sources, we compared:

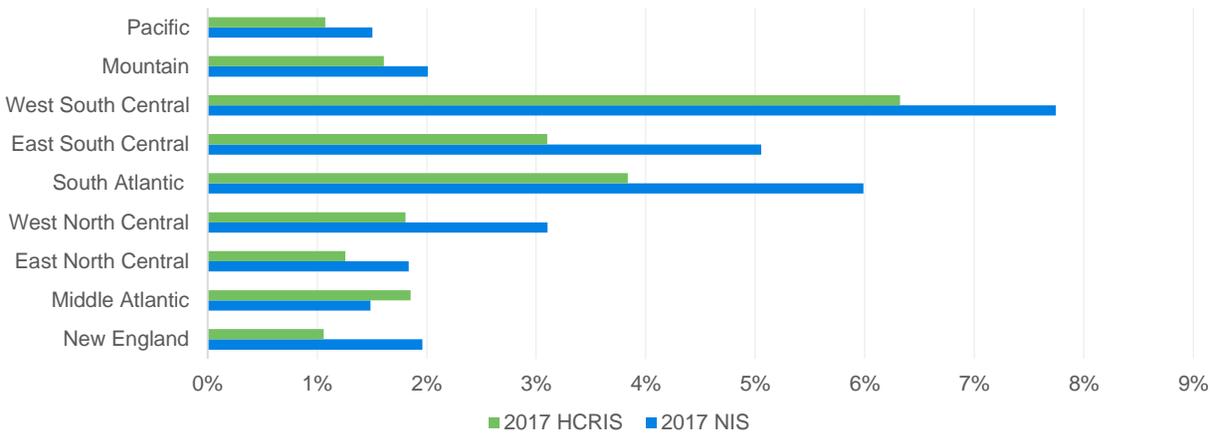
- Total (inpatient and outpatient) hospital charity care costs for the uninsured as a percentage of total general service costs from the 2017 HCRIS data
- Inpatient hospital charges for the uninsured as a percentage of inpatient hospital charges for all populations from the 2017 NIS

There are a few notable differences between these two measures:

1. HCRIS includes both inpatient and outpatient services, while the NIS includes only inpatient services.
2. Using HCRIS, we analyze charity care costs for the uninsured; using the NIS, we analyze charges for the uninsured (this includes discharges categorized as self-pay or as no charge).
3. The NIS excludes rehabilitation and long-term acute care hospitals, while the HCRIS includes these hospital types.

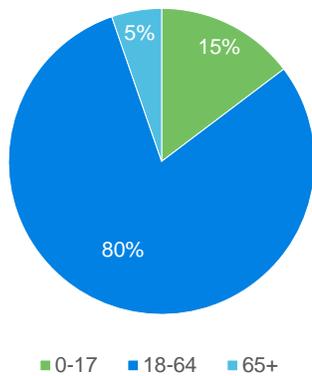
With respect to the second difference noted above, we note that the services classified as charity care for the uninsured will be a subset of the total services provided to the uninsured. As shown in Figure 7, our comparison of these two data sets indicates that they are directionally consistent, with the inpatient services classified as “uninsured” in the NIS representing a higher percentage of total inpatient services relative to the percentage of combined inpatient and outpatient hospital service costs classified as “charity care for the uninsured” in HCRIS.

FIGURE 7: COMPARISON OF HCRIS HOSPITAL CHARITY CARE COSTS FOR THE UNINSURED AS A PERCENTAGE OF TOTAL GENERAL SERVICE COSTS VS. NIS INPATIENT CHARGES FOR THE UNINSURED AS A PERCENTAGE OF INPATIENT HOSPITAL CHARGES FOR ALL POPULATIONS



NATIONAL COMPARISON OF INPATIENT HOSPITAL CARE FOR THE UNINSURED VERSUS COMMERCIALY INSURED

FIGURE 8: UNINSURED DISCHARGES BY AGE



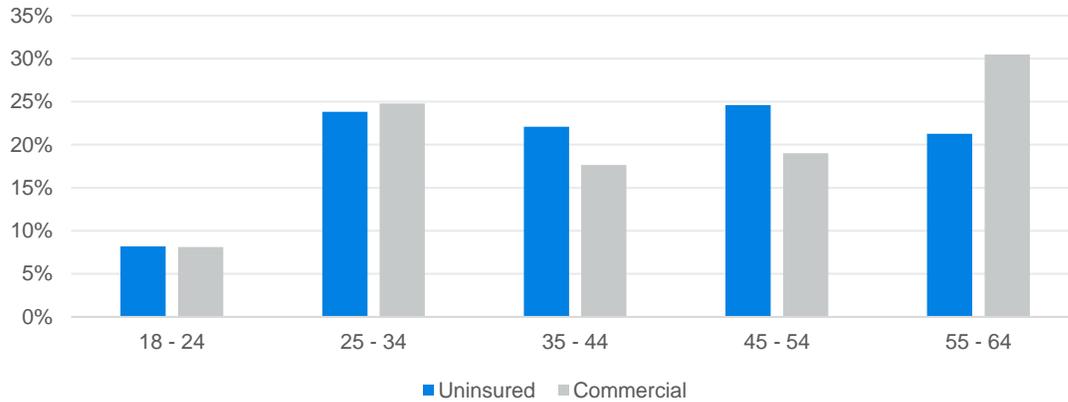
In this section, we further analyze the demographic characteristics, medical conditions, and outcomes of care for the uninsured receiving inpatient hospital care. The vast majority of discharges for the uninsured were for persons between the ages of 18 and 64, as seen in Figure 8. Individuals below the age of 18 and over the age of 65 are a small portion of the total because children and adolescents are more likely to have access to Medicaid coverage (e.g., CHIP programs), and individuals over age 65 typically have access to Medicare coverage. For this reason, we limited our analysis of the uninsured population to adults 18 to 64 years old for the analysis described in this section of our report.

