

# Medicaid Hospital Payment: A Comparison across States and to Medicare

Although low Medicaid physician payment rates relative to those by Medicare have been well-documented, until now there has been little systematic information to characterize the level of Medicaid payments to hospitals. In this brief, we present findings from a first-ever study to construct a state-level payment index to compare fee-for-service (FFS) inpatient hospital payments across states and to benchmark Medicaid payment to other payers such as Medicare. MACPAC's analysis finds that:

- Across states, base Medicaid payment for inpatient services varies considerably, ranging from 49 percent to 169 percent of the national average. This variation is similar to the variation across states previously reported for physician fees (Zuckerman 2014).
- States are not consistently high or low payers across all inpatient services due to differences in their payment policies.
- Payment amounts for the same service can also vary within a state.

In addition to considering variation in base payments, that is, the amounts that hospitals are paid per service or per case, supplemental payments must also be considered when comparing Medicaid hospital payments. Supplemental payments accounted for 49 percent of FFS inpatient hospital payments nationally and between 0.6 and 97.4 percent at the state level in fiscal year (FY) 2015 (MACPAC 2016a). Yet because detailed information is not available at the provider level, the method used to allocate these payments can make a significant difference in a state's relative ranking. Once supplemental payments are taken into account, our analysis finds that:

- Overall, Medicaid payment is comparable or higher than Medicare.
- Specifically, the average Medicaid payment for 18 selected conditions was 6 percent higher than Medicare, and the average Medicaid payment for all but two of the conditions was higher than Medicare.
- The average Medicaid payment for these 18 services was higher than Medicare in 25 states and lower than Medicare in 22 states.

## Payment Index

The payment index was constructed using Medicaid FFS stays at acute care hospitals for non-dually eligible, non-elderly enrollees from calendar year 2010 Medicaid Analytic Extract (MAX) data. Because states use different payment methodologies to pay for inpatient hospital services (e.g., diagnosis-related groups, per diem, and cost-basis) and billing codes vary across all states, we used the All Patient Refined Diagnosis Related Grouper (APR-DRG) to put all stays into a common classification system.<sup>1</sup> Before

