



# State-Level Hospital Quality in the United States: Analyzing Variation and Trends From 2013 to 2021

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## ABSTRACT

**Objective:** This study develops a hospital quality index to analyze state-level variations in hospital quality in the United States from 2013 to 2021, using data from 3,000 hospitals from the Centers for Medicare & Medicaid Services (CMS) Hospital Compare data set.

**Design:** The quality index combines three risk-adjusted measures from the CMS Hospital Compare: 30-day readmission rate, 30-day mortality rate, and patient experience. Each measure is converted into a z-score, weighted by hospital beds, and averaged to form the final index, which has a mean of 0 and a standard deviation of 1.

**Results:** In 2021, the average U.S. hospital quality measures were 15.1% for readmissions, 11.2% for mortality, and 69.7% for patient experience. There was significant state-level heterogeneity. The quality index ranged from  $-0.54$  to  $0.57$ . Eight states notably outperformed the U.S. average, with Utah leading. Conversely, 14 states underperformed. From 2013 to 2021, there was an average annual improvement in readmissions (0.08pp) and mortality (0.12pp), but a decline in patient experience (0.27pp).

**Conclusions:** The study highlights improvements in hospital quality over time but underscores disparities at the state level. The quality index provides a valuable tool for understanding and addressing these variations in hospital care quality.

**Keywords:** hospital quality, healthcare outcomes, quality index, 50-state trend analysis

## Introduction

When the Institute of Medicine report on hospital quality and patient safety was published in 2000,<sup>1</sup> it served as a wake-up call of the importance of measuring and improving quality of care in hospitals. Since that time, the Centers for Medicare & Medicaid Services (CMS) established Hospital Compare, a repository of quality measures at the hospital level. In this study, we aggregate those hospital-level measures to the state level to analyze hospital quality levels and trends to better understand state-level hospital quality heterogeneity. This study complements other state-level and metropolitan-statistical-area-level studies that analyzed healthcare expenditures,<sup>2-4</sup> hospital prices,<sup>5,6</sup> and hospital market concentration.<sup>5</sup> Analyzing variations in hospital quality across states can reveal disparities in healthcare access, resources,

spending,<sup>7</sup> and outcomes,<sup>8</sup> which is essential for addressing healthcare inequities and ensuring that all states have access to high-quality care.

The primary goal of our research is to analyze and assess the quality of care in hospitals across all 50 states and Washington DC. Previous studies have examined various aspects of hospital quality, often focusing on metrics such as 30-day readmission rates, 30-day mortality rates, and patient experience in the context of specific population groups or localities. For example, one study investigated the link between hospital discharge prices and clinical quality,<sup>9</sup> while others have explored factors influencing 30-day readmission rates in patients with myocardial infarction, particularly among high-risk populations.<sup>10-12</sup> Additional studies examined the relationships between mortality rates and other healthcare outcomes, emphasizing the complexity of these interactions and the need for comprehensive interventions.<sup>13,14</sup> Furthermore, some research demonstrated the significant impact of patient experience on clinical outcomes, suggesting the importance of incorporating patient perceptions in quality assessments.<sup>15-17</sup> Thus, prior research has mostly focused on quality of care using readmissions, mortality, and patient experience locally within the United States without specifically addressing the

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comparison across all 50 states and Washington DC. Our study extends previous research by empirically examining the quality of care across each state in the United States from 2013 to 2021 by using hospital-level data from CMS Hospital Compare, leading to four major contributions. First, we create a composite quality index using three hospital quality measures: 30-day readmission rate, 30-day mortality rate, and patient experience. Second, we estimate this measure for each state from 2013 to 2021. Third, using regression analysis, we compare the quality index in each state with the national average in 2021. Fourth, we analyze the changes in the quality index for each state between 2013 and 2021.

This research offers valuable insights to policy-makers, healthcare administrators, and stakeholders regarding the progress made in different states during the study period, highlighting areas of excellence and potential disparities. Gaining a comprehensive understanding of state-level quality trends and their comparisons with the national average contributes to the ongoing efforts aimed at achieving equitable and high-quality healthcare.