In this section, we used the NIS dataset to provide insight into uninsured persons receiving care at inpatient hospitals and compare their characteristics with commercially insured individuals receiving inpatient hospital care.

Patient demographic characteristics (limited to ages 18 to 64)

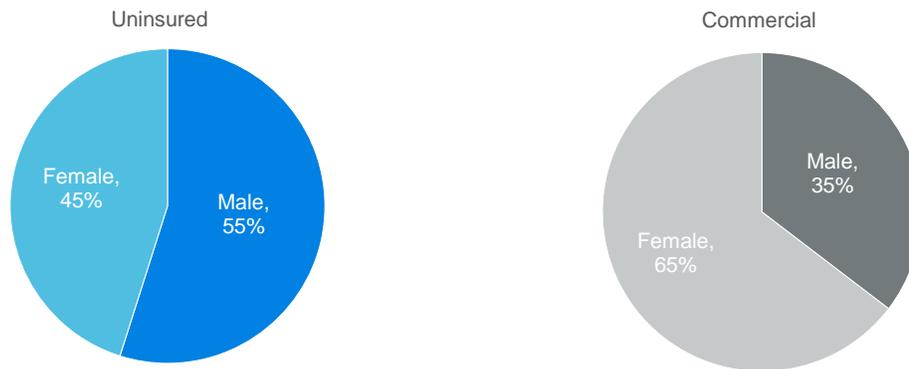
Figures 9 and 10 compare the age and gender distributions of discharges for uninsured and commercially insured individuals. There is a consistent proportion of discharges for uninsured and commercially insured individuals who are ages 18 to 34, a higher proportion of uninsured discharges for individuals who are ages 35 to 44 (22% of uninsured vs. 18% of commercial) and also between ages 45 and 54 (25% of uninsured vs. 19% of commercial). However, there is a lower proportion of uninsured discharges for individuals who are ages 55 to 64 (21% of uninsured vs. 30% commercial). Discharges for uninsured persons are 55% male compared to just 35% male for commercially insured persons.

FIGURE 9: AGE DISTRIBUTION OF INDIVIDUALS WITH UNINSURED AND COMMERCIALY INSURED DISCHARGES



Note: Limited to ages 18 to 64.

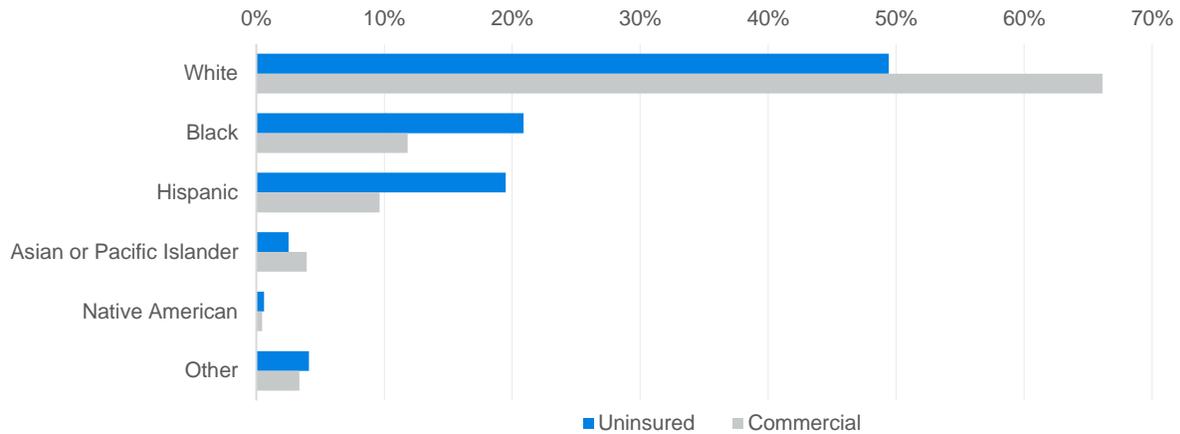
FIGURE 10: GENDER DISTRIBUTION OF INDIVIDUALS WITH UNINSURED AND COMMERCIALY-INSURED DISCHARGES



Note: Limited to ages 18 to 64.