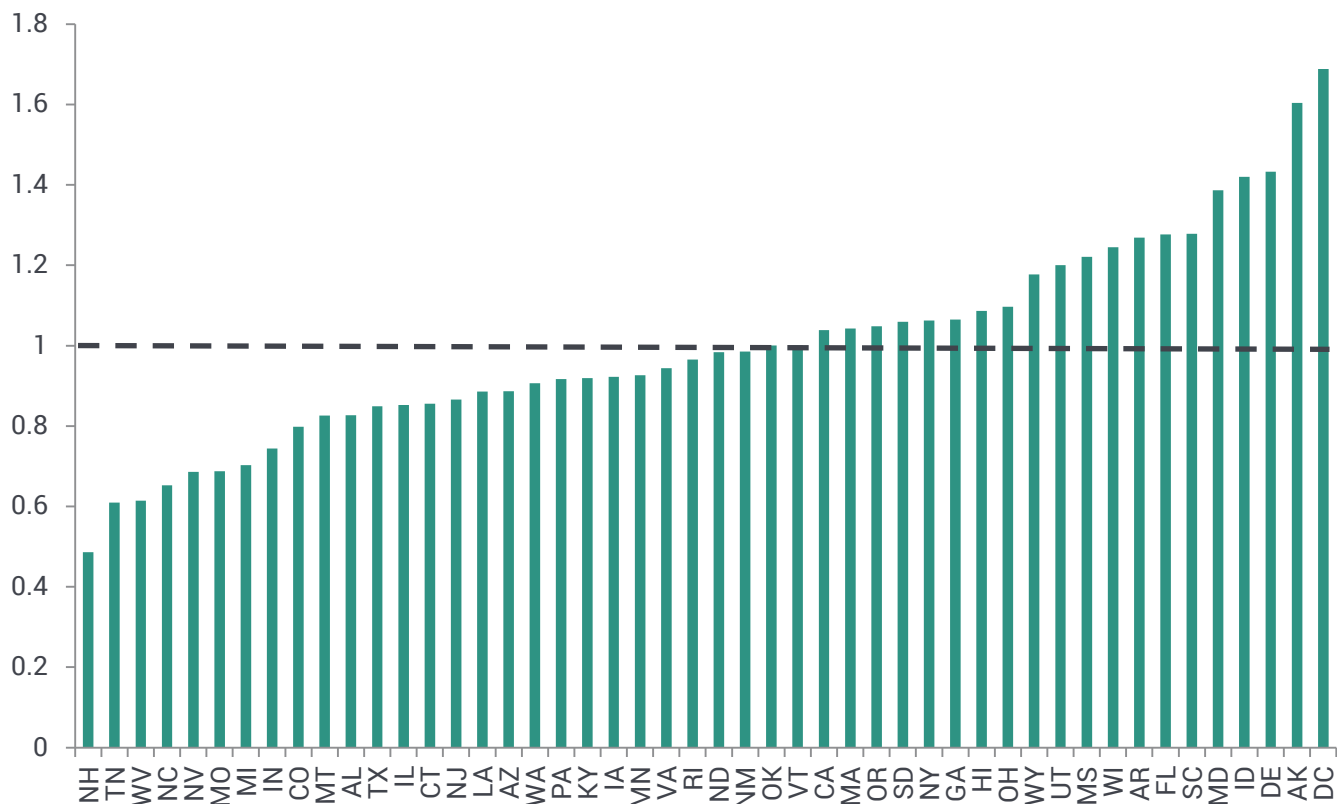


calculating the final payment index, the average payment per stay in each state was adjusted to control for differences in local prices and case mix within each state. The wage- and case mix-adjusted average payment per stay for each state was divided by the overall average payment per stay to calculate a payment index value for each state. The payment index values reflect the average wage- and case mix-adjusted payment in each state relative to the national average. A more detailed discussion of the methodology is provided in Appendix A.

## Medicaid hospital payment levels vary across states

Payment index values range from 0.49 in New Hampshire to 1.69 in the District of Columbia (Figure 1). In other words, payments in New Hampshire were 49 percent lower than the national average, after accounting for wage and case mix differences, while the District of Columbia's were 69 percent higher. States exhibited a similarly wide range of payment rates on 2014 physician fees, ranging from 0.57 in Rhode Island to 2.54 in Alaska (Zuckerman 2014).

**FIGURE 1.** Medicaid Inpatient FFS Payment Index, CY 2010



**Notes:** FFS is fee for service. CY is calendar year. The payment index values are normalized around the national average, which has a value of 1.0. For example, a state with an index value of 1.10 would have payments that were 10 percent higher than the national average. Kansas, Maine, and Nebraska were excluded due to missing data.

**Source:** MACPAC and Urban Institute analysis of CY 2010 MAX data.



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## Medicaid hospital payments vary within states

The payment index based on all services may mask substantial within-state variation and depends on the mix of services and hospitals captured in the data. Medicaid FFS payment for a particular inpatient hospital service can vary within a state for many reasons. The payment may vary by hospital because the payment methodology is inherently hospital-specific (e.g., cost basis) or the state assigns different base rates to different hospitals under a DRG-based methodology. For example, Texas makes adjustments to hospitals' base rates to account for their trauma designation and geographic difference in wages (MACPAC 2014). Additionally, a state may not be a consistently high or low payer for hospital services if it makes adjustments to increase or decrease payment for particular services to support certain policy goals. For example, Tennessee and Washington have lowered payment for cesarean deliveries as part of initiatives to reduce early elective deliveries (CMS 2012). Payments may also vary if the state makes outlier payment adjustments.

To study variability in payment levels across states in detail, we selected 20 APR-DRG-severity subclass combinations—chosen to reflect high-volume, high dollar APR-DRGs as well as span a wide range of medical and surgical care—for close examination. For each of these 20 APR-DRGs, we calculated wage-adjusted state-specific payment amounts and calculated the relative payment index values. We then calculated correlation coefficients between each APR-DRG index and the overall index to measure how well each specific APR-DRG matched the overall results.

Most of the 20 APR-DRG indices were strongly correlated to the overall payment index (Table 1). Overall, states in the top, middle, or bottom third of the distribution base on overall state payment index tend to be ranked similarly across the 20 APR-DRGs and the average of the 20 APR-DRG specific indices.

