

The Distribution of Provider Relief Payments Among California Health Systems

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Abstract

California Governor Gavin Newsom issued an executive order on March 19, 2020 that effectively prevented hospitals from performing elective procedures to free capacity for a possible surge of COVID-19 patients (order lifted on April 22, 2020). This report examines the financial status of the largest health systems in California, with a particular focus on their liquid assets for financial solvency. It then reports the amount they have received in CARES Act provider relief payments. Overall, 24% of the estimated reduction in net patient revenue was offset by direct CARES Act grants, but the offset varied widely by hospital. The report then presents the correlation between provider relief payments and a hospital's private insurance share of patient revenue, operating margin, and the hospital market concentration of the county in which it resides. We find hospitals with a larger share of net patient revenue from private insurers and hospitals residing in highly concentrated hospital markets received larger payments per adjusted patient day. The results suggest that careful monitoring of future relief payments is needed.

Introduction

Hospitals' financial health has worsened dramatically since the COVID-19 pandemic began. Kaufman Hall's data from over 800 hospitals found that earnings before interest, taxes, depreciation and amortization (EBITDA) operating margins in March 2020 were down 13 percentage points from same time last year (Kaufman Hall, 2020). A report from the American Hospital Association estimated a total financial impact of \$202.6 billion in losses resulting from COVID-19 expenses and lost revenue for hospitals and health systems over the four-month period from March 1 to June 30, 2020 (American Hospital Association, 2020).

California Governor Gavin Newsom issued an executive order on March 19, 2020 that effectively prevented hospitals from performing elective procedures to free capacity for a possible surge of COVID-19 patients (order lifted on April 22, 2020). Researchers have estimated that outpatient services in California dropped by more than 50% and emergency department visits dropped by 40-60% in the 60-day period after the state's shelter-in-place order went into effect on March 19, 2020 (Melnick and Maerki, 2020). The same report estimated total net patient revenue fell by \$3.2 billion per month in the first four months of the pandemic (March - June 2020) -- a 37% reduction from pre-COVID-19 levels.

The Coronavirus Aid, Relief, and Economic Security (CARES) Act and the Paycheck Protection Program and Health Care Enhancement Act provided direct and indirect financial aid to hospitals and health care providers, including accelerated and advanced Medicare payments, Medicare payment increases for COVID-19 patients, the deferral of employer Social Security contributions, as well as -- most importantly for the purposes of this study -- \$175 billion in relief funds in the form of direct grants to hospitals and other health care providers to help alleviate the shortfall in revenues caused by the pandemic.

Payments from the \$50 billion general distribution, the \$12 billion targeted allocation to high impact areas, the \$10 billion targeted allocation to rural providers, and the \$4.9 billion targeted to skilled nursing facilities (\$76.9 billion in total) are being distributed by the Department of Health and Human Services (HHS) through the Health Resources and Services Administration (HRSA). As of July 8, 2020, HRSA has publicly released the provider names and amounts received for \$60.7 billion of the \$76.9 billion (79%) that they are charged with allocating (hereafter, CARES Act payments) (HRSA, 2020). Of this \$60.7 billion, \$4.8 billion has gone to providers with headquarters in California. These CARES Act payments are grants (as opposed to loans) and are the only form of relief payments we analyze in this report.

The purpose of this study is threefold.

- Describe the liquid assets held by the largest (in terms of number of hospitals) health systems in California prior to the COVID-19 pandemic.
- Present the current amount received in CARES Acts payments by each of the largest health systems in California.
- Estimate the association between the CARES Act payment per adjusted patient day received by California hospitals and the share of net patient revenue from private insurers, hospital market concentration, and operating margin.

The Financial Position of California Health Systems Prior to COVID-19

In this section, we report the financial position of the largest health systems in California prior to the COVID-19 pandemic, focusing on cash and cash equivalents and investment securities because these liquid assets could help weather the economic fallout from COVID-19. The value of cash and cash equivalents is relatively stable, and these assets are used to cover short-term obligations. In contrast, the value of investment securities is more volatile, particularly during the COVID-19 pandemic, but these securities are generally liquid and can be used as emergency financial reserves. However, these investment securities are often needed to cover long-term obligations, such as debt payments and retirement benefit payments, but the value of these securities can exceed those obligations.

Tables 1 and 2 report the value of investment securities and cash/cash equivalents, respectively, held by the largest (in terms of number of hospitals) non-profit and for-profit health systems⁵ in California with available financial statements.⁶ The systems are sorted in the tables by the number of hospitals in a system, spanning from Kaiser with 32 to St. Joseph's with 6.

Table 1 presents the value of investment securities — both publicly traded and other securities — held by major non-profit health systems, as reported in their most recent Form 990 statement. The table includes securities held by the entire health system, not just the hospital portion of the system.⁷ When a health system reported multiple Form 990s (e.g., one for their hospitals and one for their medical foundation), we summed the value of investment securities across all forms (see Table A2 in the appendix for the investment security values of each individual form).

Table 2 presents the value of cash and cash equivalents⁸ held by California's largest health systems. For non-profit health systems, we summed cash (non-interest bearing) with savings

⁵ A health system is defined by an organization that owns one or more hospitals.

⁶ Some health systems do not publicly release audited financial statements because they are privately owned.

⁷ For example, investment securities held by Kaiser Foundation Health Plan, Inc. are included in the table under Kaiser Permanente.

⁸ Cash and cash equivalents represent the total cash on hand or in the bank that an organization can easily access; they often include highly liquid investments with maturities of three months or less.

and temporary cash investments reported on the Form 990.⁹ When a health system reported multiple Form 990s (e.g., one for their hospitals and one for their medical foundation), we summed the value of cash and cash equivalents across all forms (see Table A3 in the appendix for the cash and cash equivalent values of each individual form). For publicly traded health systems, we used cash and cash equivalents reported on the Form 10-K. For the Regents of the University of California¹⁰ and Prime Healthcare Services, Inc. we also used cash and cash equivalents reported in their annual financial reports.

