THE DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION

HCAI Technical Note for Healthcare Payments Data (HPD): Inpatient Hospital Cost in 2023

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Healthcare Payments Data Overview

The Healthcare Payments Database (HPD) serves as California's All Payer Claims Database (APCD), a research database made up of healthcare administrative data such as claims and encounters. These records are generated from transactions between payers and providers for insured individuals and collected from California plans and insurers. For additional information on the health plans and insurers that submitted data to HCAI, see the latest HPD Snapshot Technical Note found on the California Health and Human Services (CalHHS) Open Data Portal (ODP) page for the HPD Snapshot report.

Visit the HPD Program Overview web page for more information about the program and its aims.

Data Analysis Methods

Years of Data

The HPD Inpatient Hospital Cost in 2023 report was constructed using claim and encounter data from calendar year (CY) 2023. Only stays with both first service and last service dates during 2023 were included. Stays that spanned more than one calendar year were not included. The extract date for this report was in March 2025.

Note: Medical claim services for each hospital inpatient stay were included based on the first date of service on each service line, rather than the date on which the claim was processed (or paid) by a plan (“Paid Date”). The Paid Date can be many days or months after the date the service was performed.

Medical Service Lines and Hospital Inpatient Stays

The HPD Inpatient Hospital Cost in 2023 report uses cost data, service dates, provider information, and payer type information from medical claim service line records. Medical services refer to individual procedures that occur during the stay, encompassing everything from consultations with providers to anesthesia administration to hospital room and board. Both facility and professional services that were rendered during an acute inpatient hospital stay are included and identified using bill type, dates of service, and place of service on the service line records. All analyses are conducted at the inpatient stay, or “discharge” level. Medical service line records associated with each discharge are identified by clustering claims with the same member, service date ranges, and place of setting.

Each discharge is classified using Medicare-Severity Diagnosis-Related Groups (MS-DRG). The MS-DRG system classifies inpatient hospital stays into groups based on diagnosis, procedures, and patient characteristics to determine payment. DRGs are categories of inpatient stays with similar clinical conditions, severity (based on complications and comorbidities), and expected resource use for treatment. For more information on MS-DRGs, please see the CMS website on MS-DRG Classifications and Software. Similar MS-DRGs were aggregated into groups for analysis by HCAI researchers. See the Type of Inpatient Stay stratification section below for details or see the Appendix for a full list of the MS-DRGs in each category.

Submitter Supplied Allowed Amount and Imputed Allowed Amount[1]

California's HPD receives records for both Fee-For-Service (FFS) claims and capitated encounters. While the submitted FFS claim records typically document the exact allowed amount for the services rendered, the records submitted for capitated encounters include a "FFS Equivalent"—an estimate of what the allowed amount would have been had the services been paid under a FFS or other non-capitation arrangement. HCAI found that some submitted FFS Equivalents are incomplete or unreasonable (e.g., missing a FFS Equivalent, or only include the patient's portion in the estimate). To improve the quality of cost estimates, an imputation process was developed to impute FFS Equivalent amounts for capitated encounters with unreliable or missing data. For more detail on the FFS Equivalent imputation methodology, please see the documentation here.

The analyses for this report use the allowed amount reported by the submitter for services paid under a FFS or other non-capitation payment arrangement and the reported FFS Equivalent for services paid under a capitated payment arrangement if the latter is provided and reliable. When the FFS Equivalent is missing or determined to be unreliable, then the imputed FFS Equivalent amount is used.

Reported Metrics

Discharge Count: The number of distinct inpatient stay discharges that occurred in 2023. Each inpatient discharge consists of a cluster of medical service lines, a billing provider, submitter, submitted claim number, and service date range. Following the California Health and Human Services Agency's Data De-Identification Guidelines, inpatient discharge counts of less than 30 are masked from the analyses, replaced by -1 in the data and shown as "< 30" in the visualizations. Discharge counts of 30 or more are rounded to the nearest 10 to avoid unmasking of suppressed data using complementary cells.

Cost: The sum of allowed amount values across all inpatient facility and associated professional service records during each inpatient stay, excluding records with a "denied" claim status and claims paid by a secondary or tertiary payer. In uncommon situations where inpatient stay records were linked to multiple payer or provider locations, a deduplication process was used to categorize each stay to one subgroup. This procedure evaluated allowed amounts, service counts, and payer hierarchy to ensure primary payers and locations were accurately identified and allowed amounts were not overcounted. Cost is reported as the median cost per discharge in each subgroup and aggregated group, along with the interquartile range (IQR) – the range bounded by the 25th and 75th percentiles. Groups with less than 30 discharges are reported without an IQR and highlighted in red to indicate that the median is based on a small set of values and should be interpreted with caution. Furthermore, cases exhibiting a broad interquartile range coupled with a low discharge count should be interpreted carefully, as the IQR may be more influenced by outliers under these circumstances.