## Methods

The hospital quality data are from Hospital Compare provided by the Centers for Medicare & Medicaid Services (CMS) from 2013 to 2021. This study was waived from IRB approval of our institution because it uses publicly available data on hospitals from CMS. Specifically, we analyzed 30-day readmission rates, 30-day mortality rates, and patient experience because these measures were risk adjusted by CMS,<sup>18</sup> available during the entire sample period, and used previously.<sup>19</sup> In 2021, Hospital Compare contained 3,128 acute care general hospitals, 3,022 (96.6%) had data on readmission rate, 2,711 (86.7%) had data on mortality, and 3,011 (96.3%) had data on patient experience. For the other years of data, the number of hospitals and missing rates varied slightly, but were consistent with those of 2021. For more details on the number of hospitals included by measure, see Table A1.

## Study Measures

### 30-Day Readmission Rate

The 30-day readmission rate measures the percentage of patients who return to the hospital within 30 days of their discharge, regardless of whether it is the same hospital or a different hospital. This measure encompasses various types of care, such as medical, surgical, gynecologic,

neurologic, cardiovascular, and cardiorespiratory care, provided from 2013 to 2021. A higher readmission rate suggests lower hospital quality, indicating potential complications or issues with care transitions.

### 30-Day Mortality

The 30-day mortality rate measures the percentage of patients who die within 30 days of hospital admission for specific conditions. These data, consistently reported from 2013 to 2021, cover six conditions: heart attack (AMI), coronary artery bypass graft surgery, chronic obstructive pulmonary disease, heart failure, stroke (STK), and pneumonia (PN). Elevated mortality rates indicate possible problems with patient care during and/or after hospital admission, signaling lower hospital quality.

### Patient Experience

Patient experience data are collected through the CMS Hospital Consumer Assessment of Health Care Providers and Systems (HCAHPS) survey. This survey gathers feedback from randomly selected adult patients discharged within 48 hours to 6 weeks. It assesses aspects such as nurse and doctor communication, staff responsiveness, discharge information, and overall patient hospital rating. Scores range from 0 to 100, with higher values indicating better patient experiences and higher hospital quality.

### Quality Index

This index creates a composite of the three quality measures using z-scores for each, ensuring a mean of 0 and a standard deviation of 1. Z-scores help standardize each measure and then create a composite using three measures of hospital quality. This follows from a recent study that used z-scores to create composite measures for hospital processes and patient experience.<sup>10</sup> It is calculated using data from 2013 to 2021, with the mean subtracted, and the result divided by the standard deviation for each year. For readmission and mortality measures, z-scores are multiplied by -1 to ensure higher values represent better quality. State-year-level quality indexes are then created by averaging z-scores for readmission, mortality, and patient experience measures, allowing an assessment of performance changes over time and across the states.

### Statistical Analyses

To compare each state's 2021 quality index with the U.S. average, we estimated Equation 1, in which  $i$  indexes hospitals,  $s$  indexes states, subject to the constraint that the state parameter estimates sum to 0.

The dependent variable ( $Q$ ) is the quality index for the state in 2021;  $S$  is a vector of 0–1 binary variables, one of each state and Washington DC; and  $u$  is the error term. To estimate a traditional regression model that includes binary variables for each state, one state must be omitted, known as the reference state, and all other states are compared with it. However, we wanted to compare each state with the U.S. average, which is statistically possible by adding the constraint, as described by Daniel Suits.<sup>20</sup> This constraint makes sure that the average of all state comparisons equals the national average. We think of it like comparing each state’s hospital performance with an overall score for the entire country. This way, we can see how much better or worse each state’s hospital quality is compared with the overall U.S. standard. The parameters of interest are in vector  $b$ , which contains one parameter estimate for each state and Washington DC. The parameter estimates compare the state’s quality index with the U.S. average in standard deviation units because the quality index was constructed as z-score with mean of 0 and a standard deviation equal to 1.

$$Q_{is} = a_0 + \sum_{s=1}^{51} b_s S_s + u_{is}, \quad (1)$$

subject to the constraint that  $\sum_{s=1}^{51} (b_s)^* = \sum_{s=1}^{51} (b_s + K) = 0$ , whereby  $b_s^*$  is a linear combination of  $b_s$  and a constant  $K$ .