Table 1 shows that the value of investment securities held by the largest non-profit health systems in California ranges from \$28.2 billion for Kaiser Permanente to \$319 million for Prime Healthcare Services Foundation. Kaiser Permanente, the largest health system, holds almost six times the value in investment securities than the next largest system, Sutter Health. However, Kaiser does not stand out in the same way when examining the value of cash and cash equivalents reported in Table 2. Kaiser has less cash on hand than other health systems, partly because it invested in securities instead. When investment securities and cash and cash equivalents are summed, Kaiser still leads and is followed by Dignity Health (also known as CommonSpirit Health¹¹ after its merger with Catholic Health Initiatives).

⁹ Non-profit health systems and their subsidiaries report their financial information in Form 990s whereas publicly traded for-profit health systems report their information in Form 10-Ks. The line items and reporting requirements slightly differ between the forms, but the asset measures were substantively similar.

¹⁰ The Regents of the University of California is not subject to non-profit public corporation law and is not required to file a Form 990. The reported values are held by the University of California Medical Centers and medical groups.

¹¹ CommonSpirit Health assets were not included.

Table 1. Value of Investment Securities Held by the Largest Non-profit Health Systems in California

Health system (# hospitals in California)	Value of Investment Securities
Kaiser Permanente (32)	\$28,230,766,909
Dignity Health (25)	\$3,500,134,737
Sutter Health (25)	\$4,918,757,431
Adventist Health (14)	\$1,322,838,504
Regents of the University of California (8)*	\$345,274,000
Prime Healthcare Services Foundation, Inc. (6)**	\$319,663,601
Sharp Healthcare Corporation (6)	\$2,646,797,295
St. Joseph Health System (6)	\$619,067,107

Source: Most recent Form 990 filings for non-profit health systems (FY 2018 or 2017); University of California Medical Centers 18/19 Annual Financial Report

Notes: *The Regents of the University of California is considered a non-profit by OSHPD, but is not subject to non-profit public corporation law and is not required to file a Form 990. The value recorded here was reported as short term investments in the Regents' annual report.

**This excludes the seven for-profit Prime hospitals in California (see Prime Healthcare Services, Inc. in Table 2).

The securities held by these systems include entities outside of California. The health systems and their subsidiaries report three line items for investments that include publicly traded securities, other securities, and program related investments. We excluded the program related investments and only included investments in the form of securities. For health systems with multiple organizations (e.g. hospitals and medical foundations) filing a Form 990, securities were summed across the system's associated organizations. The detailed breakdown is available in the appendix.

Table 2. Value of Cash and Cash Equivalents Held by the Largest Health Systems in California

Health system (# hospitals in California)	Value of Cash and Cash Equivalents
Kaiser Permanente (32)	\$391,175,900
Dignity Health (25)	\$2,531,136,519
Sutter Health (25)	\$409,124,711
Adventist Health (14)	\$496,239,499
Prime Healthcare (13)*	\$298,069,527
Tenet Healthcare Corporation (12)	\$411,000,000
Kindred Healthcare, Inc. (10)	\$160,254,000
Universal Health Services, Inc. (10)	\$105,220,000
Regents of the University of California (8)	\$3,677,198,000
Sharp Healthcare Corporation (6)	\$432,041,888
St. Joseph Health System (6)	\$158,304,699

Source: Most recent Form 990 filings for non-profit health systems (FY 2018 or 2017); SEC Form 10-K for publicly traded health systems (FY 2018 for Tenet Healthcare Corporation and Universal Health Services, Inc.; FY 2017 for Kindred Healthcare, Inc.); University of California Medical Centers 18/19 Annual Financial Report, Prime Healthcare Services, Inc. Consolidated Financial Statements (2018)

Notes: *Prime Healthcare includes the six non-profit Prime hospitals in California (see Prime Healthcare Services Foundation, Inc. in Table 1) and the seven for-profit Prime hospitals (Prime Healthcare Services, Inc.).

Table 3 presents the days of cash on hand and days of cash and investment securities on hand for the same health systems as above. Days of cash on hand is a measure of financial solvency, representing the number of days an organization can pay its expenses with existing cash (see Equation 1) (Upadhyay and Smith, 2016). Because investment securities are generally liquid and a portion may consist of a combination of excess working capital and long-term reserves, we also included them in a second measure of financial solvency, which we called days of cash and investment securities on hand (see Equation 2). However, these investment securities are often needed to cover long-term obligations, such as debt payments and retirement benefit payments. In the equations, cash on hand equaled cash and cash equivalents (as discussed above). Operating functional expenses equaled total functional expenses less non-cash expenses, including depreciation, depletion and amortization. Optum is a health information technology and services firm that publishes financial and operating statistics and benchmarks and indicators as well as financial statistics on the nation's hospitals in the United States. In 2015, the median hospital in the Optum sample had 27 days of cash on hand from short term sources (Nowicki, 2018).

$$(1) \frac{\text{Cash on hand}}{\text{Operating functional expenses} / 365}$$

$$(2) \frac{\text{Cash on hand} + \text{Investment Securities}}{\text{Operating functional expenses} / 365}$$

In Table 3, the days of cash on hand ranges from a high of 180 days for Tenet Healthcare Corporation to a low of 2 days for Kaiser Permanente. The striking part of Table 3 is that 7 of the 11 hospital systems are significantly above the Optum median of 27 days of cash on hand ranging from Prime Healthcare being 35% above to Tenet Healthcare Corporation being 558% above. When investment securities are included, then these systems' solvency situation improves even more.