Figure 11 compares the distribution of race for individuals with uninsured and commercially insured discharges. Black and Hispanic individuals experience a larger proportion of uninsured discharges than commercial discharges. Black and Hispanic individuals accounted for 40% of uninsured inpatient discharges, while Black and Hispanic individuals only accounted for 22% of commercial discharges. Conversely, white individuals accounted for 49% of uninsured inpatient discharges, while white individuals accounted for 66% of commercial discharges.

FIGURE 11: RACE DISTRIBUTION OF INDIVIDUALS WITH UNINSURED AND COMMERCIALY INSURED DISCHARGES



Note: Does not sum to 100% because exhibit excludes "unknown" (4-6% of discharges). Limited to ages 18 to 64.

Figure 12 compares the proportion of discharges with admission through the emergency department (ED). Uninsured discharges have a higher portion with admission through the ED (76%) compared to commercially insured discharges (43%).

FIGURE 12: DISCHARGES THAT BEGAN IN THE EMERGENCY DEPARTMENT



Note: Limited to ages 18 to 64.

Figure 13 compares the top service types for uninsured and commercially insured discharges. The top six service types make up approximately 85% of uninsured and commercially insured discharges. General medicine and mental health and substance abuse account for 54% of uninsured discharges, compared to 30% of commercially insured discharges. Obstetrics is the most frequently utilized service for commercially insured individuals (28%).

FIGURE 13: TOP SERVICE TYPES AND PERCENT OF TOTAL DISCHARGES

CHARITY CARE TOP DRG SERVICE LINES	% OF DISCHARGES	COMMERCIAL TOP DRG SERVICE LINES	% OF DISCHARGES
General Medicine*	41%	Obstetrics	28%
Mental Health and Substance Abuse	13%	General Medicine*	25%
General Surgery	9%	Orthopedics	10%
Obstetrics	9%	General Surgery	10%
Cardiology	8%	Cardiology	6%
Neurology	5%	Mental Health and Substance Abuse	5%

Note: Limited to ages 18 to 64; General Medicare is a broad category of DRGs including endocrinology, gastroenterology, hematology, infectious disease, nephrology, pulmonary, and rheumatology, among other services.

Comparison of top services based on 3M™ All Patient Refined Diagnosis Related Group (APR DRG) classifications for uninsured discharges versus commercially insured discharges

Below are three figures containing comparisons of the top services provided based on APR DRG classifications for uninsured discharges versus commercially insured discharges, ranked by the base APR DRGs with the largest number of discharges. Appendix B also contains an expanded exhibit of the top 25 APR DRGs for uninsured and commercial discharges.

The APR DRGs that were most common for uninsured discharges were nearly always emergent. For six out of the top 10 APR DRGs for uninsured discharges, more than 85% of admissions were through the ED. Similarly, for 17 out of the top 25 APR DRGs for uninsured discharges, over 85% of admissions were through the ED. For commercial discharges, only two out of the top 10, and only four out of the top 25 APR DRGs had over 85% of admissions through the ED. Additionally, for all APR DRGs that are within the top 25 for both uninsured and commercial discharges, the uninsured always had a higher proportion of admissions through the ED.

Except for vaginal and cesarean deliveries, the top 10 APR DRGs for the uninsured were not for commonly planned procedures. Comparatively, six of the top 10 APR DRGs for the commercial discharges were for services that are typically planned, including two orthopedic (joint replacement) APR DRGs, three obstetric (vaginal and cesarean deliveries) APR DRGs, and a “Procedures for Obesity” APR DRG. Additionally, many of the APR DRGs with the greatest proportional difference between uninsured and commercial discharges are for conditions where inpatient hospitalizations could potentially be avoided through improved care management in a primary care setting or with use of prescription drugs. Examples include “Diabetes,” “Cellulitis and Other Skin Infections,” “Septicemia and Disseminated Infections,” “Major Depressive Disorders and Other/Unspecified Psychoses,” and “Alcohol Abuse and Dependence” APR DRGs.

FIGURE 14: TOP 10 APR DRGS FOR UNINSURED DISCHARGES, RANKED BY PERCENTAGE OF DISCHARGES

TOP APR DRGS FOR UNINSURED DISCHARGES	UNINSURED		COMMERCIAL	
	% OF TOTAL DISCHARGES	% ADMITTED THROUGH ED	% OF TOTAL DISCHARGES	% ADMITTED THROUGH ED
Septicemia & Disseminated Infections	5.1%	91%	3.3%	86%
Vaginal Delivery	4.9%	15%	16.3%	10%
Diabetes	3.0%	93%	1.0%	88%
Cellulitis & Other Skin Infections	3.0%	91%	1.2%	80%
Major Depressive Disorders & Other/Unspecified Psychoses	2.9%	61%	1.6%	51%
Alcohol Abuse & Dependence	2.8%	84%	0.8%	75%
Disorders of Pancreas Except Malignancy	2.2%	91%	1.1%	85%
Cesarean Section without Sterilization	2.1%	12%	7.5%	7%
Heart Failure	2.0%	91%	0.9%	83%
Cholecystectomy	1.8%	90%	1.2%	80%

