

U.S. Hospitals' Administrative Expenses Increased Sharply During COVID-19



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ABSTRACT

BACKGROUND: In response to the declining utilization and patient revenue due to the COVID-19 pandemic, the U.S. hospital industry furloughed at least 1.4 million health care workers to contain their clinical-related expenses. However, it remains unclear how hospitals responded by adjusting their administrative expenses, which account for more than a quarter of U.S. hospitals' spending, a proportion substantially higher than that of other industrialized countries. Examining changes in hospitals' administrative expenses during the COVID-19 pandemic is important for understanding hospitals' cost-containment behaviors under operational shocks during a pandemic.

OBJECTIVE: To assess changes in hospitals' administrative expenses and clinical expenses during the COVID-19 pandemic in 2020.

DESIGN: Time-series observational study.

PARTICIPANTS: 1420 Medicare-certified general acute-care hospitals with fiscal years starting in January and continuously operating during 2016–2020.

MAIN MEASURES: Hospitals' annual administrative expenses and clinical expenses.

KEY RESULTS: Hospitals' median administrative and clinical expenses both increased consistently around 4% each year from 2016 to 2019. From 2019 to 2020, the median administrative expenses grew by 6.2% while the median clinical expenses grew by 0.6%. The interrupted time-series regression estimated an additional 6.4% (95% CI, 4.5 to 8.2%) increase in administrative expenses in 2020, relative to the pre-COVID annual increase of 3.9% (95% CI, 3.3 to 4.4%), while an additional increase in clinical expenses in 2020 (0.5%; 95% CI, –0.3 to 1.4%) did not differ from the pre-COVID annual increase of 3.7% (95% CI, 3.5 to 4%). Stratified analysis showed hospitals with larger utilization volume, located in states with lower COVID-19 burden, or situated in counties with higher median household income experienced larger increase in administrative expenses in 2020.

CONCLUSIONS: In 2020, administrative expenses grew much faster than clinical expenses, resulting in a larger share of hospital financial resources allocated to administrative activities. Higher administrative expenses might reflect hospitals' operational effort in response to the pandemic or inefficient cost management.

KEY WORDS: administrative expenses; hospital; COVID-19

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INTRODUCTION

During the early stage of the COVID-19 pandemic, U.S. hospitals faced declining patient revenue due to deferral or cancellation of non-urgent hospital visits and elective procedures.^{1,2} This revenue pressure forced the hospital industry to furlough and terminate at least 1.4 million health care workers to contain their clinical-related expenses.³ However, it remains unclear how hospitals responded to this external revenue shock by adjusting their administrative spending, a key policy and managerial issue. Administrative expenses account for more than a quarter of U.S. hospitals' spending, substantially higher than that of other industrialized countries.^{4–8} Concerns have been raised about the impact of high administrative expenses on the efficiency of hospital resource allocation.^{9,10} Evidence of how hospitals' administrative expenses changed during the COVID-19 pandemic is important for understanding hospitals' cost-containment approaches when facing operational shocks from a pandemic.

Using data from Medicare cost reports, this study examined changes in hospitals' administrative and clinical expenses in 2020, the first full year of the COVID-19 pandemic, relative to the pre-COVID period of 2016–2019. We focused on a cohort of 1420 general acute-care hospitals with fiscal years (FY) starting in January and continuously operating from 2016 to 2020. This sample selection approach enabled us to avoid inconsistently measuring COVID-19's financial impact across hospitals with different FY periods.¹¹

METHODS

Data and Sample

We used RAND Hospital Data (August 2022 version), which compiles Medicare cost reports from the Centers for Medicare and Medicaid Services (CMS).¹² The CMS Medicare cost reports, formally known as the hospital 2552–10 form under the Hospital Cost Report Information System (HCRIS), include information on hospital facility characteristics, service utilization, cost and charges, Medicare settlement data,