Table 3. Days of Cash and Investment Securities on Hand at the Largest Health Systems in California

Health System (# hospitals in California)	Total Days of Cash on Hand (DCOH)	Total Days of Cash and Securities on Hand	% Above Median DCOH
Kaiser Permanente (32)	2	127	-93%
Dignity Health (25)	92	220	237%
Sutter Health (25)	12	150	-56%
Adventist Health (14)	145	579	429%
Prime Healthcare (13)*	37	153	35%
Tenet Healthcare Corporation (12)	180	198	558%
Kindred Healthcare, Inc. (10)**	10	11	-65%
Universal Health Services, Inc. (10)***	4	11	-85%
Regents of the University of California (8)	105	115	285%
Sharp Healthcare Corporation (6)	42	298	53%
St. Joseph Health System (6)	44	217	61%
Optum Financial and Operating Indicators for the Nation's Hospitals -- Median Days of Cash on Hand (DCOH)	27		

Source: SEC 10-K reports (2017, 2018); Form 990 filings (2017, 2018); University of California Medical Centers 18/19 Annual Financial Report, Prime Healthcare Services, Inc. Consolidated Financial Statements (2018)

Notes: *Total securities were not listed explicitly; instead, short term investments were used as a proxy

**Total securities were not listed explicitly; instead, insurance subsidiary investments were used.

***Total securities were not listed explicitly; instead, "other current assets" were used.

For health systems with multiple organizations filing a Form 990, cash on hand, investment securities, and operating functional expenses were summed across the system's associated organizations. See Table A3 in the appendix for the specific breakdown.

Provider Relief Payments to California Health Systems

Of the \$60.7 billion in CARES Act payments that has been allocated, \$4.8 billion was paid to medical providers with headquarters in California. Table 4 shows the total HRSA provider relief payments (as of July 8, 2020) to the largest health systems in California (HRSA, 2020). The payments listed in Table 4 are broken out by whether the payments were directed to a system's hospitals or medical foundations. Payments to systems that span beyond California are multiplied by the share of the system's beds in California. For instance, Dignity Health received \$400 million in CARES Act payments, but only 79% of its hospital beds were in California with the remainder in Arizona and Nevada.¹² Thus, the total payment shown in Table 4 for Dignity Health is \$315 million (79% of \$400 million).¹³

The \$50 billion in general distribution payments -- the large majority of the payments assigned to HRSA to distribute -- was allocated based on net patient revenue. Specifically, the payments were intended to be the lesser of 2% of a provider's 2018 (or most recent complete tax year) net patient revenue or the sum of incurred losses for March and April 2020. Providers had to bill Medicare fee-for-service in order to qualify.

The systems in Table 4 represent the largest systems in California in terms of number of hospitals. The systems are sorted in the table from the system with the most hospitals (Kaiser with 32) to the fewest (St. Joseph's with 6). The Regents of the University of California received the most in CARES Act payments at \$361 million, Sutter Health received the second most at \$317 million, and Dignity Health received the third most at \$315 million. Four systems -- Kaiser, Kindred, Telecare, and Signature -- did not receive any CARES Act payments because they did not bill Medicare on a fee-for-service basis.¹⁴

¹² This is prior to the merger of Dignity Health and Catholic Health Initiatives in 2019 that created CommonSpirit Health.

¹³ Specifically, $\$399,715,788 * 0.787309 = \$314,699,837$.

¹⁴ Table 4 shows only grants. The total amount of loans (attributable to California) received by the systems listed in Table 4 was \$3.9 billion.

Table 4. CARES Act Payments to 10 Largest Health Systems in California

Health system (# hospitals in California)	Grant payment to CA hospitals	Grant payment to CA medical foundations	Total grant payment
Kaiser Permanente (32)	\$0	\$0	\$0
Dignity Health (25)	\$308,529,542	\$6,170,296	\$314,699,837
Sutter Health (25)	\$231,169,995	\$85,666,041	\$316,836,036
Adventist Health (14)	\$88,642,003	\$1,799,710	\$90,441,713
Tenet Healthcare Corporation (12)	\$109,361,005	\$0	\$109,361,005
Kindred Healthcare, Inc. (10)	\$0	\$0	\$0
Universal Health Services, Inc. (10)	\$129,119,020	\$0	\$129,119,020
Regents of the University of California (8)	\$360,856,403	\$0	\$360,856,403
State of California (8)	\$10,698,393	\$0	\$10,698,393
Prime Healthcare Services, Inc. (7)	\$191,032,312	\$0	\$191,032,312
Sharp Healthcare Corporation (6)	\$82,236,971	\$0	\$82,236,971
St. Joseph Health System (6)	\$93,476,147	\$7,343,875	\$100,820,022

Source: COVID Stimulus Watch, Good Jobs First (payments, accessed July 8, 2020); American Hospital Association (AHA) Annual Survey Database (fraction of beds)

Notes: The payment listed was calculated by multiplying the payment to hospitals of a health system by the fraction of a health system's beds in California. The listed payment to Sutter Health's medical foundations includes the payment to Sutter Visiting Nurse Association and Hospice. The table shows only money received as grants. The total amount of loans (attributable to California) received by the systems listed in the table is \$3.9 billion.

An Analysis of Factors Correlated with Provider Relief Payments

The implication of the decision to allocate funding based on total net patient revenue has been analyzed on a national level by the Kaiser Family Foundation (KFF) (Schwartz and Damico, 2020). The KFF study found that the hospitals in the top 10% based on the percent of patient revenue from private insurance received \$44,321 per hospital bed, more than double the \$20,710 per hospital bed for hospitals in the bottom 10%. The study also found that hospitals with the highest share of private insurance revenue also had higher operating margins (4.2% vs. -9.0%) and provided less uncompensated care as a share of operating expenses (7.0% vs. 9.1%).