**TABLE 1.** Correlation of 20 APR-DRG Indices to Overall Payment Index

Correlation coefficient	APR-DRG condition (APR-DRG-severity subclass value)
0.75 or greater	Other pneumonia (139-2); chronic obstructive pulmonary disease (140-2); cellulitis and other bacterial skin infections (383-1); diabetes (420-2); kidney and urinary tract infections (463-2)
0.50–0.75	Seizure (053-2); asthma (141-1); heart failure (194-2); appendectomy (225-1); cesarean delivery (540-1, 540-2), vaginal delivery (560-1, 560-2); other antepartum diagnoses (566-2); chemotherapy (693-2)
0.25–0.50	Renal failure (460-3); neonate birthweight >2499 g, normal newborn or neonate w/ other problem (640-1, 640-2); schizophrenia (750-2)
0–0.25	Bipolar disorders (753-2)

**Notes:** APR-DRG is All Patient Refined Diagnosis Related Grouper. The correlation coefficient is measuring the strength of the linear relationship between the states' index value between the overall payment index and the APR-DRG specific index. A correlation coefficient of 1 indicates a perfect positive relationship and correlation coefficient of 0 indicates no relationship. Numbers in parentheses show the APR-DRG (first 3 digits) and severity subclass (4<sup>th</sup> digit).

**Source:** MACPAC and Urban Institute analysis of CY 2010 MAX data.



However, in quite a few cases, states ranking high or low on the overall payment index ranked substantially differently for specific conditions (Table 2). For example, State A ranked 7<sup>th</sup> on the overall payment index but 34<sup>th</sup> on appendectomy and 40<sup>th</sup> on cesarean delivery.<sup>2</sup> State B was 33<sup>rd</sup> on the overall index but 13<sup>th</sup> on diabetes and 42<sup>nd</sup> on appendectomy. State C was ranked 26<sup>th</sup> on the overall index but ranked 13<sup>th</sup> on appendectomy and 35<sup>th</sup> on diabetes. State D was ranked 46<sup>th</sup> on the overall index but ranked 23<sup>rd</sup> on appendectomy.

**TABLE 2.** Payment Index Variation for Selected States, Overall Index and Selected APR-DRGs

State	Overall index		Appendectomy (225-1)		Diabetes (420-2)		Cesarean section (540-1)	
	Index value	Rank	Index value	Rank	Index value	Rank	Index value	Rank
State A	1.28	7	0.70	34	1.47	4	0.61	40
State B	0.89	33	0.47	42	1.09	13	0.76	33
State C	0.94	26	1.29	13	0.83	35	0.80	30
State D	0.61	46	0.90	23	0.67	43	0.60	42