## Results

Figure 1 plots the national trends in readmission rate, mortality rate, and patient experience from 2013 to 2021. The 30-day readmission rate decreased from 15.8% to 15.1%, showing an average annual improvement of 0.08 percentage points. Similarly, the 30-day mortality rate decreased from 12.3% to 11.2%, with an average annual improvement of 0.12 percentage points. In contrast, patient experience worsened, declining from 72.1 to 69.7, averaging a decrease of 0.27 percentage points annually (See Appendix Table 1, Supplemental Digital Content 1, <http://links.lww.com/JHQ/A233>, for values).

At the state level, states were categorized into three groups based on whether their 2021 quality index significantly deviated from the U.S. average. Figure 2 shows that eight states performed significantly better than the national average, with Utah leading at 0.56 standard deviations above the U.S. average, followed by Hawaii (0.47), South Dakota (0.44), Oregon (0.42), and others. Conversely, 14 states performed significantly worse than the U.S. average, with Nevada (−0.51), West Virginia (−0.45), Florida (−0.44), and

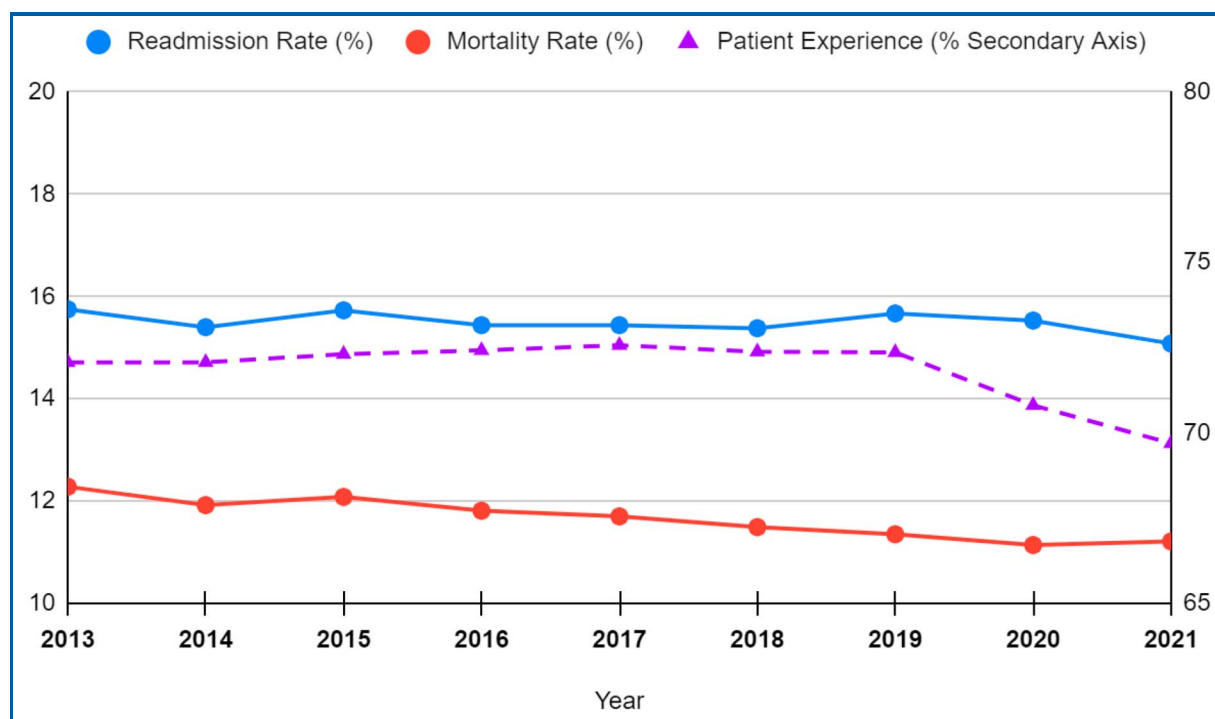
Arkansas (−0.38) performing the worst (See Appendix Table 2, Supplemental Digital Content 1, <http://links.lww.com/JHQ/A233>, for values).