In what follows we conduct similar analyses to those in the KFF study, but focus on hospitals in California. Specifically, we estimate a multivariate regression model that regresses a hospital's payment per adjusted patient day on its private insurance share of net patient revenue, hospital market concentration, and operating margin (see the statistical framework section of the appendix for details). For payments that went to a system (rather than individual hospitals), we allocated payments to individual hospitals based on each hospital's share of its system's net patient revenue. Only hospital payments to a system (as opposed to payments to its medical foundation or other entities) are considered, and only general acute care hospitals are included in our analysis. Our analytic sample includes 254 of California's 334 general acute care hospitals.¹⁵

To compare payments across systems, an appropriate denominator is needed. We used an adjusted patient day, which incorporates both inpatient admissions and outpatient visits into a system-level measure of volume while also controlling for differences in the severity of the cases that each system handles.¹⁶ Data from California's Office of Statewide Health Planning and Development (OSHPD) was used to calculate both system volume and case mix.¹⁷

Figure 1 shows the correlation between a system's private insurance share of net patient revenue and payment per adjusted patient days (see the statistical framework section of the appendix for the regression coefficient estimates from which the figure was derived). All variables in the model that are not plotted were set to their sample averages. The dotted red line in the figure shows that the average payment per adjusted day to hospitals was \$164. The solid blue line shows how hospital payments varied according to their level of private insurance share of net patient revenue. Hospitals on the low end with a 15% private insurance share (roughly the 25th percentile of the sample) were predicted to receive payments of \$123 -- or \$41 (or 25%) below the overall average of \$164. Hospitals on the high end with a 45% private insurance

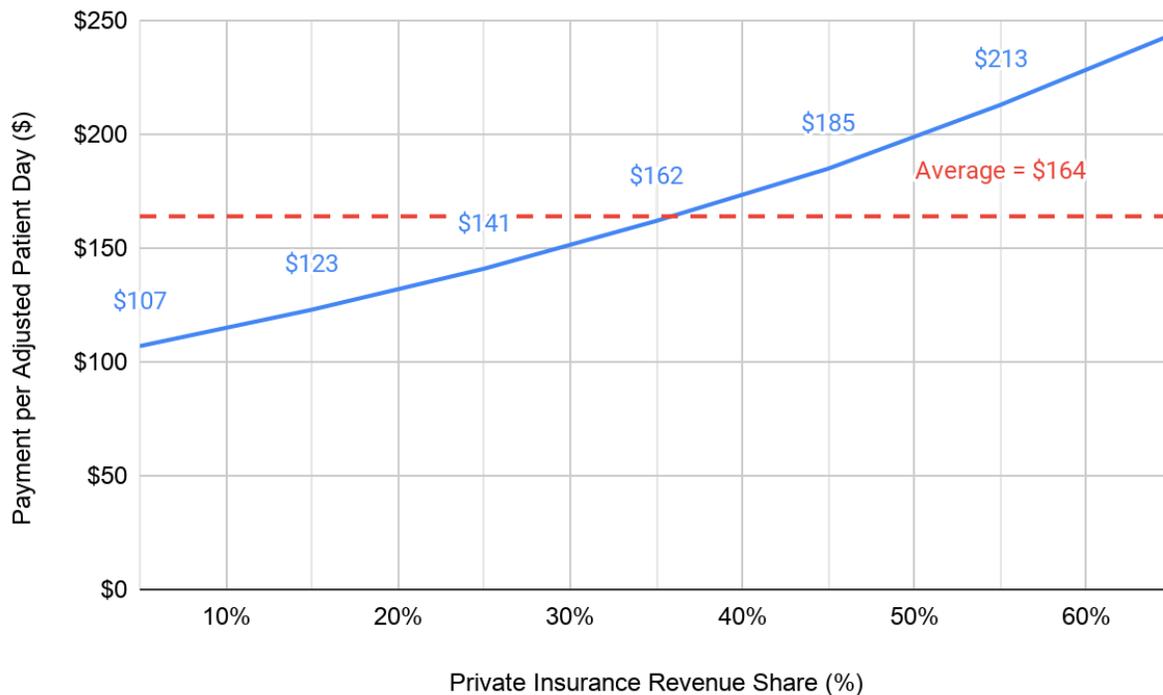
¹⁵ Notably all Kaiser hospitals are excluded as the system did not receive CARES Act payments.

¹⁶ Specifically, adjusted patient days = inpatient days * (gross patient revenue / gross inpatient revenue) * case mix index.

¹⁷ OSHPD's Hospital Annual Financial Data FY 2018-2019 (<https://data.chhs.ca.gov/dataset/hospital-annual-financial-disclosure-report-complete-data-set>) and Case Mix data (<https://data.chhs.ca.gov/dataset/case-mix-index>).

share (roughly the 75th percentile of the sample) were predicted to receive payments of \$185 -- or \$21 (or 13%) above the overall average of \$164.

Figure 1. Correlation between Private Insurance Share and Payment per Adjusted Patient Day



Source: Authors' analysis of the HRSA Provider Relief Fund Dataset (<https://data.cdc.gov/Administrative/HHS-Provider-Relief-Fund/kh8y-3es6>, Accessed July 8, 2020) and OSHPD's Hospital Annual Financial Data FY 2018-2019 (<https://data.chhs.ca.gov/dataset/hospital-annual-financial-disclosure-report-complete-data-set>) and Case Mix data (<https://data.chhs.ca.gov/dataset/case-mix-index>).