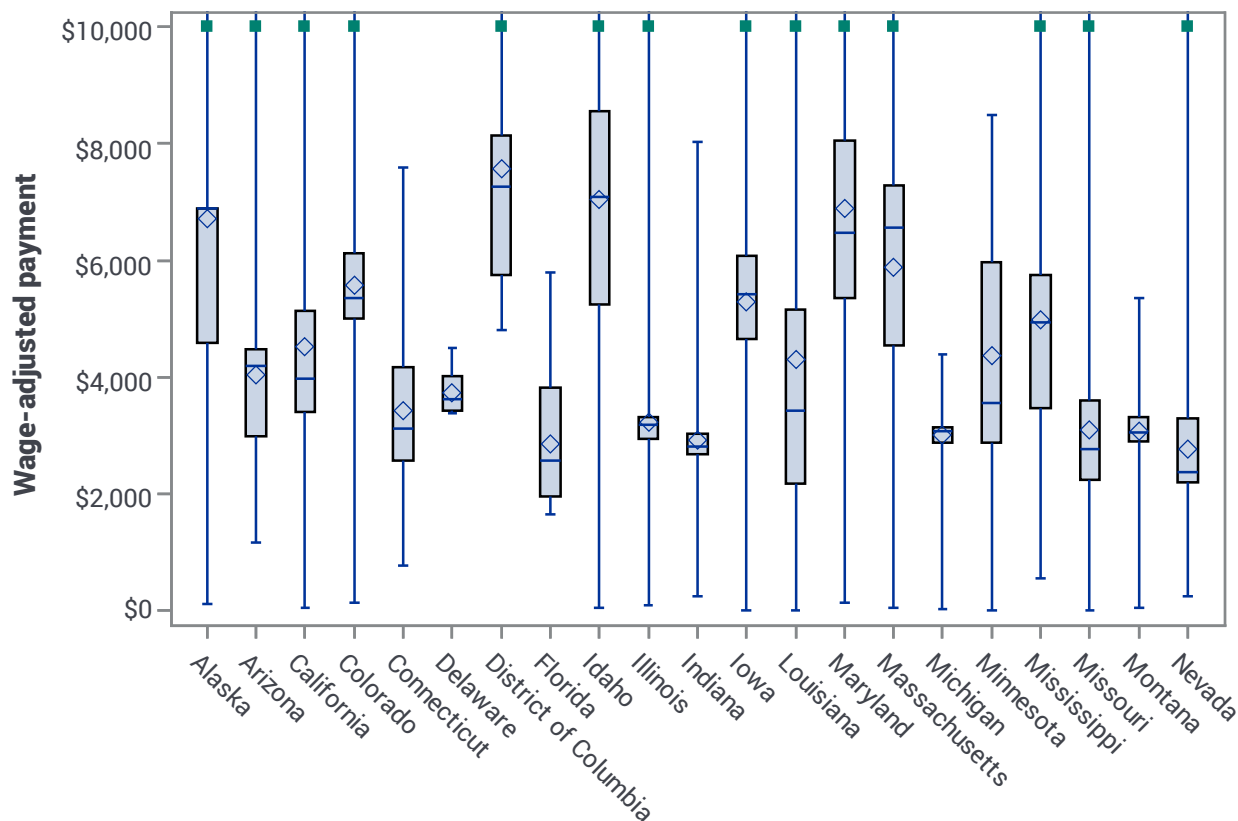
**Notes:** APR-DRG is All Patient Refined Diagnosis Related Group. Payment index values are normalized around the national average, which has a value of 1.0. For example, a state with an index value of 1.10 would have payments that were 10 percent higher than the national average. States have been de-identified to draw attention to how states' relative payment level can vary across services.

**Source:** MACPAC and Urban Institute analysis of CY 2010 MAX data.

Payment amounts for particular services also varied considerably within states. This could be due to the payment methodology; for example, cost-based payment is inherently variable. But even with a more uniform policy such as a DRG-based prospective payment system, a state may assign hospitals a different base rate upon which the DRG weights are applied. For example, states may use different base rates for urban versus rural hospitals.

Given such variation, the mix of hospitals is important to consider when comparing inpatient hospital payments across states or across payers. For example, the range of payments for cesarean section can vary considerably from state to state (Figure 2). Some states such as Idaho and Louisiana have a wide range of payments from the 25<sup>th</sup> to 75<sup>th</sup> percentile while others such as Illinois, Indiana, Michigan, and Montana have a narrow range of payments.



**FIGURE 2.** Payment Range for Cesarean Section in Selected States

**Notes:** Data are for APR-DRG 540-1 which corresponds to cesarean section with minor severity of illness. Boxes on the line show the 25<sup>th</sup> to 75<sup>th</sup> percentile range. The horizontal line within the box corresponds to the median and the diamond corresponds to the mean. The vertical lines extend to the minimum and maximum amounts. The maximum amounts for many states have been trimmed to maintain an appropriate perspective for the graph (trimmed amounts are indicated by the green square at the top of the vertical line).

**Source:** MACPAC and Urban Institute analysis of CY 2010 MAX data.

## Adjusting for the Effects of Supplemental Payments to Hospitals

The MAX data only contain claims-based payment information and do not include data on any lump-sum supplemental payments made to the hospitals. These supplemental payments are a substantial portion of Medicaid hospital payments, making up 49 percent of total hospital payments in FY 2015 (MACPAC 2016a). To account for these supplemental payments, we used state-level data from the CMS-64 financial management reports to estimate the amount of supplemental payments made in the state and used that information to inflate the base payments identified from the MAX data. Because all states do not consistently report supplemental payments in the same way, we developed two methods to adjust the base payment amounts:



- Method 1: Create an adjustment factor based on the sum the total base payments in the MAX data compared to the total hospital payments in the CMS-64 report. Inflate the base payments to the CMS-64 total by applying the adjustment factor to the payment for each stay. This is similar to the methodology we use for MACStats.
- Method 2: Create an adjustment factor based on the ratio of total inpatient payments (i.e., base and supplemental payments) to regular inpatient base payments in the CMS-64. Inflate the base payments to the CMS-64 total by applying the adjustment factor to the payment for each stay.