A separate severity-adjusted cost is calculated for each discharge using the MS-DRG severity weight assigned to each discharge. This standardization of cost reflects the median cost if variation in patients' conditions and resources used are considered. For example, if patient A has a cesarean section with no complications (severity weight 0.9) that cost $9,000, their adjusted cost per stay is $9,000/0.9 = $10,000 considering minimum resources used. While patient B also has a cesarean section but with major complications and

[1] Kaiser medical claims are not included in the imputation process due to its unique billing and payment system. However, Kaiser inpatient claims are included in the current analysis on inpatient hospital cost.

comorbidities (severity weight 2.45) that cost $20,000, their adjusted cost per stay is $20,000/2.45 = $8,163. The severity-adjust median cost by region is then calculated using these standardized dollar amounts. Users have the option to compare medians using either the severity-adjusted or unadjusted costs.

Stay Severity: The MS-DRG severity weight associated with each discharge. The median weight per stay and IQR are reported to provide context to the interpretation of cost variations across regions, payers, and types of stays.

Length of Stay: The total duration of a stay in days. The median length per stay and IQR are reported to provide context to the interpretation of cost variations across regions, payers, and types of stays.

Analysis Stratifications

Age Range: Members are grouped into one of three age bands: 0 to 18, 19 to 64, or 65+ based on their age at the end of the year.

Covered California Region: The billing provider's address in 2023 is used to determine the location of each inpatient stay and assign each stay to one of the 19 Covered California regions. These regions are Alameda County; Central Coast; Central Valley; Contra Costa County; Eastern Counties; Fresno, Kings, Madera Counties; Greater Sacramento; Inland Empire; Kern County; Los Angeles County East; Los Angeles County West; North Bay Area; Northern Counties; Orange County; San Diego County; San Francisco County; San Mateo County; Santa Clara County; Santa Cruz, San Benito, Monterey Counties. A "statewide" option is also available for users to view inpatient hospital cost and utilization in California across all regions.

Type of Inpatient Stay: To reduce data suppression from small discharge counts and create meaningful categories, similar DRGs were grouped together into HCAI-defined categories. For example, 20 spinal fusion procedures were grouped into a single "Spinal Fusion" category regardless of the severity or type of spinal fusion procedure. A table detailing the individual DRGs grouped into each category are included in the appendix below.

Payer Types: Payers are the companies, programs, and organizations that oversee insurance plans and reimburse healthcare providers. These have been categorized into 3 payer types:

- Commercial: Insurance products for which the coverage premium is paid by a private party, such as an employer, individual, or other entity.
- Medicare: A federal health insurance program funded by the Centers for Medicare & Medicaid Services (CMS) that provides healthcare benefits to those aged 65 years and over or to disabled beneficiaries of any age. This report disaggregates the Medicare payer type into Traditional Medicare and Medicare Advantage. "Medigap" supplemental coverage is not captured in the HPD.
    - Traditional Medicare: A federal Medicare program managed and administered by CMS that provides Hospital (Part A) and Medical (Part B) coverage.
    - Medicare Advantage: A federal Medicare program administered through commercial insurers; also known as Medicare Part C or Medicare Managed Care. This includes specialized managed care programs such as Special Needs Plans (SNP).

Each stay is assigned a single payer type based on the primary payer of each claim or encounter. Inpatient stays paid by Medi-Cal are excluded from the current version due to incomplete payment information on some facility claims in 2023. Future versions will include the corrected data.

Data Inclusions and Exclusions

Individuals (or members) in HPD with at least one inpatient stay record in 2023 are included in this analysis. The allowed amounts on the medical service lines from the inpatient facility and professional claims or encounters associated with each stay are summed to calculate inpatient costs. Specifically, medical service line records are included if the associated service is either:

- An inpatient facility service rendered in an acute inpatient or hospital setting (determined by bill type codes)
- A professional service rendered at an acute inpatient or hospital setting (determined by place of service codes) during an inpatient stay time frame

Medical service line records were excluded for:

- Null or invalid product code
- Individuals residing outside of California
- Product types not accepted in HPD medical data submission regulations (e.g., dental payers, Medicare Supplemental, etc.)
- Discharges primarily paid by Medi-Cal
- Paid as Secondary or Tertiary claim status
- Adjusted claims that cannot be linked to an original claim (orphaned adjusted claims)
- Dates of first and last inpatient services outside of the reporting period (2023)
- Denied claim status
- Medical service lines with the combined copay, coinsurance, and deductible amount less than $0.