Note: Limited to ages 18 to 64

FIGURE 15: TOP 10 APR DRGS FOR COMMERCIAL DISCHARGES, RANKED BY PERCENTAGE OF DISCHARGES

TOP APR DRGS FOR COMMERCIAL DISCHARGES	UNINSURED		COMMERCIAL	
	% OF TOTAL DISCHARGES	% ADMITTED THROUGH ED	% OF TOTAL DISCHARGE	% ADMITTED THROUGH ED
Vaginal Delivery	4.9%	15%	16.3%	10%
Cesarean Section without Sterilization	2.1%	12%	7.5%	7%
Septicemia & Disseminated Infections	5.1%	91%	3.3%	86%
Knee Joint Replacement	0.2%	1%	3.1%	1%
Hip Joint Replacement	0.3%	20%	2.0%	3%
Major Depressive Disorders & Other/Unspecified Psychoses	2.9%	61%	1.6%	51%
Procedures for Obesity	0.6%	0%	1.6%	1%
Cesarean Section with Sterilization	0.3%	8%	1.3%	6%
Cholecystectomy	1.8%	90%	1.2%	80%
Cellulitis & Other Skin Infections	3.0%	91%	1.2%	80%

Note: Limited to ages 18 to 64

FIGURE 16: TOP 10 APR DRGS RANKED BY GREATEST ABSOLUTE DIFFERENCE OF PERCENTAGE OF DISCHARGES

APR DRGS WITH GREATEST ABSOLUTE DIFFERENCE: UNINSURED VS. COMMERCIAL	UNINSURED: % OF TOTAL DISCHARGES	COMMERCIAL: % OF TOTAL DISCHARGES	DIFFERENCE (UNINSURED MINUS COMMERCIAL)
Vaginal Delivery	4.9%	16.3%	-11.4%
Cesarean Section without Sterilization	2.1%	7.5%	-5.5%
Knee Joint Replacement	0.2%	3.1%	-2.9%
Alcohol Abuse & Dependence	2.8%	0.8%	2.0%
Diabetes	3.0%	1.0%	2.0%
Hip Joint Replacement	0.3%	2.0%	-1.8%
Cellulitis & Other Skin Infections	3.0%	1.2%	1.8%
Septicemia & Disseminated Infections	5.1%	3.3%	1.8%
Major Depressive Disorders & Other/Unspecified Psychoses	2.9%	1.6%	1.3%
Disorders of Pancreas Except Malignancy	2.2%	1.1%	1.1%

Note: Limited to ages 18 to 64

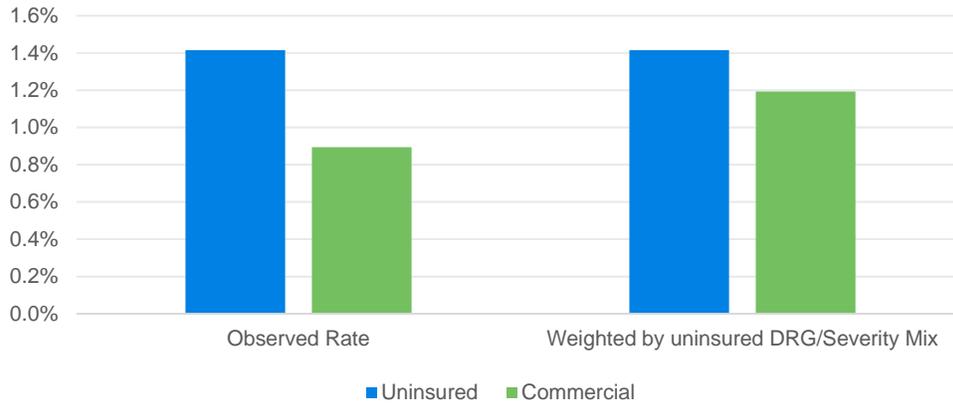
Comparison of patient discharge status

We analyzed the proportion of discharges due to mortality or due to patients leaving against medical advice. Rates were compared between uninsured and commercial discharges for each APR DRG—accounting for both the base APR DRGs and severity of illness (SOI) levels assigned by the 3M™ APR DRG classification system. Figures 17 and 18 below display the observed rates (no adjustments), and the rates weighted by the distribution of APR DRGs for the uninsured. The purpose of the weighting is to adjust for differences in service and acuity mix between the two populations when comparing rates of mortality and patients leaving against medical advice.

We observed that uninsured individuals have a higher rate of mortality than commercially insured individuals, both before and after adjusting for differences in service and acuity mix. The unadjusted rates of mortality are 1.4% for uninsured discharges and 0.9% for commercial discharges (a 0.5% difference). After adjusting for differences in service and acuity mix, we observe a smaller difference, with a 0.2% difference when weighted by the uninsured distribution of APR DRGs.