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and financial data, where all Medicare-certified hospitals in the U.S.A. are required to file their data every fiscal year.^{12,13} We examined Medicare-certified general acute-care hospitals with continuous operations during FY 2016–2020.¹¹ To address potential reporting anomalies, we excluded hospitals with the top 1% highest and lowest clinical expenses and administrative expenses per discharge equivalents, a standardized measure of hospital care utilization.^{14,15} Following prior literature, we focused on hospitals with FY starting in January (the most common FY starting month).¹¹

For each hospital, we obtained its clinical expenses and administrative expenses from Medicare cost reports worksheet A (key components summarized in Appendix Table 1).¹³ Consistent with prior literature, we aggregated clinical expenses from cost items in general-service cost centers (laundry and linen service, housekeeping, dietary, cafeteria, maintenance of personnel, pharmacy, social service, other general service, nonphysician anesthetists, intern and resident service-salary and fringes), inpatient routine service cost centers (all cost items except other special care), ancillary service cost centers (all cost items except PBP clinical laboratory services-program only, and ASC [non-distinct part], and allogeneic stem cell acquisition), outpatient service cost centers (all cost items), other reimbursable cost centers, and special-purpose cost centers (all cost items except interest expense, and utilization review-SNF).^{4,16}

We then summed up administrative expenses from cost items in general-service cost centers (administrative and general, employee benefits [salary only], nursing administration, central services and supply, medical records and medical records library) and in special-purpose cost centers (utilization review-SNF).⁴ Administrative and general cost is usually the single largest cost item in a hospital.⁶ It includes all costs incurred for administrative and general purposes but do not belong to any specific cost item, such as insurance billing, information technology, accounting and finance, and senior executive salary. Medicare cost reports do not have more granular information on the composition of the administrative and general cost.

We further calculated mixed expenses by summing up cost items from general-service cost centers (capital-related costs—buildings and fixtures, capital-related costs—movable equipment, employee benefits [non-salary only], maintenance and repairs, operation of plant), and from special-purpose cost centers (interest expense).⁴ The mixed expenses were then decomposed to clinical and administrative expenses by their relative weights.

Statistical Analysis

We first calculated our sample hospitals' median clinical expenses and median administrative expenses, and their interquartile range in 2016–2020. Then, we plotted the median and interquartile range of the annual percentage increase in clinical and administrative expenses over this period. Next, we ran

interrupted time-series regressions to estimate the impact of the COVID-19 pandemic on hospitals' annual clinical expenses and administrative expenses. Both outcomes were log-transformed due to the right-skewed distribution.¹⁷ In the model, we included a linear time trend over our study period (2016–2020). We included an indicator variable for 2020 to estimate the additional changes of clinical and administrative expenses during the first year of the COVID-19 pandemic, relative to the pre-COVID trend (2016–2019), as a step change, not a slope change. To control for variations in hospitals' scale of operations and time invariant hospital characteristics, we also included number of discharge equivalents (log transformed) and hospital fixed effects in the model. Discharge equivalent (DE) is a measure of combined inpatient and outpatient hospital service utilization, standardized into the unit of inpatient discharges.^{14,15} Standard errors were clustered at the hospital level. To further assess the specific driver for changes in administrative expenses, we decomposed this measure into administrative and general services (the largest individual line item, accounting for 75% of administrative expenses) and the rest as other administrative expenses. We then ran separate regression models on these two measures.

To assess if the impact of the COVID-19 pandemic on hospital expenses varied across hospital characteristics, we stratified the regression model by ownership type (for-profit, nonprofit, or government), geography (metropolitan, micropolitan, or rural), and size (large, medium, or small by discharge equivalent tertiles). Since the COVID-19 pandemic hit different areas with varying magnitude, we further stratified our model by state-level excess death per 100,000 attributed to COVID-19 (ranked in tertiles) as a proxy measure for COVID-19 disease burden in 2020.¹⁸ To further account for the economic burden associated with the pandemic in 2020, we stratified our model by county-level median household income of 2020 (ranked in tertiles) as a proxy for the local economic and labor market condition.¹⁹

As a sensitivity analysis, we re-ran the main model after replacing the log-transformed DE measure with log-transformed inpatient discharges. Moreover, we re-estimated our model on hospitals with the fiscal year beginning in July (the second-most common date), which included a total of 1128 hospitals from 5640 hospital-year observations (Appendix Table 8). These hospitals had COVID exposure in both FY 2019 (July 1, 2019, to June 30, 2020) and FY 2020 (July 1, 2020, to June 30, 2021).¹¹ STATA 14 was used for statistical analysis. The study did not fulfill criteria for human participant research, and institutional review board approval was not sought in accordance with 45 CFR §46.