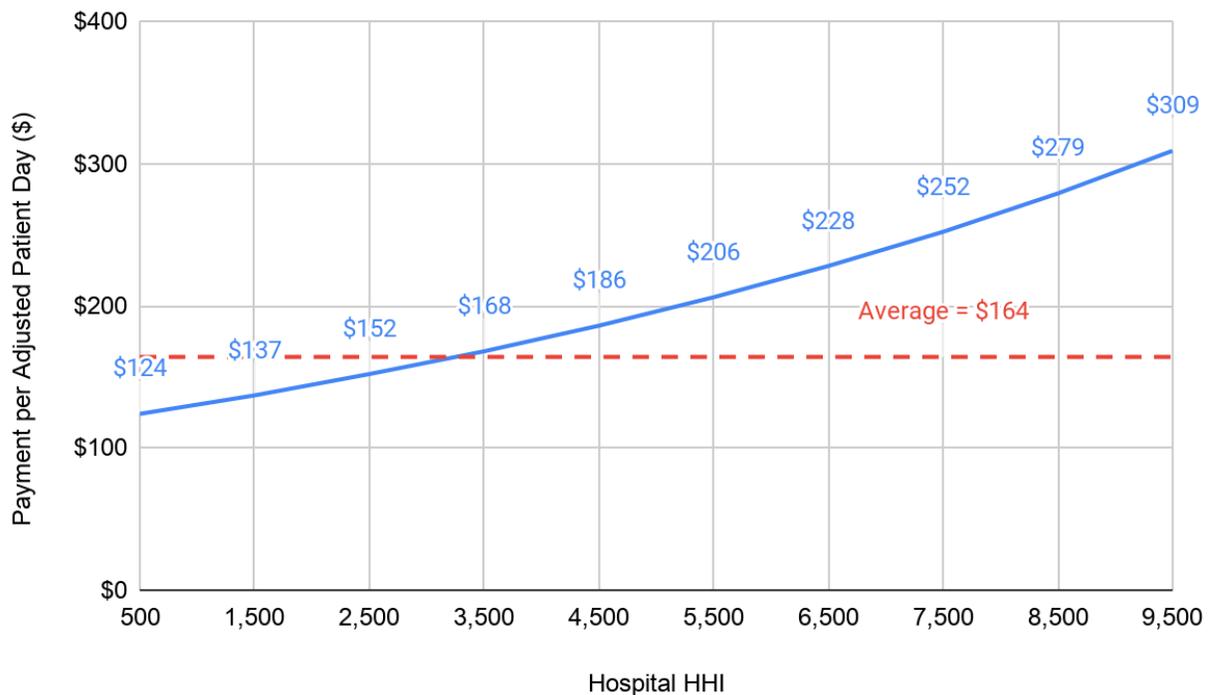
Notes: The values shown in the figure were calculated from the regression coefficients shown in the statistical framework section of the appendix. The range of the horizontal axis roughly matches the range observed in the data. All independent variables in the model other than private insurance revenue share are set to their sample averages. The predicted values resulting from the model were exponentiated in order to report the payments in levels. Adjusted patient days = inpatient days * (gross patient revenue / gross inpatient revenue) * case mix index.

Figure 2 shows the correlation between hospital market concentration (measured at the county-level) and payment per adjusted patient days (see the statistical framework section of the appendix for the regression coefficient estimates from which the figure was derived).

The Herfindahl-Hirschman Index (HHI) is a frequently used measure of market concentration that ranges from 0 to 10,000. It is calculated by summing the squared market shares of firms in a market. Each system's share of admissions in a county served as the market shares for our calculations. For instance, a market with two hospitals that each account for 50% of a market's admissions would have an HHI of 5,000 (50^2+50^2).

The U.S. Department of Justice and Federal Trade Commission (DOJ/FTC) consider markets with HHIs below 1,500 to be unconcentrated, between 1,500 and 2,500 to be moderately concentrated, and above 2,500 to be highly concentrated (DOJ/FTC, 2010). Figure 2 shows that payments per adjusted day varied considerably by hospital HHI. Hospitals in unconcentrated markets with an HHI of 1,500 (roughly the 25th percentile of the sample) were predicted to receive payments of \$137 -- or \$27 (or 16%) below the overall average of \$164. Hospitals in highly concentrated markets with an HHI of 4,500 (roughly the 75th percentile of the sample) were predicted to receive payments of \$186 -- or \$22 (or 13%) above the overall average of \$164.