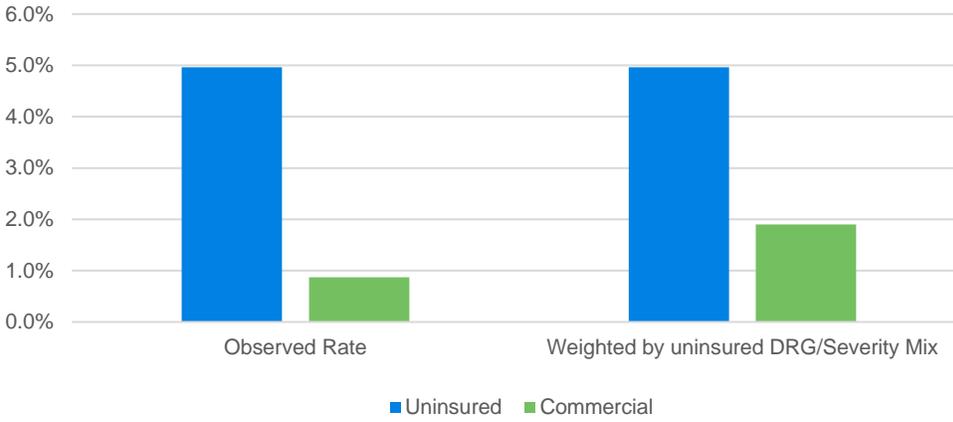
The difference between uninsured and commercial discharges is even more striking for the proportion who left against medical advice. Before adjusting for service and acuity mix, we observed that uninsured persons were five times more likely to be discharged from the hospital against medical advice (5% of discharges) compared to commercially insured individuals (0.9% of discharges). After adjusting for service and acuity mix, we observe that the difference between the two lines of business is still fairly large, with a 3.1% difference when weighted by the uninsured distribution of APR DRGs.

FIGURE 17: PROPORTION OF DISCHARGES DUE TO DEATH



Note: Limited to ages 18 to 64

FIGURE 18: PROPORTION OF DISCHARGES DUE TO PATIENT LEAVING AGAINST MEDICAL ADVICE



Note: Limited to ages 18 to 64

Conclusion

Nationally, hospital charity care costs for the uninsured as a percentage of total general service costs have increased by approximately 10% from 2016 to 2018. While there is relative regional consistency, in that hospital charity care costs have been increasing over this period, there is significant regional variation in the amount of hospital charity care costs for the uninsured. Additionally, as a percentage of total general service costs, charity care costs for the uninsured are highest in large urban areas, at government hospitals, and at hospitals with lower CMS overall hospital quality star ratings.

Nearly twice as many uninsured persons with inpatient hospital discharges were Black or Hispanic as compared to commercially insured individuals with inpatient hospital discharges. Inpatient hospital services received by uninsured persons were more often emergent, with 66% of uninsured discharges admitted through the ED. Most of the top APR DRGs for uninsured individuals receiving inpatient hospital care were for acute and unplanned reasons, including mental health and substance use disorder, diabetes, and infections. Uninsured persons left inpatient hospital care against medical advice at a higher rate than commercially insured individuals and had a slightly higher rate of mortality than commercially insured individuals. The findings outlined in this report align with other research that indicates uninsured persons are more likely to postpone or fail to receive needed medical care, more likely to enter the health care system in poorer health, more likely to have worse health outcomes, and more likely to rely on more expensive ED care.^{14,15}

More data is needed to better understand this marginalized population and address the disparities in care that exist for the uninsured.

Acknowledgements

The authors gratefully acknowledge our colleagues who have contributed to this white paper, including Anne Jackson for coordinating and guiding the research presented in this report, Dayton Jennings for his significant contributions to the analysis, and Andrew Naugle and Andrew Gaffner for their peer review.

Limitations

In performing this analysis, we relied on publicly available resources and research. We have not audited or verified this data and other information. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete.

We performed a limited review of the data used directly in our analysis for reasonableness and consistency, and we have not found material defects in the data. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of our analysis.

The authors Jessica Naber and Luke Metz are members of the American Academy of Actuaries, and meet the qualification standards for performing the analyses presented in this report.

¹⁴ Hadley, Jack (2006). Cover Missouri Project: Report 1. Consequences of the Lack of Health Insurance on Health and Earnings. The Urban Institute for The Missouri Foundation for Health. Available at: <https://www.urban.org/sites/default/files/publication/50321/1001001-Consequences-of-the-Lack-of-Health-Insurance-on-Health-and-Earnings.PDF>

¹⁵ National Council for Community Behavioral Healthcare (June 2007). The Uninsured: The Impact of Covering Mental Illness and Addictions Disorders. Available at: <https://www.thenationalcouncil.org/wp-content/uploads/2012/12/CoveringTheUninsured.pdf?daf=375ateTbd56>

Appendix A: Additional data analysis details

HCRIS ANALYSIS ASSUMPTIONS, METHODOLOGIES, AND LIMITATIONS

For the purposes of our analyses, we relied upon several worksheets from the MCR. First, we relied on information from worksheet S-10 of the MCR, which reports information about uncompensated and indigent care, including the cost of charity care provided, both to uninsured and to insured individuals. We also relied upon worksheet B Part I of the MCR for each provider's total cost for providing services. In pulling the general service costs from this schedule, we include the medical education costs (i.e., intern and resident costs) reported by the hospital.