Figure 3 compares the change in quality index across states from 2013 to 2021 in a scatterplot. In total, 24 states showed an increase in their quality index between 2013 and 2021 (as evidenced by being above zero on the x-axis), with Washington DC, Alaska, North Dakota, and Wyoming showing the biggest improvement. Notably, New Hampshire, Vermont, South Carolina, Massachusetts, Arizona, Missouri, and Georgia experienced the largest decreases in their quality index. Among states with a higher quality index score in 2021 compared with that in 2013, Washington DC exhibited the highest increase at 0.57 points, indicating significant enhancements in patient outcomes, encompassing readmission, mortality, and patient experience.

These findings provide valuable data for assessing and comparing healthcare quality across states, and over time, aiding policymakers and stakeholders in their efforts to enhance healthcare outcomes and patient experiences.

## Limitations

Our study’s results should be interpreted in the context of the following limitations. The three quality measures we examined—hospital readmissions, mortality, and patient experience—are important and are widely used hospital quality measures. Nonetheless, other measures of quality are important as well, such as process measures, which the hospital has more control over as compared with outcome measures, which are influenced by patient behaviors. However, the hospital process measures in CMS Hospital Compare were only available until 2014, so we did not include them in this analysis because they did not cover our full study period from 2013 to 2021. Second, although two of the three quality measures (hospital readmissions and mortality) improved over time, more work needs to be done to align these measures and the strategies used to improve them across the healthcare system. The fragmented nature of the U.S. healthcare system, with its many independent entities, makes it difficult to implement consistent quality improvement strategies nationwide.<sup>21</sup> In addition, there is a need for a better understanding of which strategies work best in different healthcare settings and contexts, because what is effective in one situation may not be in another.<sup>22</sup> Third, the COVID-19 pandemic introduced major shifts in patient population demographics, healthcare delivery, treatment approaches, and the prevalence of different diseases,



**Figure 1.** Quality measures for the United States, 2013–2021. Source: Authors' analysis of CMS Hospital Compare.

which likely affected hospital quality metrics. Although recent research has analyzed the financial affects of the pandemic on U.S. hospitals,<sup>23</sup> they do not address the quality of care, highlighting a critical area for future research. Future studies should incorporate these factors to provide a more comprehensive analysis of hospital quality during and postpandemic. Despite its limitations, our study highlights the need for continued efforts to refine and expand quality measurement frameworks to include a broader array of metrics and to adapt to the evolving healthcare landscape.

## Discussion

This study constructed a hospital quality index to estimate the overall performance of hospitals in all 50 states and Washington DC. Based on CMS Hospital Compare data, we identified states that performed well in 2021 and those that performed poorly, compared with the U.S. average. There was substantial heterogeneity observed in quality across states. Utah, Oregon, and Hawaii demonstrated high performance, while Nevada, West Virginia, and Florida were among the lowest performers.

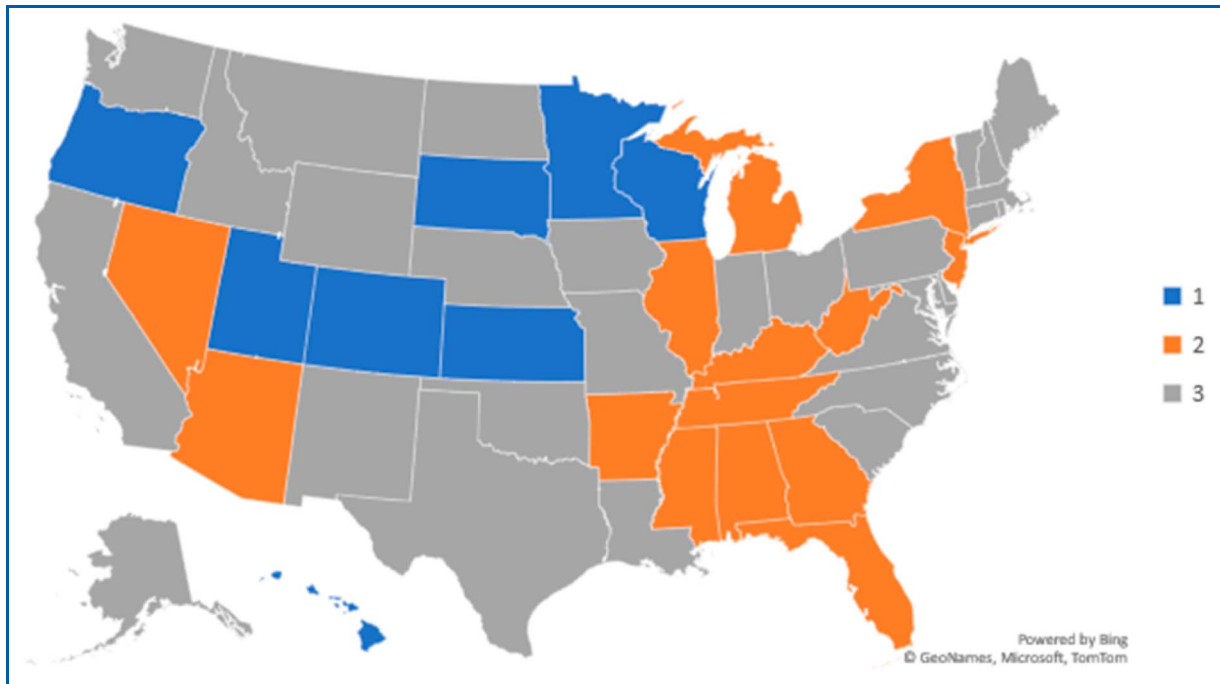
The trends identified in this study align with nationwide hospital rankings published by other organizations, such as U.S. News & World Report and the Leapfrog Group, which also highlight significant

