Five Most Frequent DRGs in Washington's Community Hospitals, 2010–2021:

Part I - Total inpatients

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Introduction

Hospital care is an integral part of population health care. It provides care for patients with conditions that require complex treatment. Each year, Washington's community hospitals treat hundreds of thousands of patients.

This report examines changes in the medical conditions for which Washington residents received care in community hospitals from 2010 to 2021. Information from this report expands upon the Strategic Health Planning (i.e., State Health Plan) document that OFM released in 2010 in response to state law (RCW 43.370) that directed OFM to develop a statewide health resources strategy. Understanding the most frequent diagnoses of inpatient hospitalizations can help with health care planning and prevention activities.

Washington's hospitals treat a vast number of medical conditions daily, making comprehensive reporting on each condition challenging. Instead, we classify conditions using the Medicare Severity Diagnosis Related Group (MS-DRG) system, which consolidates numerous conditions into manageable categories. Rather than reporting on all MS-DRGs, we focus on the five most frequent MS-DRGs each year.

What is an MS-DRG?

Hospital discharge records document the medical conditions for which patients were treated, using diagnosis codes for both record-keeping and billing purposes. The sheer number of diagnosis codes necessitated the development of classification systems in the 1980s, leading to the creation of Diagnosis-Related Groups (DRGs), which consolidate related diagnosis codes into broader categories. The total number of DRGs is fewer than 500, encompassing all diagnosis codes. Different DRG versions exist for various applications, but this report utilizes the Medicare Severity DRG (MS-DRG) developed by the Centers for Medicare & Medicaid Services (CMS). MS-DRG accounts for factors such as primary and secondary diagnoses, procedures, sex, and discharge status to adjust Medicare inpatient care payments. For simplicity, we refer to MS-DRG as DRG throughout the report.

Data source and methods

The data in this report comes from the Comprehensive Hospital Abstract Reporting System (CHARS), Washington's hospital inpatient discharge database, covering the years 2010 to 2021. Using MS-DRG codes, we identified the most frequent DRGs statewide each year and examined how their rankings shifted over time. In addition to analyzing overall trends, we reviewed the most frequent DRGs for patient groups based on age, sex, race, Hispanic origin, payer type, and Accountable Community of Health[1]. Additionally, we assessed the average cost and length of stay for the most frequent DRGs statewide.

MS-DRG codes can change over time through various mechanisms, including the introduction of multiple new codes replacing a single previous code, consolidation of multiple previous codes into a single new code, discontinued codes without replacements, and entirely new codes unrelated to previous versions. To ensure consistency in our analysis, we recoded certain DRGs to reflect such changes, denoting these modifications with the prefix "N." This approach allows for more accurate trend assessments and comparisons across different periods.

This report is organized into seven parts, each presented as a separate document. Part I provides estimates of the five most frequent DRGs for total inpatients from 2010 to 2021. Parts II through VII focus on the five most frequent DRGs within specific patient characteristic groups and are available along with Part I at https://ofm.wa.gov/washington-data-research/health-care/health-care-access-utilization-and-quality:

- Part I – Total inpatients
- Part II – Inpatients by sex
- Part III – Inpatients by age group
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- Part V – Inpatients by Hispanic origin
- Part VI – Inpatients by payer type
- Part VII – Inpatients by Accountable Community of Health
- Appendix – MS-DRG Code List