Note that while the HCRIS contained some FYE 2019 cost reports, cost reports for hospital FYE 2019 were not yet complete at the time we performed our analysis. Therefore, we did not rely on hospital FYE 2019 cost reports.

Below are several limitations associated with the MCR data that may affect the results represented in this report:

- Hospitals generally submit their MCR based on their facility's fiscal year. For example, one provider's fiscal year may begin on January 1 of a specific year and end on December 31 of that year, while another provider's fiscal year may begin on July 1 of a specific year and end on June 30 of the following year. As a result, the data available does not align to the same dates. Due to this limitation, in our analysis of the HCRIS data we aggregate the data based on each cost report's end date (generally the same as the fiscal year end date, or FYE, of the facility). For example, our FYE 2017 analyses will include any MCRs that have a reported FYE date in calendar year 2017.
- The S-10 worksheet of the MCR data does not contain information about the types of procedures received by the uninsured. Therefore, based on the information available in the HCRIS, it is not known what types of services were provided to the uninsured.
- Providers may submit revised MCRs to CMS. Therefore, it is possible that the data for any individual provider available to us at the time this report was completed may vary if the same analysis is performed at a later date based on the data available in the HCRIS.

Further, for the purposes of our analyses we excluded MCRs for any of the following reasons:

- MCRs associated with facilities located in U.S. territories
- MCRs with total unreimbursed and uncompensated care costs of \$0 or less than \$0
- MCRs with total charity care costs for the uninsured of \$0 or less than \$0
- MCRs with reported negative bad debt
- MCRs where the total charity care costs for the uninsured exceed total general service costs
- MCRs where the total unreimbursed and uncompensated care costs exceed total general service costs

Based on these exclusion criteria, we excluded approximately 11% of reported total general service costs and 7% of reported charity care costs for the uninsured for hospital FYE 2018 MCRs.

Hospitals in urban and rural areas

To identify urban versus rural providers, we relied upon the information published by CMS in the FY 2020 Inpatient Prospective Payment System (IPPS) provider file. In the IPPS file, CMS identifies each hospital as either large urban, other urban, or rural.^{16, 17} We mapped this information onto the HCRIS data based on each hospital's Medicare ID.

¹⁶ Centers for Medicare and Medicaid Services (September 2020). Medicare Claims Processing Manual. Available at: <https://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/Downloads/clm104c03.pdf>

¹⁷ Office of Management and Budget (December 2000). Standards for Defining Metropolitan and Micropolitan Statistical Areas. Federal Register. Available at: <https://www.federalregister.gov/documents/2000/12/27/00-32997/standards-for-defining-metropolitan-and-micropolitan-statistical-areas>

Hospital ownership types

To identify the ownership type of each hospital, we used information provided in the Medicare cost reports. Using the information provided in the cost reports, we classified each hospital as either for profit, nonprofit, government, or other. Our categorization of the information provided in the cost reports to these four categorizations is summarized in Figure 19.

FIGURE 19: CATEGORIZATION OF HOSPITAL OWNERSHIP TYPE IN MCR

OWNERSHIP TYPE REPORTED IN MCR	MILLIMAN OWNERSHIP CLASSIFICATION
Church	Nonprofit
Private (Not for Profit)	Nonprofit
Private (For Profit)	For Profit
Federal	Government
State	Government
Local	Government
Hospital District or Authority	Government
Physician Ownership	Other
Other	Other

Hospital CMS overall star ratings

To identify the CMS overall star rating for each hospital, we relied upon information published in the most recent Hospital Compare dataset. The measures used to determine the overall rating are categorized in seven different categories. These categories include mortality, safety of care, readmission, patient experience, effectiveness of care, timeliness of care, and efficient use of medical imaging. There are multiple measures within each of these seven categories. It should be noted that at minimum a hospital must report at least three measures in at least three of the seven categories for an overall star rating to be generated. As a result, not all hospitals have an overall star rating. Further, it is possible that the measures used to generate an overall star rating vary across the different hospitals.

For our analysis we relied upon the published star ratings data as of October 19, 2020. An overall star rating was not available for every hospital in the MCR data; therefore, only hospitals with available ratings were included in our analysis of charity care costs for the uninsured by star rating.

Total uncompensated care costs

As part of our analysis of the HCRIS, we also evaluated additional information available in worksheet S-10 of the MCR. Worksheet S-10 reports the total uncompensated costs for each facility. Total uncompensated care costs are comprised of the total charity care costs for the uninsured, total charity care costs for the insured, and bad debt costs. We reviewed the total charity care costs, bad debt costs, and total uncompensated care costs in the three most recent years with complete data. Figure 20 below summarizes these costs for FYEs 2016, 2017, and 2018.