RESULTS

Our study sample included 1420 hospitals (7100 hospital-year observations over 5 years) (Appendix Table 2). On average, these hospitals were more likely to be for-profit and located in metropolitan areas than hospitals with a non-January FY start (Appendix Table 3). As presented

in Figure 1, hospitals' median administrative and clinical expenses experienced continuous growth from \$27 (interquartile range [IQR], \$9 to \$68) million and \$73 (IQR, \$27 to \$178) million in 2016 to \$32 (IQR, \$11 to \$84) million and \$81 (IQR, \$30 to \$198) million in 2020, respectively. The median of both expenses had a similar annual rate of increase, around 4% from 2016 to 2019 (before COVID-19). However, the median administrative expenses increased by 6.2% (IQR, -1.2 to 15.1%) in 2020, while average clinical expenses grew by only 0.6% (IQR, -3.6 to 4.9%) (Fig. 2).

Figure 3 and Appendix Table 4 present the results from the interrupted time-series models. Before the COVID-19

pandemic (2016–2019), hospitals had an average annual increase of 3.9% (95% CI, 3.3 to 4.4%) and 3.7% (95% CI, 3.5 to 4%) for administrative and clinical expenses, respectively. In 2020, while the rate of increase for clinical expenses did not differ from the pre-COVID trend, administrative expenses increased 6.4% (95% CI, 4.5 to 8.2%) above the pre-COVID trend. Regression models on specific administrative expense subcategories showed that an increase in administrative and general cost item (accounting for 75% of overall administrative expenses) was the main driver of the increase (6.8% [95% CI, 4.7 to 8.9%]) (Fig. 3; Appendix Table 4).

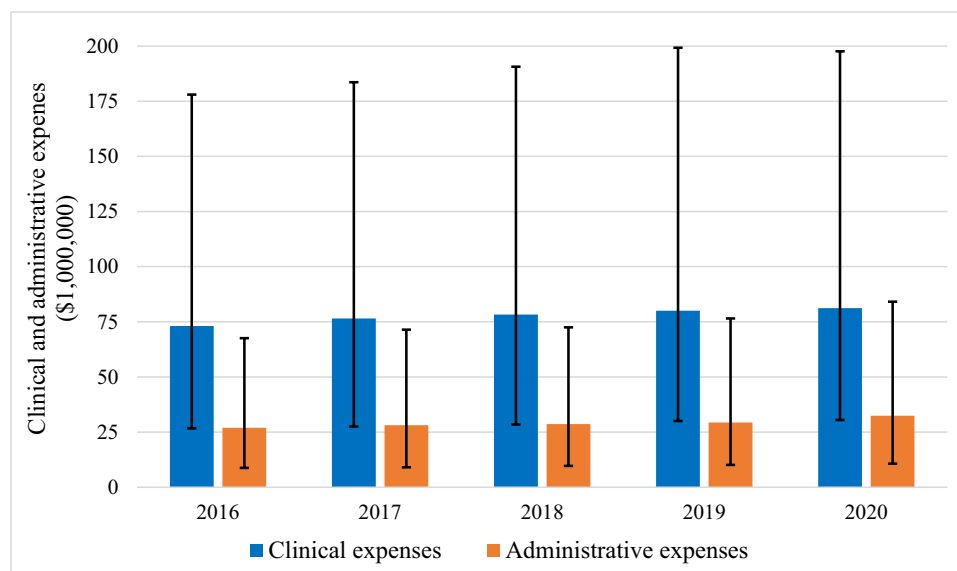


Figure 1 Median and interquartile range of clinical expenses and administrative expenses, 2016–2020. Interquartile ranges are marked as error bars. Expenses were not adjusted for inflation.