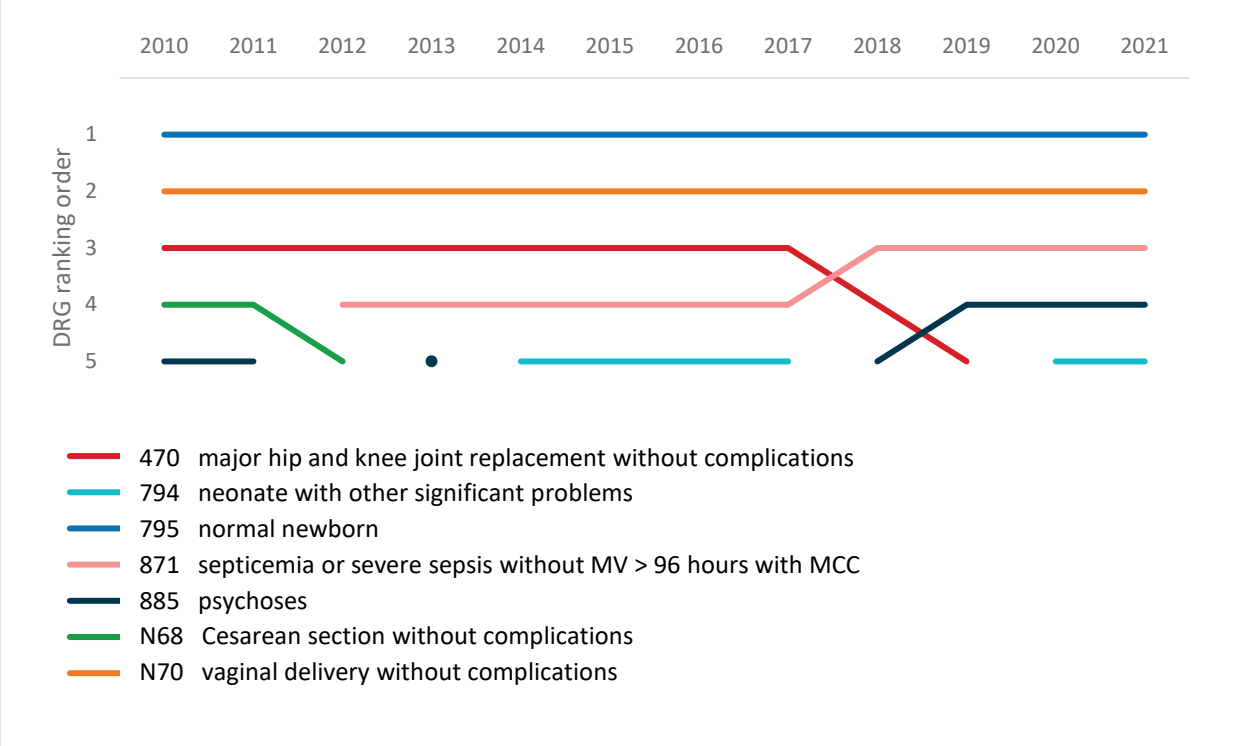
[1] An Accountable Community of Health (ACH) is a regional coalition consisting of representatives from a variety of sectors who work together to improve population health. Each ACH represents a county or a group of adjacent counties.

Five most frequent DRGs – Total inpatients

For the overall inpatient population, the top two DRGs remained unchanged from 2010 to 2021, both related to birth: DRG 795 (normal newborn) consistently ranked first, while DRG N70 (vaginal delivery without complications) held second place throughout the period. DRG 470 (major hip and knee joint replacement without complications) was the third most frequent DRG until 2018 but began declining in ranking thereafter. By 2020, it had dropped out of the top five entirely. This decline initially resulted from a shift in hip and knee joint replacement surgeries from inpatient to outpatient settings, along with changes in Medicare coverage. The trend accelerated in 2020 and 2021 due to the suspension of elective surgeries—including most DRG 470 cases—as hospitals prioritized resources for managing the COVID-19 pandemic.

Another birth-related DRG, DRG N68 (Cesarean section without complications), ranked fourth in 2010 and 2011, but declined to fifth place in 2012 before exiting the top five altogether from 2013 onward. The changes in Cesarean section rankings may be tied to shifts in provider behavior and evolving reimbursement policies, particularly the growing parity between vaginal and Cesarean deliveries.

Figure I-1. Five most frequent DRGs in Washington, total inpatients, 2010-2021



DRG 871 (septicemia or severe sepsis without mechanical ventilation over 96 hours, with major complication or comorbidity [MCC) first entered the top five in 2012 at 4th place, gradually

rising to 3rd place by 2018, where it remained through 2021. Its upward movement may reflect increased Medicare spending on sepsis diagnoses, highlighting shifts in hospitalization trends for severe infections.

DRG 885 (psychoses) originally ranked 5th but dropped out of the top five for several years before reappearing as the 5th most common DRG in 2018. It continued to rise in prominence, reaching 4th place between 2019 and 2021.

DRG 794 (neonate with other significant problems) did not appear among the top five until 2014, when it climbed to 5th place. It maintained this position through 2021, except for brief declines in 2018 and 2019.

Collectively, the top five DRGs accounted for about 30% of all hospital discharges in 2010, with the most common DRG alone representing nearly one-tenth of total discharges. Over time, however, the share of discharges represented by the top five DRGs declined. By 2021, they accounted for approximately 26% of total hospital discharges, indicating a broadening distribution of inpatient conditions.