FIGURE 20: TOTAL UNCOMPENSATED CARE COSTS CALCULATION

COST COMPONENT	FYE 2016	FYE 2017	FYE 2018
Total Charity Care Costs for Uninsured	\$16,317,418,028	\$17,524,341,487	\$19,620,675,338
Total Charity Care Costs for Insured	\$5,988,828,590	\$5,408,478,097	\$6,002,782,119
Total Bad Debt Costs	\$14,344,265,706	\$13,898,070,370	\$14,104,219,247
Total Uncompensated Care Costs	\$36,650,512,324	\$36,830,889,954	\$39,727,676,704

As part of developing this report, we also conducted research to find other publicly available information related to charity care costs for the uninsured and total uncompensated care costs to use as a point of comparison in our report. While we did not find data specific to charity care cost for the uninsured, we did find information published by the American Hospital Association (AHA) related to total uncompensated care level across the United States.

Each year, AHA conducts a survey through which information about uncompensated care costs is collected from hospitals across the nation. AHA defines uncompensated care costs as the amount of bad debt costs plus the costs incurred by the hospital for care provided that the hospital was not expecting to receive payment for. Figure 21 below summarizes the total uncompensated care costs determined by the AHA in 2016 through 2018.¹⁸

FIGURE 21: AHA REPORTED TOTAL UNCOMPENSATED CARE COSTS (IN BILLIONS)

COST COMPONENT	2016	2017	2018
Total Uncompensated Care Costs	\$38.4	\$38.4	\$41.3

While the total uncompensated care costs we calculated based on the HCRIS are lower in each year, we feel the HCRIS data overall is reliable. There are several main factors that could explain differences between the HCRIS data and the AHA survey data. First, the AHA survey data and the HCRIS dataset likely contain information about a different set of facilities. In other words, there are likely hospitals that respond to the AHA survey that may not have submitted data to HCRIS, and vice versa. The AHA survey data also collected information from more hospitals than our HCRIS calculation includes. In 2018, the AHA survey resulted in uncompensated costs of \$41.3 billion across 5,198 hospitals. In FYE 2018, we calculated the total uncompensated care costs based on the HCRIS data to be \$38.2 billion based on MCRs for 4,307 hospitals.

As previously mentioned, providers report information in the MCR based on their most recent fiscal year of operations, which can be unique to each facility and may differ from the period reported for the AHA survey data. Further, we excluded the data reported by some facilities for the purposes of our analyses, as identified above.

NIS analysis assumptions, methodologies, and limitations

Below are several limitations to the NIS as it relates to how we define uninsured discharges throughout this report:

- The NIS discharge and payer information is grouped at a regional level. However, each state defines uncompensated care or charity care in different ways, or in some cases, not at all. From our study of each state's documentation, states most frequently grouped uninsured care into "self-pay" or "no charge" categories.
- For the purposes of our analysis, we used the combination of these two categories to represent "uninsured care." Note that we made comparisons to the charity care costs for the uninsured in the HCRIS data to compare the reasonability of this assumption and found them reasonably consistent by region.

Region definitions

This report contains regional information to evaluate to what extent costs and utilization may vary nationally. The HCRIS data captures state-level information; the NIS only contains regional information for each discharge. In order to make consistent comparisons, we assigned each facility in the HCRIS data to a geographic region consistent with the nine geographic areas defined in NIS.¹⁹ We were able to identify the state in which each facility is located using information published by CMS in the Provider of Services (POS) file. We assigned each facility with HCRIS data to a particular geographic region based on the state in which the facility is located. Figure 22 identifies the states assigned to each region.

¹⁸ American Hospital Association (January 2021). Fact Sheet: Uncompensated Hospital Care Cost. Available at: <https://www.aha.org/fact-sheets/2020-01-06-fact-sheet-uncompensated-hospital-care-cost>

¹⁹ Agency for Healthcare Research and Quality (September 2008). NIS Description of Data Elements: Census Division of Hospital. Available at: https://www.hcup-us.ahrq.gov/db/vars/hosp_division/nisnote.jsp

FIGURE 22: GEOGRAPHIC REGION DETAILS

GEOGRAPHIC REGION	STATES ASSIGNED TO THE REGION
New England	ME, NH, VT, MA, RI, CT
Middle Atlantic	NY, PA, NJ
East North Central	WI, MI, IL, IN, OH
West North Central	MO, ND, SD, NE, KS, MN, IA
South Atlantic	DE, MD, DC, VA, WV, NC, SC, GA, FL
East South Central	KY, TN, MS, AL
West South Central	OK, TX, AR, LA
Mountain	ID, MT, WY, NV, UT, CO, AZ, NM
Pacific	AK, WA, OR, CA, HI

Source: Agency for Healthcare Research and Quality. [NIS Description of Data Elements: Census Division of Hospital](#).