interstate variations in hospital quality.<sup>24,25</sup> Our findings corroborate these rankings by showing consistent high performance in states such as Utah, known for their robust healthcare systems and policies, and persistent challenges in states with historically lower healthcare performance.

Our analysis underscores the critical need for targeted strategies to address the disparities in healthcare quality. States such as Florida and Nevada could benefit from adopting best practices from higher performing states. This includes investing in healthcare infrastructure, improving care coordination, and implementing patient-centered care models.

## Conclusions

In this study, we observed a modest yet statistically significant improvement in the national healthcare quality, characterized by reductions in 30-day readmission and mortality rates from 2013 to 2021. However, these improvements were juxtaposed against a decline in patient experience scores, underscoring a complex landscape of healthcare quality advancement in the United States. The development and application of a hospital quality index allowed for a nuanced assessment of state-level performance, revealing a spectrum of healthcare quality across the states. States such as Utah and Oregon were identified



**Figure 2.** Map of Quality Index by state, 2021. \*Washington DC is included in the count of 29 states. High quality (1 = blue) means the state’s quality index was statistically higher than the U.S. average ( $p \leq .05$ ), and low quality (2 = orange) means the state’s quality index was statistically lower than the U.S. average ( $p < .05$ ). Average quality (3 = gray) means the state’s quality index was not statistically different from the U.S. average at the 0.05 level. Source: Authors’ analysis of CMS Hospital Compare.

as high performers, setting benchmarks for quality care, while others including Florida and Nevada were highlighted as states needing targeted improvement efforts. This bifurcation underscores the heterogeneity in healthcare quality and the imperative for tailored strategies to uplift underperforming areas.

The findings of this study offer valuable insights for policymakers, healthcare administrators, and stakeholders, emphasizing the need for a concerted focus on enhancing patient outcomes and experiences across the board. By identifying specific regions that require intervention and those that exemplify healthcare excellence, our research provides a roadmap for targeted policy and practice reforms. It highlights the potential for significant improvements in healthcare delivery and patient satisfaction through strategic investments and initiatives. Given that the recent COVID-19 pandemic has exacerbated healthcare disparities,<sup>26,27</sup> received varying responses from the states,<sup>28,29</sup> and significantly affected healthcare delivery,<sup>30-32</sup> the insights derived from this research are critical for informing efforts to achieve a more equitable, effective, and patient-centered quality of care in the healthcare system.