Neonatal, abortion, and HIV related inpatient stays are excluded in this analysis. Pregnancy and delivery inpatient stays are included.

Appendix

Table 1: List of MS-DRG codes (version 42) included in each Type of Inpatient Stay Category. A .csv crosswalk file is available on the California HHS ODP page.

Type of Inpatient Stay Category	MS-DRG Codes
Acute Myocardial Infarction	280, 281, 282, 283, 284, 285
Allergic Reactions	915, 916
Amputation	239, 240, 241, 255, 256, 257, 474, 475, 476, 616, 617, 618
Anal and Stomal Procedures	347, 348, 349
Antepartum Procedures and Disorders	817, 818, 819, 831, 832, 833
Appendectomy	338, 339, 340, 341, 342, 343, 397, 398, 399
Blood Disorders and Procedures	802, 803, 804, 808, 809, 810, 811, 812, 813
Bodily Injury and Trauma	183, 184, 185, 604, 605, 906, 907, 908, 909, 913, 914, 922, 923, 957, 958, 959, 963, 964, 965
Bone Diseases and Arthropathies	553, 554

Type of Inpatient Stay Category	MS-DRG Codes
Bone Marrow Transplant	014, 016, 017
Burns	927, 928, 929, 933, 934, 935
Cardiac Arrhythmias & Conduction Disorders	296, 297, 298, 308, 309, 310, 312
Cardiac Arrhythmias Device Procedures	215, 222, 223, 224, 225, 226, 227, 242, 243, 244, 245, 258, 259, 260, 261, 262, 265, 275, 276, 277
Cardiac Valve, Aortic, and Heart Assist Procedures	216, 217, 218, 219, 220, 221, 268, 269
Cellulitis	602, 603
Cesarean Section	783, 784, 785, 786, 787, 788
Cholecystectomy	411, 412, 413, 414, 415, 416, 417, 418, 419
Cirrhosis and Alcohol Hepatitis	432, 433, 434
COPD, Asthma, & Chronic Lung Diseases	190, 191, 192, 196, 197, 198, 202, 203
Coronary Bypass (CABG) Procedures	231, 232, 233, 234, 235, 236
Cranial and Peripheral Nerve Procedures and Disorders	037, 038, 039, 040, 041, 042, 073, 074
Craniotomy	023, 024, 025, 026, 027, 955
Diabetes	637, 638, 639
Diagnostic Hepatobiliary Procedures	420, 421, 422
Digestive Malignancy	374, 375, 376
Ear, Nose, Mouth, and Throat Disorders	149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159
Ear, Nose, Mouth, and Throat Malignancy	146, 147, 148
Ear, Nose, Mouth, and Throat Procedures	135, 136, 137, 138, 139, 143, 144, 145
Endocarditis	288, 289, 290
Eye Disorders	121, 122, 124, 125
Eye Procedures	113, 114, 115, 116, 117
Female Reproductive System (non-pregnancy) Disorders	757, 758, 759, 760, 761
Female Reproductive System (non-pregnancy) Procedures	734, 735, 742, 743, 744, 745, 746, 747, 748, 749, 750
Female Reproductive System Malignancy	736, 737, 738, 739, 740, 741, 754, 755, 756
Fractures, Sprains, and Strains	533, 534, 535, 536, 537, 538, 562, 563
Gastrointestinal Hemorrhage	377, 378, 379
Gastrointestinal Obstruction	388, 389, 390
Head Injury and Trauma	082, 083, 084, 085, 086, 087, 088, 089, 090
Heart Failure and Shock	291, 292, 293
Hernia Procedures	350, 351, 352, 353, 354, 355
Hip or Knee Replacement Procedures	461, 462, 466, 467, 468, 469, 470, 521, 522
Hypertension and Hypertensive Encephalopathy	077, 078, 079, 304, 305
Immune System Procedures and Disorders	799, 800, 801, 814, 815, 816, 864
Infections of the Nervous System	075, 076, 094, 095, 096, 097, 098, 099
Infectious/Parasitic Diseases	853, 854, 855, 865, 866, 867, 868, 869, 969, 970, 974, 975, 976, 977
Intracranial Vascular Procedures	020, 021, 022