Supplemental payments are often financed using provider contributions such as provider taxes, certified public expenditures (CPEs), and intergovernmental transfers (IGTs). Because the providers contribute to the non-federal share that states must raise to draw down federal Medicaid funds, one can argue that the net payment they receive is less than the sum of the base and supplemental payments. In order to account for these provider contributions and compare net payments, we adjusted the supplemental payment-adjusted amounts by making an adjustment to account for provider taxes, IGTs, and CPEs using data from a recent GAO study on states' use of financing from health care providers and local governments (GAO 2014).

We calculated payment indices under four scenarios:

- scenario 1: unadjusted base payments;
- scenario 2: apply a state-level adjustment factor to claims-level base payments in order to inflate scenario 1 to CMS-64 total (supplemental payment adjustment method 1);
- scenario 3: inflate scenario 1 based on the ratio of total payments to regular payments in CMS-64 (supplemental payment adjustment method 2); and
- scenario 4: net provider payment level by using scenario 3 and backing out provider taxes, IGTs, CPEs using data from a recent GAO study.

A state's payment index value and relative ranking can vary considerably depending on the scenario chosen (Figure 3). For example, State A was the highest paying state on the unadjusted base rates (scenario 1) but fell to 7<sup>th</sup> on net payments (scenario 4). State B was the 23<sup>rd</sup> rank state on unadjusted base rates (scenario 1) but the top state on net payments (scenario 4). States E and F show the difference between the two supplemental payment adjustment methodologies. State E is 43<sup>rd</sup> under the first supplemental payment methodology (scenario 2) but 4<sup>th</sup> under the second supplemental payment methodology (scenario 3) while State F is 9<sup>th</sup> under the first supplemental payment methodology (scenario 2) but 46<sup>th</sup> under the second supplemental payment methodology (scenario 3).



**TABLE 3.** Payment Index Values and State Rank for Six States under Different Scenarios

State	Scenario 1: unadjusted base payment		Scenario 2: supplemental payment adjustment 1		Scenario 3: supplemental payment adjustment 2		Scenario 4: net payment	
	Index value	State rank	Index value	State rank	Index value	State rank	Index value	State rank
State A	1.69	1	1.22	14	1.21	11	1.32	7
State B	0.99	23	1.81	3	1.87	1	2.23	1
State C	1.04	20	1.13	17	1.15	16	0.92	26
State D	0.49	48	0.47	44	0.53	47	0.46	48
State E	0.75	41	0.54	43	1.51	4	1.27	8
State F	0.69	43	1.34	9	0.56	46	0.57	45

**Notes:** The payment index values are normalized around the national average, which has a value of 1.0. For example, a state with an index value of 1.10 would have payments that were 10 percent higher than the national average. States have been de-identified for this table because we want to draw attention to how states' relative payment level varies across the different scenarios and not the specific states included as examples.

**Source:** MACPAC and Urban Institute analysis of CY 2010 MAX data, CY 2011 CMS-64 financial management report data, and GAO survey data (GAO 2014).

## Comparing Medicaid to Medicare

One goal of this analysis was to compare Medicaid payment for inpatient services to Medicare and provide a comparative measure to the one widely reported for physician fees (Zuckerman 2014). To date, the only such comparative information for hospitals has been based on survey data from the American Hospital Association (AHA) showing that the overall payment-to-cost ratios for Medicaid (including both disproportionate share hospital (DSH) and non-DSH supplemental payments) have been higher than Medicare from 2010 to 2014, but the difference is generally within a few percentage points for several years (AHA 2016).