Figure 2. Correlation between Hospital HHI and Payment per Adjusted Patient Day

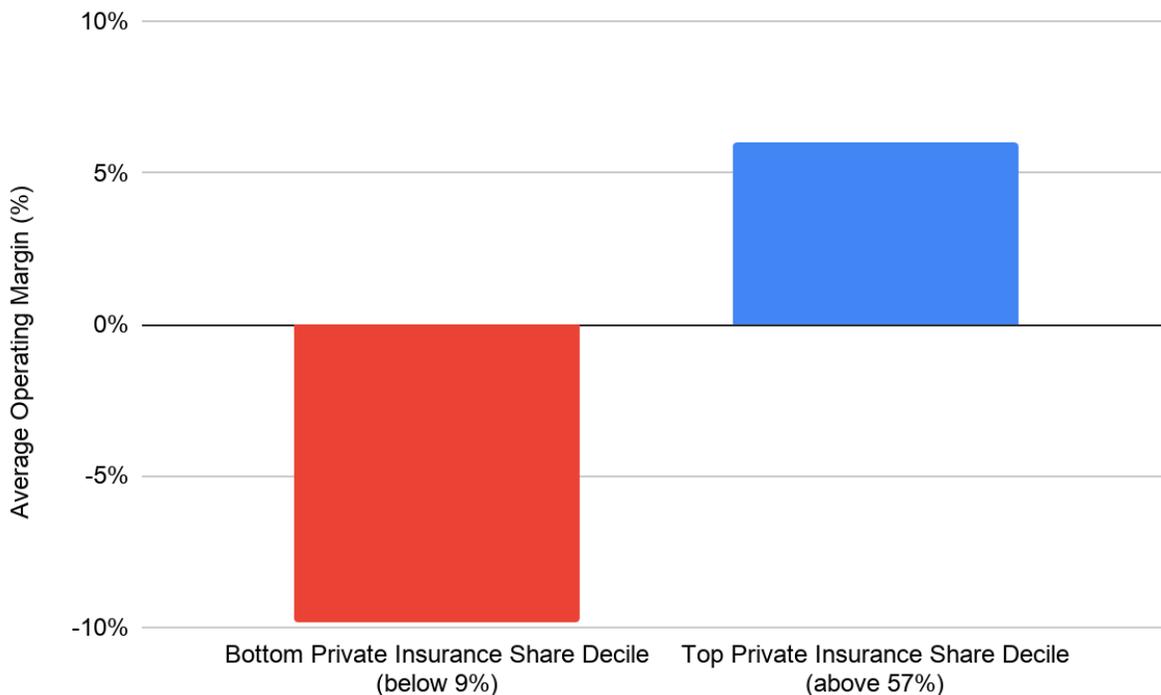


Source: Authors' analysis of the HRSA Provider Relief Fund Dataset (<https://data.cdc.gov/Administrative/HHS-Provider-Relief-Fund/kh8y-3es6>, Accessed July 8, 2020), OSHPD's Hospital Annual Financial Data FY 2018-2019 (<https://data.chhs.ca.gov/dataset/hospital-annual-financial-disclosure-report-complete-data-set>) and Case Mix data (<https://data.chhs.ca.gov/dataset/case-mix-index>), and the American Hospital Association's Annual Survey Database. Notes: HHI=Herfindahl-Hirschman Index. The values shown in the figure were calculated from the regression coefficients shown in the statistical framework section of the appendix. The range of the horizontal axis roughly matches the range observed in the data. All independent variables in the model other than hospital HHI are set to their sample averages. The predicted values resulting from the model were exponentiated in order to report the payments in levels. Adjusted patient days = inpatient days * (gross patient revenue / gross inpatient revenue) * case mix index.

We did not find a statistically significant association between payment per adjusted patient day and a system's operating margin (see the statistical framework section of the appendix for the regression coefficient estimate). That is, a hospital's operating margin does not provide any additional explanatory power beyond what is provided by a hospital's private insurance share of

net patient revenue and the hospital market concentration of the county in which it resides. We do, however, observe the same pattern in the data that the aforementioned KFF study found (Schwartz and Damico, 2020). That is, hospitals with larger private insurance shares of net patient revenue also had larger operating margins. Specifically, hospitals in the top decile in terms of private insurance share (i.e., above 57%) had an average operating margin of 6%, whereas hospitals in the bottom decile share (i.e., below 9%) had an average operating margin of -10% (Figure 3).

Figure 3. Average Operating Margin of Hospitals in the Top and Bottom Decile of Private Insurance Share of Net Patient Revenue



Source: Authors' analysis of OSHPD's Hospital Annual Financial Data FY 2018-2019.

Melnick and Maerki (2020) estimate that the net patient revenues of general hospitals in California fell by 37% over the first four months of the pandemic. Applying 37% to four months of net patient revenue for each of the hospitals in our sample leads to a total loss of \$11.4 billion over the first four months of the pandemic. This estimate of \$11.4 billion should be viewed as a ballpark estimate as we are assuming every hospital in our sample would experience the same 37% reduction in net patient revenue.

As the total hospital-portion of CARES Act payments received by the 254 hospitals in our sample was \$2.7 billion, we estimate CARES Act payments covered only 24% (2.7 billion divided by 11.4 billion) of the total net patient revenue loss. However, there was considerable

variation across the hospitals in our sample. The median percent of the decrease in net patient revenue covered was 20%, while the 25th percentile was 16% and the 75th percentile was 29%.

Discussion

California Governor Gavin Newsom's executive order on March 19, 2020 prevented hospitals from delivering elective procedures so that they could act in the public interest to expand their capacity to treat COVID-19 patients (order lifted on April 22, 2020). Not surprisingly, the order had a significant impact on hospital finances. A "ballpark" estimate suggests that the 254 general hospitals in our sample experienced a decrease in net patient revenue of \$11.4 billion through the end of June. As of July 8, 2020, these hospitals received \$2.7 billion of CARES Act payments, accounting for 24% of the decrease in net patient revenue. We found enormous variation in the amount that the hospitals included in our sample received. The median percent of the decrease in net patient revenue covered was 20%, while the 25th percentile was 16% and the 75th percentile was 29%.

Based on financial reports prior to the pandemic, we found 7 of the 11 largest health systems in California had more than 27 days of cash on hand (the median number of days across hospitals in the United States), ranging from 35% to 558% above the median. The largest health systems in California appear to have many days of cash on hand, particularly Tenet Healthcare Corporation and Adventist Health which ranked #1 and #2, respectively. When investment securities are included, then these and the other systems' solvency situation improves even more, as investment securities are generally liquid and a portion may consist of a combination of excess working capital and long-term reserves. However, these investment securities are often needed to cover long-term obligations, such as debt payments and retirement benefit payments, but the value of these securities can exceed those obligations.

Our analysis shows that the size of the provider relief payments per adjusted patient day varied significantly, which was correlated with a hospital's share of net patient revenue from private insurers and the hospital market concentration in the county that the hospital operates in. This result could be due to hospitals in highly concentrated markets being able to extract higher prices from private insurers, which leads to higher patient revenue and larger CARES Act payments because the formula used to allocate the \$50 billion general distribution was based on a hospital's net patient revenue.¹⁸ Previous work in California has shown that hospitals with more market power can negotiate higher reimbursement rates from private insurers (Scheffler et al., 2019; Scheffler et al., 2018).

Though the final financial impact of the governor's order to shut down elective procedures will not be known for several more months, it seems clear that the distribution of funds favored hospitals with a high private insurance share of patient revenue and those located in highly

¹⁸ As a reminder, the \$50 billion in general distribution payments -- the large majority of the payments assigned to HRSA to distribute -- was allocated based on net patient revenue. Specifically, the payments were intended to be the lesser of 2% of a provider's 2018 (or most recent complete tax year) net patient revenue or the sum of incurred losses for March and April 2020.

concentrated markets. Federal and state policymakers, regulators, and legislators should carefully monitor the allocation of these funds for equity concerns in addition to ensuring adequate hospital capacity for surges in COVID-19 cases and a second wave of the virus.