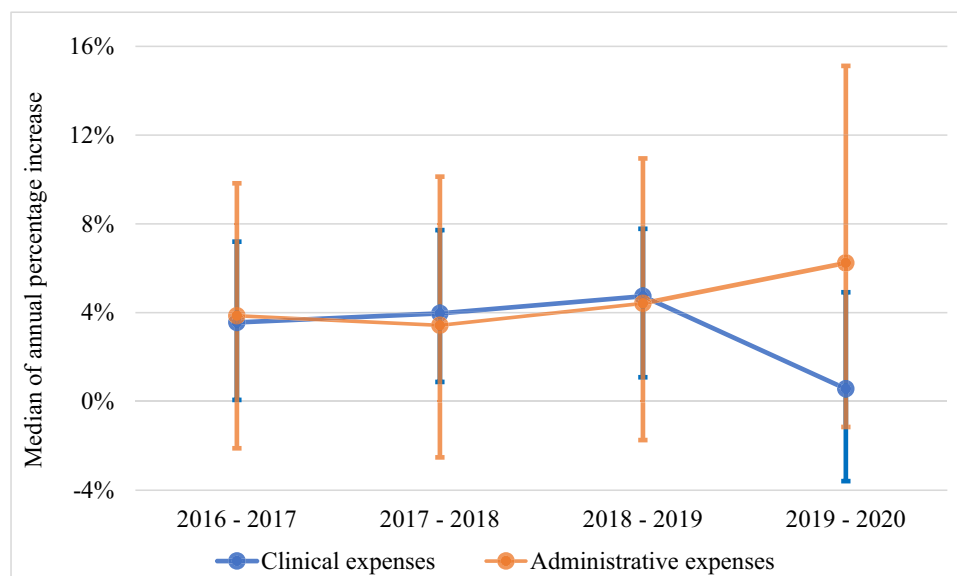


Figure 2 Median and interquartile range of the annual increase in clinical expenses and administrative expenses. Interquartile ranges are marked as error bars. Expenses were not adjusted for inflation.