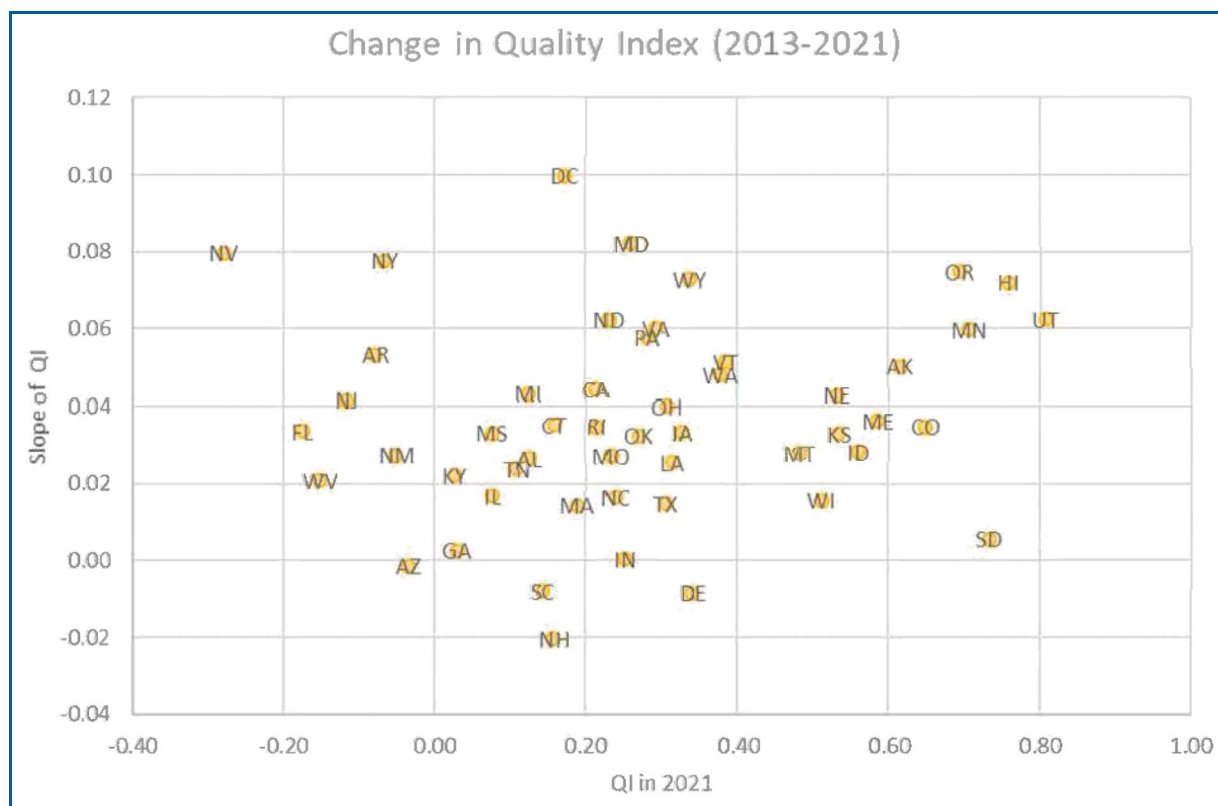
## Implications

The implications of this study are substantial for policymakers, healthcare administrators, and stakeholders.

For policymakers, the findings emphasize the importance of targeted interventions in underperforming states. Strategies may include increasing funding for healthcare facilities, enhancing training programs for healthcare professionals, and promoting policies that incentivize high-quality care. In addition, sharing best practices and successful care models from high-performing states can help elevate the overall standard of care.

Healthcare administrators can leverage these insights to benchmark their performance against state and national averages. This benchmarking can guide quality improvement initiatives, focusing on areas such as reducing readmission and mortality rates and enhancing patient experiences. Furthermore, administrators in lower performing states can collaborate with counterparts in higher performing regions to adopt effective strategies and interventions.

For stakeholders, including patients and advocacy groups, this study highlights the importance of informed decision making when seeking care. Understanding



**Figure 3.** Scatterplot of change in Quality Index from 2013 to 2021 versus Quality Index in 2021 by State. Source: Authors' analysis of CMS Hospital Compare.

state-level variations in hospital quality can empower patients to make better healthcare choices and advocate for improvements in their local healthcare systems.

Overall, the study underscores the necessity of a concerted effort to address healthcare disparities across the United States, providing actionable insights that can drive policy and practice reforms aimed at achieving a more patient-centered and effective healthcare system.