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Appendix

Statistical Framework

Figures 1 and 2 in the main report were produced using the regression coefficient estimates from the following model.

$$(1) \ln(\text{payment per adj. patient day})_{ic} = \beta_0 + \beta_1 \text{PrivInsShare}_{ic} + \beta_2 \text{HospHHI}_c + \beta_3 \text{OM}_{ic} + \epsilon_{ic},$$

Where $\ln(\text{payment per adj. patient day})_i$ is the natural log of the payment per adjusted patient day received by hospital i in county c , PrivInsShare_{ic} is the share of a hospital's net patient revenue that comes from private insurers, HospHHI_c is the hospital market concentration of the county in which the hospital resides, and OM_{ic} is the operating margin of the hospital.

We defined an adjusted patient day as inpatient days multiplied by the ratio of gross patient revenue to gross inpatient revenue multiplied by a system's case mix index. Multiplying inpatient days by the ratio of gross patient revenue to gross inpatient revenue is used to include outpatient visits in the measure of a system's volume while multiplying by a system's case mix index is used to account for differences in the severity of the cases that each system handles. Data from California's Office of Statewide Health Planning and Development (OSHPD) was used to calculate both system volume and case mix.¹⁹

The coefficient estimates that result from estimating equation (1) are shown in Table A1. The estimates for both the private insurance and hospital HHI variables are positive and statistically significant. The private insurance coefficient is interpreted as a 1 percentage point increase in a hospital private insurance share of net patient revenue is correlated with a 1.36% increase in its payment per adjusted patient day. The hospital HHI coefficient can be interpreted as a 1,000 point increase in the hospital HHI of the county in which a hospital resides is correlated with a 10% increase in a hospital's payment per adjusted patient day.

The model has the same standard limitations for models estimated on a single cross-section of data. First, these estimates should be viewed as correlations rather than a statement of any causal relationship between the independent variables and payments per adjusted patient day. Second, omitted variable bias is a concern as is often the case for cross-sectional models. For instance, the estimates would be biased if omitted variables are correlated with both the independent variables and payments per adjusted day.

¹⁹ OSHPD's Hospital Annual Financial Data FY 2018-2019 (<https://data.chhs.ca.gov/dataset/hospital-annual-financial-disclosure-report-complete-data-set>) and Case Mix data (<https://data.chhs.ca.gov/dataset/case-mix-index>).

Table A1. Payment per Adjusted Patient Day Regression Coefficient Estimates

	ln(payment per adj. patient day (\$))
PrivInsShare (%)	0.0136*** (0.0048)
HospHHI	0.00010*** (0.000033)
OM (%)	-0.0061 (0.0068)
No. of Obs.	254
R2	0.068

Source: Authors' analysis of the HRSA Provider Relief Fund Dataset (<https://data.cdc.gov/Administrative/HHS-Provider-Relief-Fund/kh8y-3es6>, Accessed July 8, 2020), OSHPD's Hospital Annual Financial Data FY 2018-2019 (<https://data.chhs.ca.gov/dataset/hospital-annual-financial-disclosure-report-complete-data-set>) and Case Mix data (<https://data.chhs.ca.gov/dataset/case-mix-index>), and the American Hospital Association's Annual Survey Database. Notes: ln=natural log. HHI=Herfindahl-Hirschman Index. Adjusted patient days = inpatient days * (gross patient revenue / gross inpatient revenue) * case mix index. Robust standard error in parentheses. *** p<0.01 ** p<0.05 *p<0.1

When a health system reported multiple Form 990s (e.g., one for their hospitals and one for their medical foundation), we summed the values of investment securities, which are individually reported in Table A2.

Table A2. Value of Investment Securities Held by the Largest California Health Systems as Reported by Individual Form 990 Filers

Health System (# hospitals in California)	Individual Form 990 Filer	Publicly Traded Securities	Other securities
Kaiser Permanente (32)	Kaiser Foundation Health Plan Inc	\$9,015,504,061	-
Kaiser Permanente (32)	Kaiser Foundation Hospitals	\$19,215,262,848	-
Dignity Health (25)	Dignity Health	\$1,653,637,170	\$1,846,497,567
Sutter Health (25)	Sutter Health	\$4,270,231,700	\$408,573,041
Sutter Health (25)	Sutter Bay Hospitals	\$106,993,333	-
Sutter Health (25)	Sutter Valley Hospitals	\$3,176,955	-
Sutter Health (25)	Sutter Bay Medical Foundation	\$62,608,938	-
Sutter Health (25)	Sutter Valley Medical Foundation	\$571,022	-
Sutter Health (25)	Sutter Medical Center Foundation	\$39,311,039	-
Sutter Health (25)	Sutter Roseville Medical Center Foundation	\$3,841,761	-
Sutter Health (25)	Sutter Auburn Faith Hospital Foundation	\$3,765,653	-
Sutter Health (25)	Sutter Visiting Nurse Association and Hospice	\$17,965,165	-
Sutter Health (25)	Sutter Davis Hospital Foundation and Community Board	\$1,718,824	-
Adventist Health (14)	Glendale Adventist Medical Center	\$4,418,324	-
Adventist Health (14)	Glendale Adventist Medical Center Foundation	\$1,666,509	-
Adventist Health (14)	St. Helena Hospital	\$5,362,721	-
Adventist Health (14)	Adventist Health Clearlake Hospital Inc.	\$1,459,887	-

Adventist Health (14)	Adventist Health Medical Center Tehachapi	\$979,482	-
Adventist Health (14)	Castle Medical Center	\$12,460,040	-
Adventist Health (14)	Adventist Health Physicians Network	\$18,143	-
Adventist Health (14)	Adventist Health System-West	\$1,239,166,048	-
Adventist Health (14)	Adventist Health Delano	\$57,307,350	-
Prime Healthcare Services Foundation, Inc. (6)*	Prime Healthcare Foundation Inc	\$238,701,068	\$80,962,533
Sharp Healthcare Corporation (6)	Sharp Healthcare	\$2,037,437,165	\$11,627,684
Sharp Healthcare Corporation (6)	Sharp Healthcare Foundation	\$39,169,173	-
Sharp Healthcare Corporation (6)	Sharp Chula Vista Medical Center	\$92,765,218	\$2,120,974
Sharp Healthcare Corporation (6)	Sharp Memorial Hospital	\$848,348	-
Sharp Healthcare Corporation (6)	Grossmont Hospital Corporation	\$446,779,842	\$1,088,348
Sharp Healthcare Corporation (6)	Grossmont Hospital Foundation	\$14,960,543	-
St. Joseph Health System (6)	St Joseph Health System	\$207,255,885	\$21,751,986
St. Joseph Health System (6)	St Joseph Health Northern California LLC	\$386,179,229	\$3,880,007

Source: Most recent Form 990 filing (FY 2018 or 2017)

Notes: *This row excludes the seven for-profit Prime hospitals in California. The numbers above include investment securities held by hospitals and medical centers as well as medical foundations.