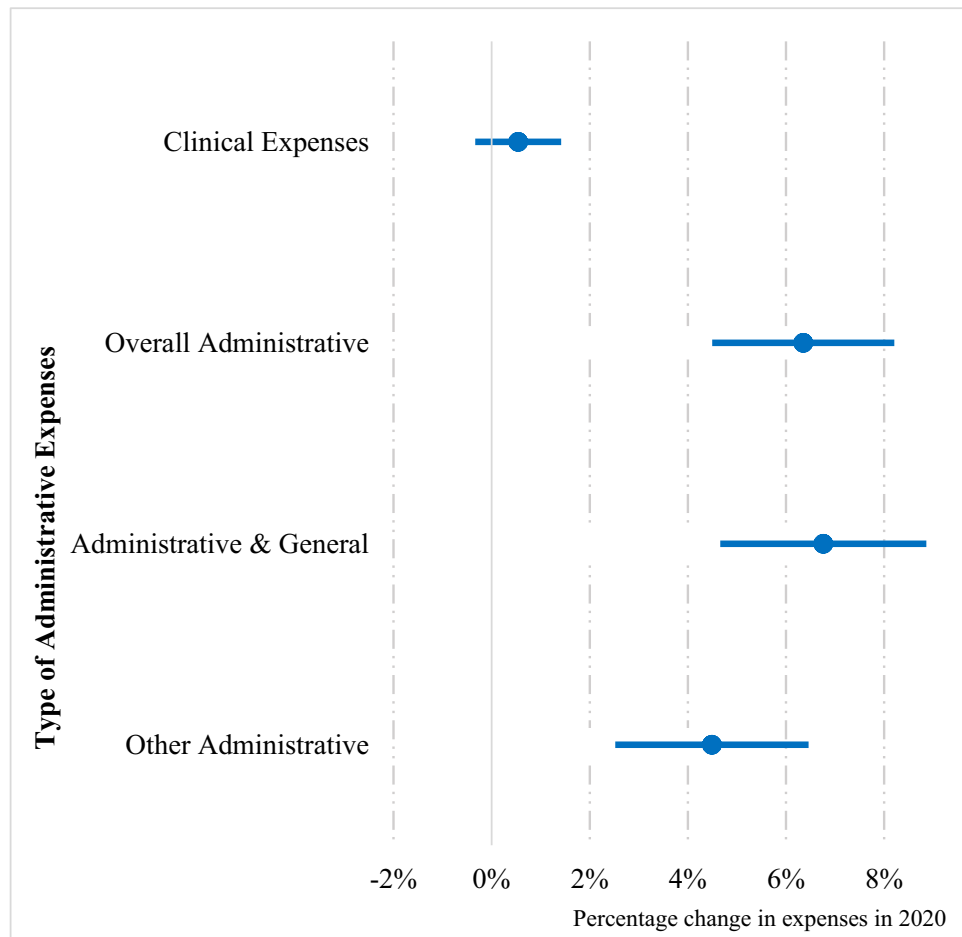


Figure 3 Impact of COVID-19 on hospitals' clinical and administrative expenses (and by type of administrative expenses) in 2020, relative to the pre-COVID annual trend. The dots represent the estimated impact of COVID-19 pandemic on the percentage change of clinical expenses or administrative expenses in 2020, relative to the pre-COVID annual trend. Ninety-five percent confidence intervals are marked. Expenses were not adjusted for inflation. Regression details are presented in Appendix Table 4.

The main results were robust to stratified analysis by hospital ownership, geographic status, utilization volume, COVID-19 burden, and income (Figs. 4 and 5; Appendix Tables 5 and 6). In particular, hospitals among the highest utilization tertile (measured by the number of discharge equivalents) had the largest increases (8.7% [95% CI, 4.4 to 13%]) in administrative expenses. Moreover, hospitals with a lower COVID-19 burden (measured by state-level excess death per 100,000 attributed to COVID-19 between March 1, 2020, and January 2, 2021, as a proxy) tertile experienced a smaller increase in clinical expenses but a larger increase in administrative expenses (lowest burden, -1% [95% CI, -2.6 to 0.7%] and 8.4% [95% CI, 4.6 to 12.2%]; medium burden, 0.4% [95% CI, -0.9 to 1.7%] and 5.7% [95% CI, 3 to 8.3%]; and highest burden, 2.6% [95% CI, 0.9 to 4.4%] and 5.3% [95% CI, 1.6 to 9%], respectively), following a dose-response pattern. Hospitals located in the wealthiest areas (measured by county-level median household income of 2020) had the smallest increase in clinical expenses (-1.2% [95% CI, -2.8 to

0.4%]) and the largest increase in administrative expenses (8.4% [95% CI, 4.6 to 12.2%]).

The results from the main model were robust to sensitivity analysis replacing the log-transformed DE measure with log-transformed inpatient discharges (Appendix Table 7). Similar to the main results, hospitals with FY starting in July experienced a 3.6% [95% CI, 3 to 4.2%] and 4% [95% CI, 3.7 to 4.3%] average annual increase for administrative expenses and clinical expenses before the pandemic, respectively. During the post pandemic period (FY 2019–2020), these hospitals had a 3.9% [95% CI, 2.3 to 5.5%] additional increase in administrative cost relative to the pre-COVID trend, higher than the 1% [95% CI, 0 to 1.8%] additional increase for clinical expenses (Appendix Table 8).