## Authors' Biographies

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## References

1. Institute of Medicine. *To Err Is Human: Building a Safer Health System*. The National Academies Press; 2000. <https://nap.nationalacademies.org/download/9728> Accessed July 5, 2023.
2. Johnson EK, Wojtesta MA, Crosby SW, et al. Varied health spending growth across US states was associated with incomes, price levels, and medicaid expansion, 2000-19: Study examines factors associated with health spending growth across the US. *Health Aff (Millwood)* 2022;41(8):1088-1097.
3. CMS Office of the Actuary. *Health Expenditures by State of Residence, 1991-2020 (Data)*. Centers for Medicare & Medicaid Services; 2022. <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsStateHealthAccountsResidence>. Accessed August 15, 2022.

4. Lassman D, Sisko AM, Catlin A, et al. Health spending by state 1991-2014: Measuring per capita spending by payers and programs. *Health Aff (Millwood)* 2017;36(7):1318-1327.
5. Health Care Cost Institute. *Healthy Marketplace Index: 2017 to 2021*. Health Care Cost Institute; 2023. <https://healthcostinstitute.org/hcci-originals/healthy-marketplace-index/hmi>. Accessed July 23, 2023.
6. Chernew ME, Hicks AL, Shah SA. Wide State-Level Variation in Commercial Health Care Prices Suggests Uneven Impact of Price Regulation: An examination of state-level price variation in the commercial market, relative to Medicare, for a broader set of states and a wider set of services than had been previously examined. *Health Aff (Millwood)* 2020;39(5):791-799.
7. Herring B, Trish E. Explaining the growth in US health care spending using state-level variation in income, insurance, and provider market dynamics. *Inq a J Med Care Organ Prov Financ*. 2015;52:0046958015618971.
8. Bradley EH, Canavan M, Rogan E, et al. Variation in health outcomes: The role of spending on social services, public health, and health care, 2000-09. *Health Aff (Millwood)* 2016;35(5):760-768.
9. Crespín DJ, Whaley C. The effect of hospital discharge price increases on publicly reported measures of quality. *Health Serv Res*. 2023;58(1):91-100.
10. Pandey A, Golwala H, Hall HM, et al. Association of US Centers for Medicare and Medicaid services hospital 30-day risk-standardized readmission metric with care quality and outcomes after acute myocardial infarction: Findings from the national cardiovascular data registry/acute coronary treatment and intervention outcomes network registry—get with the guidelines. *JAMA Cardiol*. 2017;2(7):723-731.
11. Amritphale A, Fonarow GC, Amritphale N, Omar B, Crook ED. All-cause unplanned readmissions in the United States: Insights from the nationwide readmission database. *Intern Med J*. 2023;53(2):262-270.
12. Chopra I, Wilkins TL, Sambamoorthi U. Hospital length of stay and all-cause 30-day readmissions among high-risk Medicaid beneficiaries. *J Hosp Med*. 2016;11(4):283-288.
13. Pandey A, Keshvani N, Khera R, et al. Temporal trends in racial differences in 30-day readmission and mortality rates after acute myocardial infarction among Medicare beneficiaries. *JAMA Cardiol*. 2020;5(2):136-145.
14. Parizo JT, Kohsaka S, Sandhu AT, Patel J, Heidenreich PA. Trends in readmission and mortality rates following heart failure hospitalization in the veterans affairs health care system from 2007 to 2017. *JAMA Cardiol*. 2020;5(9):1042-1047.
15. Trzeciak S, Gaughan JP, Bosire J, Mazzarelli AJ. Association between Medicare summary star ratings for patient experience and clinical outcomes in US hospitals. *J Patient Exp* 2016;3(1):6-9.
16. Navarro S, Ochoa CY, Chan E, Du S, Farias A. Will improvements in patient experience with care impact clinical and quality of care outcomes?: A systematic review. *Med Care* 2021;59(9):843-856.
17. Takeshita J, Wang S, Loren AW, et al. Association of racial/ethnic and gender concordance between patients and physicians with patient experience ratings. *JAMA Netw Open* 2020;3(11):e2024583.
18. CMS. Linking quality to payment. <https://data.cms.gov/provider-data/topics/hospitals/linking-quality-to-payment> Accessed October 11, 2022
19. Beaulieu ND, Dafny LS, Landon BE, Dalton JB, Kuye I, McWilliams JM. Changes in quality of care after hospital mergers and acquisitions. *N Engl J Med*. 2020;382(1):51-59.
20. Suits DB. Dummy variables: Mechanics v. Interpretation. *Rev Econ Stat*. 1984;66(1):177-180.
21. Burstin H, Leatherman S, Goldmann D. The evolution of healthcare quality measurement in the United States. *J Intern Med*. 2016;279(2):154-159.
22. Kringos DS, Sunol R, Wagner C, et al. The influence of context on the effectiveness of hospital quality improvement strategies: A review of systematic reviews. *BMC Health Serv Res*. 2015;15(1):277-313.
23. Li K, Al-Amin M, Rosko MD. Early financial impact of the COVID-19 pandemic on US Hospitals. *J Healthc Manag/Am Coll Healthc Executives* 2023;68(4):268-283.
24. Source "U.S. News & World Report's Best Hospitals". "Copyright © 2023 U.S. News & World Report."
25. Source "The Leapfrog Group Health Care Ratings and Report". *Hospital ratings and reports | Leapfrog (leapfroggroup.org)*.
26. Okonkwo NE, Aguwa UT, Jang M, et al. COVID-19 and the US response: accelerating health inequities. *BMJ Evidence-Based Medicine*. 2021;26:176-179.
27. Andraska EA, Alabi O, Dorsey C, et al. Health care disparities during the COVID-19 pandemic. *Semin Vasc Surg*. 2021;34(3):82-88.
28. Crow DA, DeLeo RA, Albright EA, et al. Policy learning and change during crisis: COVID-19 policy responses across six states. *Rev Pol Res*. 2023;40(1):10-35.
29. Kerpen P, Moore S, Mulligan CB. A final report card on the states' response to COVID-19<sup>1</sup>. *Int J Econ Business* 2023;30(2):139-158.
30. Auty SG, Aswani MS, Wahbi RN, Griffith KN. Changes in health care access by Race, Income, and Medicaid Expansion during the COVID-19 pandemic. *Med Care* 2023;61(1):45-49.
31. Huggins A, Husaini M, Wang F, et al. Care disruption during COVID-19: A national survey of hospital leaders. *J Gen Intern Med*. 2023;38(5):1232-1238.
32. Williams R, Srinivasan A, Periasamy M. Exploring the impact of COVID-19 on the healthcare system and vulnerable populations in the United States. *Int J Med Students* 2024;12(2):185-194.