Table I-1. Number and percentage of five most frequent DRGs in Washington, total inpatients, 2010-2021

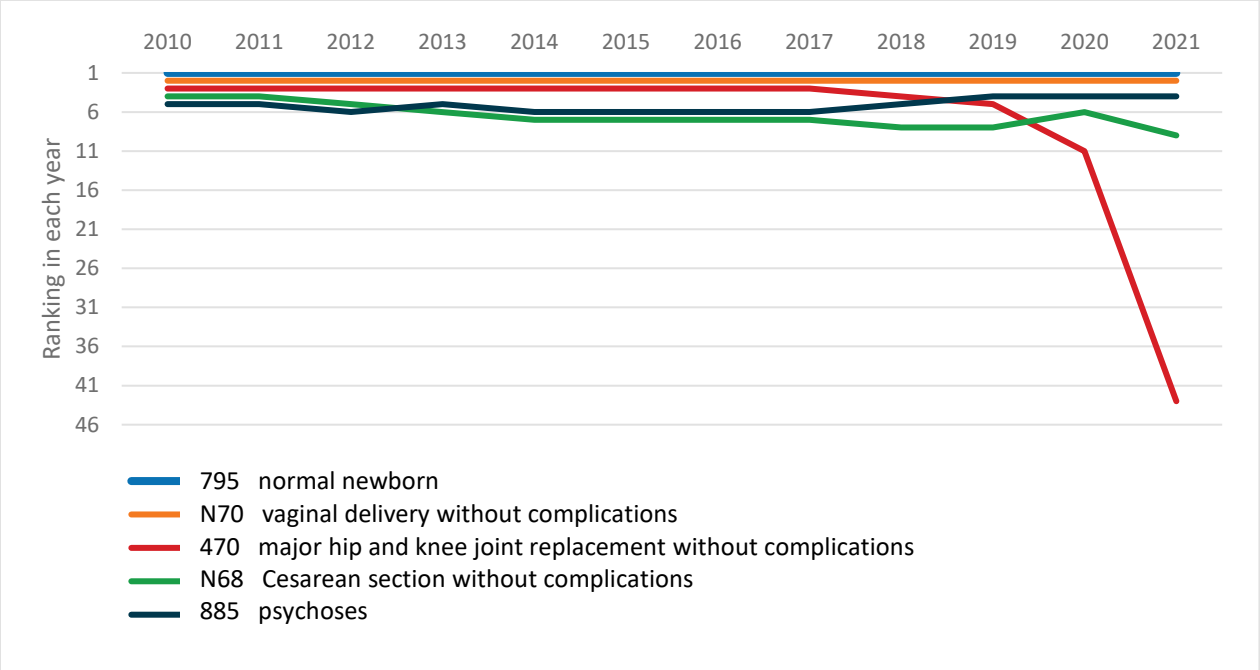
	1st DRG			2nd DRG			3rd DRG			4th DRG			5th DRG		
	MS-DRG	N	% Total	MS-DRG	N	% Total	MS-DRG	N	% Total	MS-DRG	N	% Total	MS-DRG	N	% Total
2010	795	58,777	9.0	N70	45,386	7.0	470	22,136	3.4	N68	14,833	2.3	885	13,390	2.1
2011	795	59,413	9.2	N70	44,732	6.9	470	22,651	3.5	N68	14,691	2.3	885	13,747	2.1
2012	795	57,699	9.0	N70	43,830	6.8	470	22,908	3.6	871	14,516	2.3	N68	14,089	2.2
2013	795	56,287	8.9	N70	44,044	7.0	470	24,541	3.9	871	17,651	2.8	885	13,442	2.1
2014	795	57,618	9.1	N70	45,875	7.2	470	26,172	4.1	871	21,035	3.3	794	14,256	2.2
2015	795	57,264	8.8	N70	46,088	7.1	470	27,505	4.2	871	23,559	3.6	794	15,663	2.4
2016	795	54,885	8.4	N70	46,813	7.2	470	28,449	4.4	871	23,458	3.6	794	18,395	2.8
2017	795	50,295	7.7	N70	46,292	7.1	470	29,036	4.4	871	26,038	4.0	794	20,188	3.1
2018	795	50,168	7.8	N70	43,586	6.8	871	25,868	4.0	470	25,251	3.9	885	18,942	2.9
2019	795	49,392	7.7	N70	39,528	6.2	871	26,904	4.2	885	21,424	3.3	470	20,786	3.2
2020	795	45,423	7.8	N70	37,341	6.4	871	25,175	4.3	885	24,258	4.2	794	20,375	3.5
2021	795	43,833	7.4	N70	36,351	6.1	871	25,375	4.3	885	24,451	4.1	794	22,093	3.7

470 = major hip and knee joint replacement without complications
794 = neonate with other significant problems
795 = normal newborn
871 = septicemia or severe sepsis without MV > 96 hours with MCC
885 = psychoses
N68 = Cesarean section without complications
N70 = vaginal delivery without complications

Tracking the top five DRGs from 2010 through 2021 reveals several notable trends. As previously mentioned, DRGs 795 (normal newborn) and N70 (vaginal delivery without complications) maintained their positions in 1st and 2nd place every year.