Type of Inpatient Stay Category	MS-DRG Codes
Kidney and Urinary Tract Disorders	686, 687, 688, 689, 690, 693, 694, 695, 696, 697, 698, 699, 700, 725, 726
Kidney and Urinary Tract Procedures	653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 713, 714
Lymphoma and Leukemia	018, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 850
Major Head and Neck Procedures	140, 141, 142
Major Joint or Limb Reattachment	483, 956
Male Reproductive System Malignancy	715, 716, 722, 723, 724
Male Reproductive System Surgical Procedures	707, 708, 709, 710, 711, 712, 717, 718
Mastectomy Procedures and Breast Disorders	582, 583, 584, 585, 597, 598, 599, 600, 601
Mental Health	876, 880, 881, 882, 883, 884, 885, 886, 887
Musculoskeletal and Connective Tissue Malignancy	542, 543, 544
Neurodegenerative Disorders and Malignancies	054, 055, 056, 057, 058, 059, 060
Non-specified	559, 560, 561, 919, 920, 921, 939, 940, 941, 947, 948, 949, 950, 951, 981, 982, 983, 987, 988, 989, 998, 999
Nutrition, Metabolic, or Endocrine Disorders	640, 641, 642, 643, 644, 645
Nutrition, Metabolic, or Endocrine Surgical Procedures	614, 615, 619, 620, 621, 625, 626, 627, 628, 629, 630
Organ Transplant	001, 002, 005, 006, 007, 008, 010, 019, 650, 651, 652
Other Cardiovascular Disorders	286, 287, 294, 295, 299, 300, 301, 302, 303, 306, 307, 311, 313, 314, 315, 316
Other Cardiovascular Procedures	034, 035, 036, 212, 228, 229, 246, 247, 248, 249, 250, 251, 252, 253, 254, 263, 264, 266, 267, 270, 271, 272, 273, 274, 278, 279, 317, 319, 320, 321, 322, 323, 324, 325
Other Hepatobiliary Pancreatic System Disorders	441, 442, 443, 444, 445, 446
Other Hepatobiliary Pancreatic System Procedures	405, 406, 407, 408, 409, 410, 423, 424, 425
Other Major Joint Procedures	485, 486, 487, 488, 489, 506, 507, 508
Other Male Reproductive System Disorders	727, 728, 729, 730
Other Musculoskeletal and Connective Tissue Disorders	052, 053, 539, 540, 541, 545, 546, 547, 551, 552, 555, 556, 557, 558, 564, 565, 566
Other Musculoskeletal and Connective Tissue Procedures	477, 478, 479, 480, 481, 482, 492, 493, 494, 503, 504, 505, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520
Other Neurological Disorders	080, 081, 091, 092, 093, 102, 103, 123
Other Respiratory Disorders	204, 205, 206, 207, 208
Other Respiratory Procedures	163, 164, 165, 166, 167, 168
Other Skin and Subcutaneous Tissue Procedures	500, 501, 502, 579, 580, 581
Other Spinal Procedures	028, 029, 030

Type of Inpatient Stay Category	MS-DRG Codes
Pancreas Disorders	438, 439, 440
Pancreas or Hepatobiliary System Malignancy	435, 436, 437
Peptic Ulcer	380, 381, 382, 383, 384
Peritoneal Adhesiolysis	335, 336, 337
Pleural Effusion	186, 187, 188
Postpartum Procedures and Disorders	769, 776
Pulmonary Edema and Respiratory Failure	189, 199, 200, 201
Pulmonary Embolism	173, 175, 176
Radiotherapy	849
Rehabilitation	945, 946
Removal of Internal Fixation Devices	495, 496, 497, 498, 499
Renal Failure	682, 683, 684
Respiratory Infections and Inflammations	177, 178, 179, 193, 194, 195
Respiratory Neoplasms	180, 181, 182
Seizures & Epilepsy	100, 101
Sepsis & Severe Infections	548, 549, 550, 856, 857, 858, 862, 863, 870, 871, 872
Skin Disorders	592, 593, 594, 595, 596, 606, 607
Skin Graft and Debridement	463, 464, 465, 570, 571, 572, 573, 574, 575, 576, 577, 578, 622, 623, 624, 901, 902, 903, 904, 905
Small and Large Bowel Procedures	329, 330, 331, 332, 333, 334, 344, 345, 346
Spinal Fusion	402, 426, 427, 428, 429, 430, 447, 448, 450, 451, 453, 454, 455, 456, 457, 458, 459, 460, 471, 472, 473
Stomach, Esophageal, and Other GI Disorders	368, 369, 370, 371, 372, 373, 385, 386, 387, 391, 392, 393, 394, 395
Stomach, Esophageal, and Other GI Procedures	326, 327, 328, 356, 357, 358
Stroke and Cerebrovascular Disorders	061, 062, 063, 064, 065, 066, 067, 068, 069, 070, 071, 072
SUD	894, 895, 896, 897, 917, 918
Tracheostomy or Laryngectomy	003, 004, 011, 012, 013
Vaginal Delivery	768, 796, 797, 798, 805, 806, 807
Ventricular Shunt Procedures	031, 032, 033