To obtain Medicare payment information, we used a CMS public use file: Medicare Fee-For-Service Provider Utilization & Payment Data for Inpatient Services for FY 2011 (CMS 2014). This data set contains hospital-level charge and payment information for the top 100 most frequently billed Medicare MS-DRGs. The average Medicare payment amounts in the data set include the MS-DRG amount, teaching, Medicare disproportionate share, capital, and outlier payments for all cases. The payments also include beneficiary cost sharing and any additional payments from third parties for coordination of benefits.

We grouped all of our MAX claims into MS-DRGs for this comparison. We limited the population to non-elderly adults eligible for Medicaid on the basis of a disability to make a comparison on a population more similar demographically to the Medicare population. The Medicaid payments were wage-adjusted.

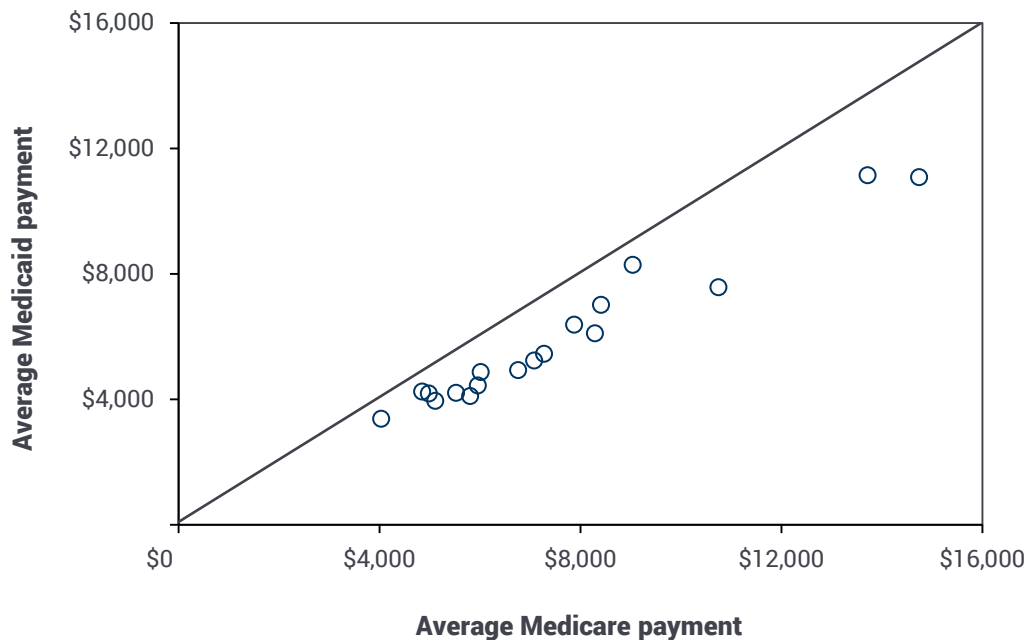
Due to the variation in payment we observed within a state at the DRG and hospital level, we limited our analysis to a small number of MS-DRGs to reduce variability. We selected 18 MS-DRGs that were high



volume for both Medicaid and Medicare. Additionally, we limited our analysis to only those hospitals that were in both the Medicaid and Medicare datasets. To calculate the average Medicaid payment for each MS-DRG, we used the distribution of Medicare discharges across hospitals to control for hospital mix.

Nationally, the average Medicaid base payment (i.e., excluding supplemental payments) for each of these 18 MS-DRGs was less than Medicare, ranging from 70 percent of Medicare for heart failure & shock with major complications or comorbidities (MS-DRG 291) to 92 percent of Medicare for pulmonary edema & respiratory failure (MS-DRG 189) (Figure 4). Overall, Medicaid was 78 percent of Medicare across the 18 MS-DRGs. The average Medicaid base payment was below Medicare for 35 of the 47 states included in the analysis.

**FIGURE 3.** Average Medicaid Base Payment Compared to Average Medicare Payment for 18 Selected MS-DRGs



**Note:** Kansas, Maine, and Nebraska were excluded due to missing data. Hawaii was excluded due to insufficient sample size.