Figure I-2 highlights additional shifts in DRG rankings, particularly for DRGs 470 and N68. DRG N68 (Cesarean section without complications) experienced a steady decline, moving from 4th place in 2010 to 9th place by 2021. In contrast, the ranking change for DRG 470 (major hip and knee joint replacement without complications) was significantly more abrupt. From 2010 to 2017, it consistently ranked as the 3rd most common DRG before dropping sharply. Within just four years, it fell from 3rd place in 2017 to 43rd place in 2021. This decline was initially driven by the shift of hip and knee replacement surgeries from inpatient to outpatient settings, largely due to changes in Medicare coverage. The trend was further accelerated in 2020-21 when hospitals halted most elective surgeries—including those associated with DRG 470—to focus resources on managing the COVID pandemic.

Figure I-2. Five most frequent DRGs in 2010 and their rank changes in subsequent years through 2021 in Washington: total inpatients

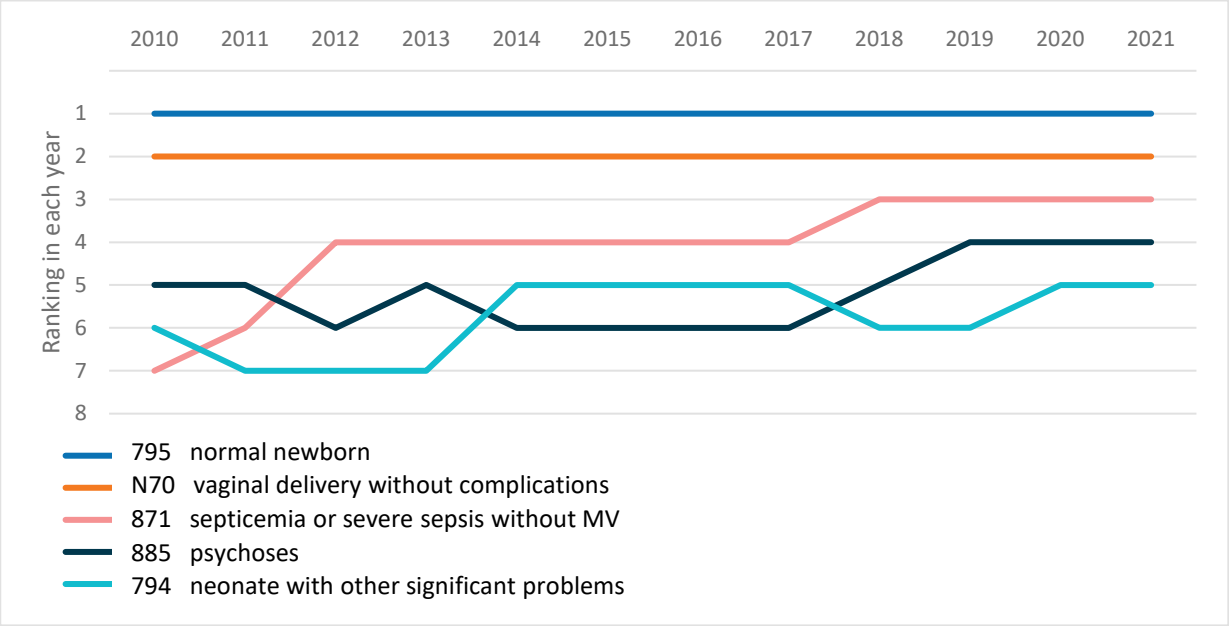


Tracing the rankings of the top five DRGs in 2021 backward reveals that all five had previous rankings at or above 7th place. Three of these—DRGs 795 (normal newborn), N70 (vaginal delivery without complications), and 885 (psychoses)—were already among the top five in 2010, which we previously discussed. Here, we focus on the remaining two: DRGs 794 and 871.