DISCUSSION

U.S. hospitals' clinical and administrative spending had increased at similar paces during 2016–2019. In 2020, the first year of the COVID-19 pandemic, administrative

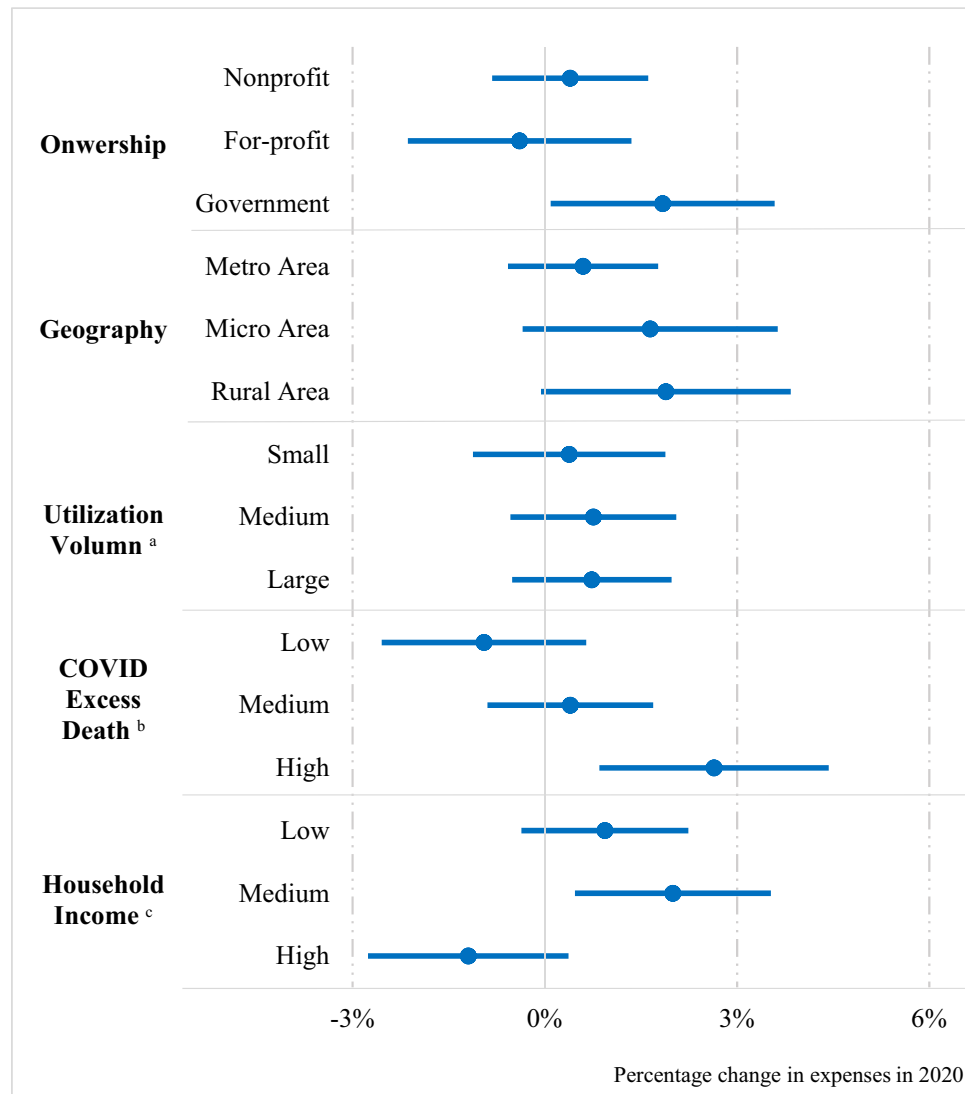


Figure 4 Impact of COVID-19 on hospitals' clinical expenses in 2020, relative to the pre-COVID annual trend, stratified by hospital ownership, geography, utilization volume, COVID-19 excess death, and median household income. The dots represent the estimated impact of the COVID-19 pandemic on the percentage change of clinical expenses in 2020, relative to the pre-COVID annual trend.