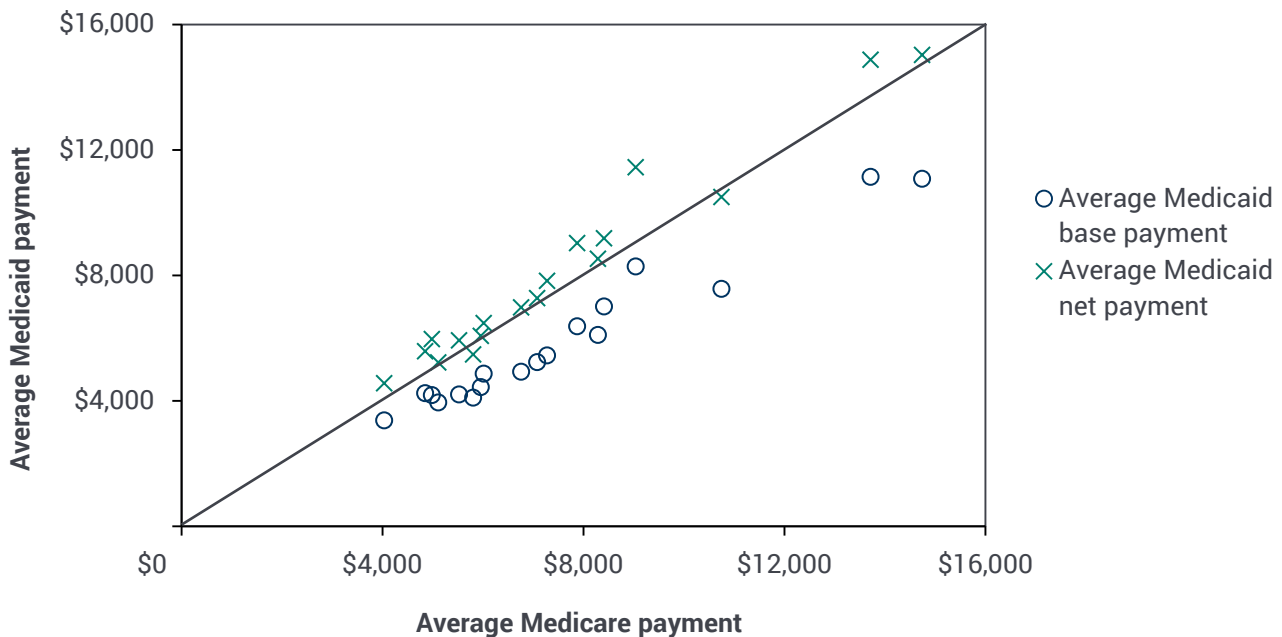
**Source:** MACPAC and Urban Institute analysis of CY 2010 MAX data and FY 2011 Medicare payment data (CMS 2014).

To account for supplemental payments and provider contributions, we applied the same state-level factors that we used for the earlier payment index scenarios. After applying these factors, we found that:

- after accounting for supplemental payments and provider contributions, the average Medicaid net payment was above Medicare for all but two of the MS-DRGs (Figure 5);
- on average, Medicaid net payment was 6 percent higher than Medicare across the 18 MS-DRGs; and
- the average Medicaid net payment across the 18 MS-DRGs was higher than Medicare for 25 states and lower than Medicare for 22 states.



**FIGURE 4.** Average Medicaid Net Payment Compared to Average Medicare Payment for 18 Selected MS-DRGs



**Note:** Kansas, Maine, and Nebraska were excluded due to missing data. Hawaii was excluded due to insufficient sample size.  
**Source:** MACPAC and Urban Institute analysis of CY 2010 MAX data, CY 2011 CMS-64 financial management report data, GAO survey data (GAO 2014), and FY 2011 Medicare payment data (CMS 2014).

## Conclusions

This analysis shows that Medicaid inpatient hospital payment varies widely both across states and within a state. In addition, overall, Medicaid payment is comparable or higher than Medicare once supplemental payments are taken into account. This finding is similar to analysis of AHA survey data showing Medicaid has paid a greater percentage of costs than Medicare over the past four years (AHA 2016).

The analysis also demonstrates the challenges in making comparisons across states and with another benchmark due to the substantial use of lump-sum supplemental payments by many state Medicaid programs, the variation in use of these payments across states, and variation in how these supplemental payments are financed. The analytic decisions on how to account for these factors greatly affects the results.

Finally, the analysis reinforces MACPAC's longstanding concern about the need for additional payment and financing data at the hospital level. Such data are needed to evaluate the link between payment and access, quality, and value.