DRG 794 (neonate with other significant problems) fluctuated between the 7th and 5th most common DRG over the years. It started at 6th place in 2010 and gradually moved up one position by 2021. DRG 871 (septicemia or severe sepsis without mechanical ventilation over 96 hours, with MCC) had the most significant ranking shift among the 2021 top five, rising from 7th place in 2010 to 3rd place in 2021.

This backward analysis highlights how these DRGs evolved over time, illustrating stability in some cases while reflecting gradual or accelerated changes in hospitalization trends.

Figure I-3. Five most frequent DRGs in 2021 and their rankings in previous years, Washington, total inpatients: 2010-2021



***Length of stay*.** The average length of stay (LOS, in days) per discharge varied across the five most frequent DRGs, ranging from 1.5 to 12.5 days. For DRGs that appeared on the top five list in multiple years, the average LOS remained relatively stable, with one exception. DRG 885 (psychoses) had an LOS of 9.2 days in 2010, and by 2021, its LOS increased to 13.2 days. Meanwhile, for DRG 795 (normal newborn), the LOS varied by only 0.2 days, between 1.5 and 1.7, and for DRG N70 (vaginal delivery without complications), the LOS varied by only 0.1 days, between 1.7 and 1.8.

***Cost*[2].** The average cost per discharge for the top five DRGs varied considerably, from $1,000 to $21,000 (Table I-2). For DRGs that appeared in multiple years on the top five list, their cost increased from the first year to the last year of appearance (see "Unadjusted cost" in Table I-3). When the cost is standardized using the 2021-dollar value, all but one of those DRGs still showed an increase in cost, suggesting that hospital charges grew at a faster rate than general inflation. DRG 470 (major hip and knee joint replacement without complications) was the exception. Its cost decreased from $23,130 in 2010 to $21,222 in 2019 (both in 2021-dollar value).

Table I-2. Length of stay and unadjusted cost of the five most frequent DRGs in Washington, total inpatients, 2010-2021

	Top 1st DRG			Top 2nd DRG			Top 3rd DRG			Top 4th DRG			Top 5th DRG		
Year	DRG	LOS	Avg Cost	DRG	LOS	Avg Cost	DRG	LOS	Avg Cost	DRG	LOS	Avg Cost	DRG	LOS	Avg Cost
2010	795	1.7	$1,018	N70	1.8	$3,301	470	3.1	$18,613	N68	2.7	$5,692	885	9.2	$7,669
2011	795	1.7	$1,126	N70	1.8	$3,584	470	3.0	$19,057	N68	2.6	$6,160	885	9.8	$10,122
2012	795	1.6	$1,202	N70	1.8	$3,926	470	2.9	$21,253	871	5.8	$15,229	N68	2.6	$6,666
2013	795	1.6	$1,157	N70	1.7	$3,897	470	2.7	$20,540	871	5.8	$14,986	885	9.8	$9,289
2014	795	1.6	$1,149	N70	1.7	$3,914	470	2.6	$19,473	871	5.9	$14,724	794	2.1	$2,204
2015	795	1.6	$1,180	N70	1.7	$4,092	470	2.4	$20,128	871	6.1	$15,449	794	2.1	$2,298
2016	795	1.5	$1,180	N70	1.7	$4,187	470	2.1	$19,456	871	6.1	$15,401	794	2.1	$2,221
2017	795	1.5	$1,235	N70	1.8	$4,387	470	2.0	$19,013	871	6.2	$15,642	794	2.0	$2,282
2018	795	1.6	$1,349	N70	1.8	$4,622	871	6.3	$16,238	470	1.9	$19,069	885	12.5	$12,857
2019	795	1.6	$1,457	N70	1.8	$4,842	871	6.4	$17,618	885	12.1	$14,163	470	1.9	$20,023
2020	795	1.5	$1,501	N70	1.7	$5,302	871	6.7	$19,181	885	12.9	$16,222	794	1.9	$2,726
2021	795	1.5	$1,556	N70	1.7	$5,617	871	7.2	$20,920	885	13.2	$18,026	794	1.9	$2,669

470 = major hip and knee joint replacement without complications
794 = neonate with other significant problems
795 = normal newborn
871 = septicemia or severe sepsis without MV > 96 hours with MCC
885 = psychoses
N68 = Cesarean section without complications
N70 = vaginal delivery without complications

DRG 885 (psychoses) had the largest percentage increase in cost. It increased by 135%, from $9,529 (in 2021-dollar value) in 2010 to $18,026 in 2021. Part of the cost increase was due to the increase in LOS, as we noted before. Another cause was fewer psychiatric beds available in hospitals. Nationally, the availability of psychiatric beds currently is about one-tenth of that in the 1950s.[3]

[2] Cost for a hospital stay is calculated by applying the cost-to-charge ratios published by the federal Agency for Healthcare Research and Quality to the hospital charges in Washington's CHARS files.
[3] Inpatient Psychiatric Care: Top Diagnoses, Cost, Long Wait Times.