^aHospitals were grouped based on the number of discharge equivalents tertile. ^bHospitals were grouped based on state-level excess death per 100,000 attributed to the COVID-19 tertile, which was measured between March 1, 2020, and January 2, 2021. The state of North Carolina was excluded due to delays in reporting. ^cHospitals were grouped based on the county-level median household income of the 2020 tertile. Ninety-five percent confidence intervals are marked. Regression details are presented in Appendix Table 5.

expenses grew much faster than clinical expenses, resulting in a larger share of hospital financial resources allocated to administrative activities. Higher administrative expenses incurred during 2020 might reflect hospitals' operational effort in response to the pandemic, for example, relief funding application, data collection, organizing field hospitals, outfitting hospitals to provide telehealth and other care coordination in the surrounding communities, and local COVID-19 task forces. Our study contributes to prior literature on hospital administrative expenses by documenting U.S. hospitals' spending on administrative activities in response to the COVID-19 pandemic.⁴⁻¹⁰

This spending pattern was consistent across hospitals of different ownership types, in different geographic locations, and with different degrees of care utilization. In particular, larger hospitals had the highest percentage increase in administrative expenses in the first year of the pandemic. We also found that hospitals with lower COVID-19 burden experienced a smaller increase in clinical expenses but a larger increase in administrative expenses, which suggests potential interactions between these expense categories. It is worth emphasizing that the results of our study should not be used as evidence for causal relationships. Whether increased administrative spending improves hospitals'