## Appendix A: Methods

For this analysis, we worked with researchers from the Urban Institute. To develop the hospital payment index, we used the following data:

- calendar year (CY) 2010 Medicaid Analytic Extract (MAX) eligibility and claims data for inpatient hospital services;
- CY 2010–2012 Centers for Medicare & Medicaid Services (CMS)-64 net financial management reports for information on the amount of supplemental payments made;
- U.S. Government Accountability Office (GAO) survey data on sources of Medicaid financing, including health care related taxes and local government contributions (GAO 2014); and
- CMS fiscal year (FY) 2011 Medicare provider utilization and payment data inpatient public use file to calculate average Medicare payment (CMS 2014).

The analysis focused on fee-for-service (FFS) acute care hospital stays for non-dually eligible, non-elderly enrollees as the MAX data do not include payment information for managed care stays. It is important to note that while managed care has become the dominant delivery system in many states, FFS hospital services still comprise a large portion of total Medicaid benefit spending. In FY 2015, payment for FFS hospital services, including both inpatient and outpatient hospital services, was about 17 percent of total Medicaid benefit spending (MACPAC 2016b).

We excluded enrollees dually eligible for Medicaid and Medicare because most of their claims would have been paid primarily by Medicare. We also excluded those eligible on the basis of age as the majority of these individuals were dually eligible and the remaining population of non-dually eligible aged enrollees resulted in small sample sizes in most states.

We additionally excluded stays from rehabilitation, long-term care, and psychiatric hospitals to further reduce variability across states associated with hospital type. A hospital's facility type was obtained from the CMS Provider of Service (POS) database (CMS 2011a). In cases where a linkage to the CMS POS database could not be made, we used the provider taxonomy code from MAX.

Because states use different payment methodologies to pay for inpatient hospital services (e.g., diagnosis-related groups, per diem, and cost-basis) and billing codes vary across all states, we used the All Patient Refined Diagnosis Related Grouper (APR-DRG) to put all stays into a common classification system. Because Medicare uses a different DRG system—MS-DRGs—for its prospective payment system, we also classified each stay into an MS-DRG for our comparison of Medicaid to Medicare payment.

The payment index was constructed by calculating each state's average payment per stay using the MAX data and applying both wage and case mix adjustments. The wage- and case mix-adjusted average payment per stay for each state was divided by the overall average payment per stay to calculate a payment index value for each state. Adjustments were calculated as follows:



**Wage adjustment.** We computed wage-adjusted payments and wage-adjusted estimated costs to account for expected variation in these measures due to geographical variation in wage rates. We used local wage index data from the CMS Medicare acute inpatient prospective payment system (CMS 2011b). Medicare assigns each hospital a wage index value depending on its geographic area. We matched wage index values by hospital CMS Certification Number (CCN). If a hospital could not be matched by CCN, then it was assigned a wage index value based on the geographic area in which it was located. We used Medicare’s hospital labor share—the share of payments and costs that is estimated to relate to wages—along with the wage index value to apply a wage adjustment to payment and cost values.

**Case mix adjustment.** To adjust for the different mix of enrollees and services being delivered in each state, we applied a case mix adjustment to the average payment per stay. We used a regression model to relate the APR-DRG and demographic variables, such as age and basis of eligibility, to a measure of cost. We used hospital-specific cost-to-charge (CCRs) derived from Medicare cost reports to convert stay-level charges to estimate costs for each stay. We calculated expected cost for each stay and then computed a relative cost measure (relative weight) for each stay by dividing its expected cost by the overall average cost. An overall case mix factor for each state was calculated as the average of the relative weights of the stays in the state.

## Endnotes

<sup>1</sup> MACPAC has compiled state Medicaid payment policies for inpatient hospital services, including how individual states set their payment rates and the various adjustments and supplemental payments that states make. These policies were collected between October and December 2013 and may not reflect the payment policy that was in place during the 2010 period used for this analysis. <https://www.macpac.gov/publication/macpac-inpatient-hospital-payment-landscapes/>.

<sup>2</sup> States have been de-identified in a few tables because we want to draw attention to how states’ relative payment level can vary across the different services or scenarios and not the specific states included as examples.

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