Table I-3. Average costs of DRGs in first year and last year appearance in the five most frequent DRGs in Washington, total inpatients: 2010-2021

				Unadjusted cost		Cost in 2021- dollar value[4]	
DRG	DRG description	First Year	Last Year	First Year Cost	Last Year Cost	First Year Cost	Last Year Cost
470	major hip and knee joint replacement without complications	2010	2019	$18,613	*$20,023*	$23,130	$21,222
794	neonate with other significant problems	2014	2021	$2,204	$2,669	$2,523	$2,669
795	normal newborn	2010	2021	$1,018	$1,556	$1,265	$1,556
871	septicemia or severe sepsis without MV > 96 hours with MCC	2012	2021	$15,229	$20,920	$17,973	$20,920
885	psychoses	2010	2021	$7,669	$18,026	$9,529	$18,026
N68	Cesarean section without complications	2010	2012	$5,692	$6,666	$7,073	$7,868
N70	vaginal delivery without complications	2010	2021	$3,301	$5,617	$4,102	$5,617

Data source and methods

For this report, we used data from the Comprehensive Hospital Abstract Reporting System (CHARS). CHARS is a database containing inpatient discharge records for Washington's community hospitals, maintained by the Department of Health. The primary analysis variable was the MS-DRG (Medicare Severity Diagnosis-Related Group) field in CHARS. To provide deeper insights, we cross-tabulated the MS-DRG field with several patient characteristics, including age, sex, race, Hispanic origin, payer (insurance), and county of residence, which we used to define Accountable Community of Health (ACH) regions.

Records were excluded from analysis if critical data fields lacked valid information. For example, records without race data were excluded from race-based analysis, and records without Hispanic origin data were removed from analyses on that characteristic. Likewise, for ACH-based analysis, records for patients residing out of state or without location data were excluded. However, the number of excluded records was minimal.

CHARS does not include descriptions for MS-DRG codes or track changes over time. To supplement this, we downloaded MS-DRG files for all versions from 2010 to 2024 from the Centers for Medicare & Medicaid Services (CMS). Historically, CMS released a new version of MS-DRG annually, but the COVID-19 pandemic led to multiple releases per year. By comparing versions chronologically, we identified new codes, retired codes, code merges (many-to-one), and code splits (one-to-many). For modified codes, we assigned a different identifier using a separate code scheme, applying the prefix "N" followed by a sequential number, such as "N74."

[4] Based on CPI adjustment factors from *Consumer Price Index Data from 1913-2025*.

The latest MS-DRG descriptions were used in cases of code changes. For example, “N74” includes the previous code “781” along with the current codes “817,” “818,” “831,” and “832,” with the updated description “Other antepartum diagnoses with or without O.R. procedures with CC/MCC.” These modified MS-DRG codes were then merged with CHARS data to improve code descriptions and track changes.

To analyze hospitalization costs, we converted hospital charges into estimated costs using cost-to-charge ratios (CCR) from the federal Agency for Healthcare Research and Quality. Annual CCRs were applied to CHARS discharge records to assign costs accordingly.

Yearly frequencies were calculated using MS-DRG codes for the state total and for each patient characteristic group. Based on these frequency results, we identified and reported the five most frequent MS-DRGs. Additionally, for these DRGs, we calculated and included the average length of stay and hospitalization cost statewide.

We also analyzed the changes in the five most frequent DRGs from both 2010 and 2021 to understand their ranking shifts over time. For the five most frequent DRGs in 2010, we traced their frequency rankings forward to determine whether any remained among the most frequent DRGs through 2021. If they dropped in rank, we assessed how far they moved down in the ranking by the end of the period. Conversely, for the five most frequent DRGs in 2021, we examined their rankings retrospectively to see if they had long-standing prevalence or if they represented newer trends in hospitalization. If any of the current most frequent DRGs were new conditions, we analyzed the rate at which they ascended into the top five by 2021. This approach provides valuable insight into evolving healthcare utilization patterns and the emergence or decline of specific conditions over time.