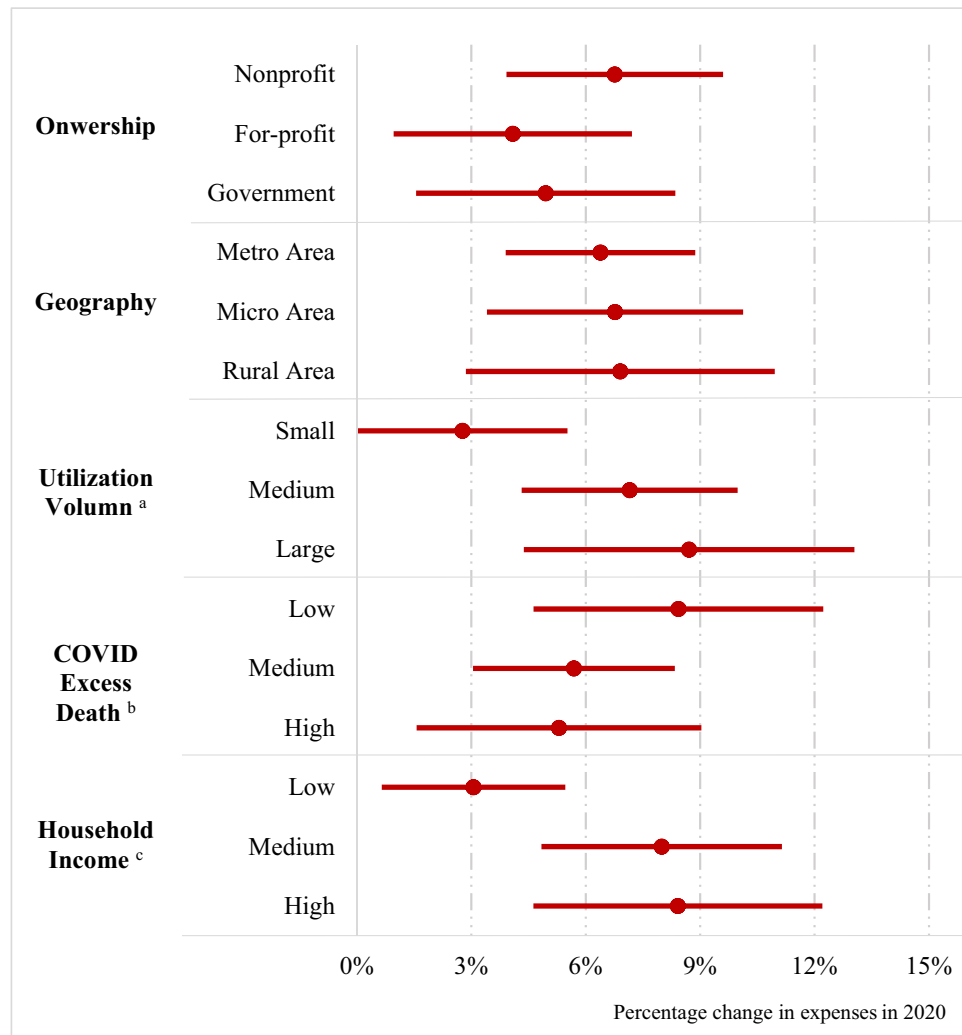


Figure 5 Impact of COVID-19 on hospitals' administrative expenses in 2020, relative to the pre-COVID annual trend, stratified by hospital ownership, geography, utilization volume, COVID-19 excess death, and median household income. The dots represent the estimated impact of the COVID-19 pandemic on the percentage change of administrative expenses in 2020, relative to the pre-COVID annual trend. ^aHospitals were grouped based on the number of discharge equivalents tertile. ^bHospitals were grouped based on state-level excess death per 100,000 attributed to the COVID-19 tertile, which was measured between March 1, 2020, and January 2, 2021. The state of North Carolina was excluded due to delays in reporting. ^cHospitals were grouped based on county-level median household income of the 2020 tertile. Ninety-five percent confidence intervals are marked. Expenses were not adjusted for inflation. Regression details are presented in Appendix Table 6.

pandemic preparedness and whether it negatively affected clinical spending or vice versa are important questions for future research investigation. Among clinical expenses, certain components naturally decrease when service volume drops, such as contracted labor and medical supply. In contrast, administrative expenses appeared to be less responsive to service volume change. For example, the salary of administrative personnel and legal insurance spending are constant unless layoffs or termination of agreements occurs. This distinction between clinical and administrative expenses may partially explain their different patterns during the pandemic. Administrative expenses incurred in response to the pandemic might be less persistent than other types of administrative expenses. To investigate this hypothesis is a promising future research topic.

This study had several important limitations. First, hospital cost reports were based on hospitals' administrative records, which may contain potential reporting inaccuracies. Second, using hospitals with January or July FY periods, our results may not be extrapolated to hospitals with other FY periods.¹¹ Due to data availability, our estimates of COVID-19 impact were limited to 2020, the first year of the pandemic. Future research using data beyond 2020 would be helpful to understand the long-term impact of COVID-19 on hospital expenses. Third, due to data unavailability, we were unable to further break down administrative and clinical expenses into more granular categories (e.g., insurance billing rate cost, senior executive salary) and thus could not identify specific drivers for the growing administrative expenses. Fourth, the associations documented in this study

do not suggest causality. Finally, understanding the variation in spending patterns across hospitals with different financial and operational characteristics was beyond the scope of this study, which was narrowly confined to the general time trend of hospitals' expenses.

In light of these limitations, the results of this study have important implications for researchers and policymakers interested in understanding hospitals' cost-management behaviors under operational shocks during a pandemic. Prior research found that, due to generous COVID-19 relief funds from the federal government, most hospitals' financial viability either remained unchanged or improved during the pandemic.¹¹ Taxpayers, who ultimately pay for government relief funds, have incentives to ensure that hospitals engaged in activities aligned with the purpose of the relief. However, the current reporting requirement is unable to shed sufficient light—for example, administrative and general expenses are reported as one aggregated number. It is worth noting that all U.S. publicly traded companies are required to disclose compensation paid to high-ranking executive officers. Policymakers may consider a similar approach for hospitals through Medicare cost reports. This approach would add limited compliance burden but provide more transparency on administrative expenses so as to improve oversight from stakeholders and the public.

CONCLUSION

In 2020, the first year of the COVID-19 pandemic, U.S. hospitals' administrative expenses grew substantially faster than clinical expenses, resulting in a larger share of hospital financial resources allocated to administrative activities. Higher administrative expenses might reflect hospitals' operational effort in response to the pandemic or inefficient cost management. Policymakers should consider improving transparency on hospital administrative expenses.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s11606-023-08158-8>.

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Data Availability The dataset analyzed during the current study is available in the RAND Hospital Data, <https://www.hospitaldatasets.org/>.

Declarations

Conflict of Interest The authors declare that they do not have a conflict of interest.

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