Appendix B: Top 25 APR DRGs for uninsured and commercial discharges

Below are the top 25 DRGs, ranked by percentage of total discharges, for uninsured and commercial discharges.

FIGURE 23: TOP 25 APR DRGS FOR UNINSURED DISCHARGES, RANKED BY PERCENTAGE OF DISCHARGES

TOP DRGS FOR UNINSURED DISCHARGES	UNINSURED		COMMERCIAL	
	% OF TOTAL DISCHARGES	% OF DISCHARGES WITH ER	% OF TOTAL DISCHARGES	% OF DISCHARGES WITH ER
Septicemia & Disseminated Infections	5.1%	91%	3.3%	86%
Vaginal Delivery	4.9%	15%	16.3%	10%
Diabetes	3.0%	93%	1.0%	88%
Cellulitis & Other Skin Infections	3.0%	91%	1.2%	80%
Major Depressive Disorders & Other/Unspecified Psychoses	2.9%	61%	1.6%	51%
Alcohol Abuse & Dependence	2.8%	84%	0.8%	75%
Disorders of Pancreas Except Malignancy	2.2%	91%	1.1%	85%
Cesarean Section without Sterilization	2.1%	12%	7.5%	7%
Heart Failure	2.0%	91%	0.9%	83%
Cholecystectomy	1.8%	90%	1.2%	80%
Bipolar Disorders	1.7%	62%	1.0%	54%
CVA & Precerebral Occlusion with Infarction	1.5%	89%	0.9%	83%
Chronic Obstructive Pulmonary Disease	1.4%	93%	0.8%	83%
Percutaneous Cardiac Intervention with AMI	1.4%	77%	1.1%	73%
Other Pneumonia	1.3%	91%	0.9%	82%
Acute Kidney Injury	1.3%	91%	0.8%	80%
Schizophrenia	1.2%	69%	0.5%	54%
Kidney & Urinary Tract Infections	1.1%	92%	0.6%	84%
Depression Except Major Depressive Disorder	1.1%	61%	0.4%	53%
Hypertension	1.1%	92%	0.3%	87%
Intentional Self-Harm & Attempted Suicide	1.1%	90%	0.4%	87%
Seizure	1.0%	86%	0.6%	61%
Infectious & Parasitic Diseases Including HIV with O.R. Procedure	1.0%	87%	0.6%	80%
Other Gastroenteritis, Nausea & Vomiting	1.0%	92%	0.8%	83%
Peptic Ulcer & Gastritis	1.0%	91%	0.5%	83%

Note: Limited to ages 18 to 64

FIGURE 24: TOP 25 APR DRGS FOR COMMERCIAL DISCHARGES, RANKED BY PERCENTAGE OF DISCHARGES

TOP DRGS FOR COMMERCIAL DISCHARGES	UNINSURED		COMMERCIAL	
	% OF TOTAL DISCHARGES	% OF DISCHARGES WITH ER	% OF TOTAL DISCHARGE	% OF DISCHARGES WITH ER
Vaginal Delivery	4.9%	15%	16.3%	10%
Cesarean Section without Sterilization	2.1%	12%	7.5%	7%
Septicemia & Disseminated Infections	5.1%	91%	3.3%	86%
Knee Joint Replacement	0.2%	1%	3.1%	1%
Hip Joint Replacement	0.3%	20%	2.0%	3%
Major Depressive Disorders & Other/Unspecified Psychoses	2.9%	61%	1.6%	51%
Procedures for Obesity	0.6%	0%	1.6%	1%
Cesarean Section W Sterilization	0.3%	8%	1.3%	6%
Cholecystectomy	1.8%	90%	1.2%	80%
Cellulitis & Other Skin Infections	3.0%	91%	1.2%	80%
Dorsal & Lumbar Fusion Procedure Except For Curvature of Back	0.2%	32%	1.2%	5%
Percutaneous Cardiac Intervention W Ami	1.4%	77%	1.1%	73%
Antepartum without O.R. Procedure	0.7%	46%	1.1%	29%
Disorders Of Pancreas Except Malignancy	2.2%	91%	1.1%	85%
Cardiac Arrhythmia & Conduction Disorders	1.0%	89%	1.0%	75%
Major Large Bowel Procedures	0.4%	50%	1.0%	20%
Diabetes	3.0%	93%	1.0%	88%
Bipolar Disorders	1.7%	62%	1.0%	54%
CVA & Precerebral Occlusion with Infarct	1.5%	89%	0.9%	83%
Other Pneumonia	1.3%	91%	0.9%	82%
Heart Failure	2.0%	91%	0.9%	83%
Diverticulitis & Diverticulosis	0.8%	91%	0.8%	83%
Uterine & Adnexa Procedures for Leiomyoma	0.3%	12%	0.8%	3%
Alcohol Abuse & Dependence	2.8%	84%	0.8%	75%
Acute Kidney Injury	1.3%	91%	0.8%	80%

Note: Limited to ages 18 to 64



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