When a health system reported multiple Form 990s (e.g., one for their hospitals and one for their medical foundation), we summed the values of cash and cash equivalents, investment securities, and operating functional expenses across all forms, which are individually reported in Table A3.

Table A3. Cash and Investment Securities on Hand by Individual Form 990 Filers of the Largest California Non-profit Health Systems

Health System (# hospitals in California)	Individual Form 990 Filer	Cash on hand	Cash and securities on hand	Operating functional expenses	Days of cash on hand	Days of cash and securities on hand
Kaiser Permanente (32)	Kaiser Foundation Health Plan Inc	\$73,158,407	\$9,088,662,468	\$57,795,115,209	0	57
Kaiser Permanente (32)	Kaiser Foundation Hospitals	\$318,017,493	\$19,533,280,341	\$24,283,128,543	5	294
Dignity Health (25)	Dignity Health	\$2,531,136,519	\$6,031,271,256	\$10,015,994,871	92	220
Sutter Health (25)	Sutter Health	\$67,191,642	\$4,745,996,383	\$1,674,050,017	15	1035
Sutter Health (25)	Sutter Bay Hospitals	\$6,053,048	\$113,046,381	\$3,804,067,748	1	11
Sutter Health (25)	Sutter Valley Hospitals	\$45,877,865	\$49,054,820	\$2,986,095,582	6	6
Sutter Health (25)	Sutter Bay Medical Foundation	\$192,712,180	\$255,321,118	\$2,660,760,934	26	35
Sutter Health (25)	Sutter Valley Medical Foundation	\$89,621,827	\$90,192,849	\$1,499,337,886	22	22
Sutter Health (25)	Sutter Medical Center Foundation	\$3,562,428	\$42,873,467	\$5,840,872	223	2679
Sutter Health (25)	Sutter Roseville Medical Center Foundation	\$667,827	\$4,509,588	\$2,635,121	93	625

Sutter Health (25)	Sutter Auburn Faith Hospital Foundation	\$504,720	\$4,270,373	\$938,355	196	1661
Sutter Health (25)	Sutter Visiting Nurse Association and Hospice	\$2,728,063	\$20,693,228	\$350,307,421	3	22
Sutter Health (25)	Sutter Davis Hospital Foundation and Community Board	\$205,111	\$1,923,935	\$692,797	108	1014
Adventist Health (14)	Glendale Adventist Medical Center	\$57,091,562	\$61,509,886	\$440,913,768	47	51
Adventist Health (14)	Glendale Adventist Medical Center Foundation	\$6,110,287	\$7,776,796	\$2,569,165	868	1105
Adventist Health (14)	St. Helena Hospital	\$29,757,925	\$35,120,646	\$248,323,032	44	52
Adventist Health (14)	Adventist Health Clearlake Hospital Inc.	\$17,880,555	\$19,340,442	\$95,780,921	68	74
Adventist Health (14)	Adventist Health Medical Center Tehachapi	\$1,799	\$981,281	\$26,585,140	0	13
Adventist Health (14)	Castle Medical Center	\$104,905,838	\$117,365,878	\$165,461,407	231	259
Adventist Health (14)	Adventist Health Physicians Network	\$3,257	\$21,400	\$136,642,548	0	0
Adventist Health (14)	Adventist Health System-West	\$250,128,638	\$1,489,294,686	\$350,939,484	260	1549

Adventist Health (14)	Adventist Health Delano	\$30,359,638	\$87,666,988	\$81,998,352	135	390
Prime Healthcare Services Foundation, Inc. (6)*	Prime Healthcare Foundation Inc	\$103,543,527	\$423,207,128	\$1,008,609,894	37	153
Sharp Healthcare Corporation (6)	Sharp Healthcare	\$347,412,785	\$2,396,477,634	\$1,562,962,299	81	560
Sharp Healthcare Corporation (6)	Sharp Healthcare Foundation	\$2,481,684	\$41,650,857	\$15,300,688	59	994
Sharp Healthcare Corporation (6)	Sharp Chula Vista Medical Center	\$1,328,929	\$96,215,121	\$408,297,015	1	86
Sharp Healthcare Corporation (6)	Sharp Memorial Hospital	\$3,794,086	\$4,642,434	\$1,067,104,680	1	2
Sharp Healthcare Corporation (6)	Grossmont Hospital Corporation	\$72,235,094	\$520,103,284	\$710,435,820	37	267
Sharp Healthcare Corporation (6)	Grossmont Hospital Foundation	\$4,789,310	\$19,749,853	\$4,787,868	365	1506
St. Joseph Health System (6)	St Joseph Health System	\$135,717,358	\$364,725,229	\$492,207,428	101	270
St. Joseph Health System (6)	St Joseph Health Northern California LLC	\$22,587,341	\$412,646,577	\$813,555,515	10	185

Source: Most recent Form 990 filings (FY 2018 or 2017)

Notes: *This row excludes the seven for-profit Prime hospitals in California, as this expanded table includes only Form 990 filing organizations. The for-profit Prime hospitals were included in the summed value of Table 3. The numbers above include investment securities held by hospitals and medical centers as well as medical foundations.