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**Core CPHQ Examination Content Area  
Domain—Health Data Analytics**

## CE Objectives and Posttest Questions: State-Level Hospital Quality in the United States: Analyzing Variation and Trends From 2013 to 2021

### Learning objectives:

1. **Describe** the methodology used to create the hospital quality index and its significance in assessing state-level hospital quality.
2. **Identify** key trends in hospital readmission, mortality, and patient experience rates from 2013 to 2021.
3. **Describe** state-level variations in hospital quality and identify the implications for healthcare policy and administration.

### Questions

1. **What is the primary purpose of the hospital quality index developed in this study?**
  - a. To rank hospitals based on profit margins.
  - b. To analyze state-level variations in hospital quality.
  - c. To measure patient satisfaction only.
  - d. To compare insurance coverage across states.
2. **Which measure was included in the hospital quality index?**
  - a. Length of hospital stay.
  - b. Patient mortality.
  - c. Staff-to-patient ratio.
  - d. Healthcare spending per capita.
3. **What was the national trend in 30-day readmission rates from 2013 to 2021?**
  - a. It increased annually by 0.27%.
  - b. It remained constant.
  - c. It decreased annually by 0.08%.
  - d. It increased annually by 0.12%.
4. **Which data source did the study use?**
  - a. American Hospital Association (AHA) Annual Survey.
  - b. CMS Hospital Compare.
  - c. National Healthcare Quality and Disparities Report.
  - d. Healthcare Cost and Utilization Project (HCUP).
5. **Which of the following states outperformed the U.S. average in hospital quality in 2021?**
  - a. Nevada
  - b. West Virginia
  - c. Utah
  - d. Florida
6. **What was the national trend in 30-day readmission rates from 2013 to 2021?**
  - a. It increased annually by 0.27%.
  - b. It remained constant.
  - c. It decreased annually by 0.08%.
  - d. It increased annually by 0.12%.
7. **What was the main finding regarding patient experience from 2013 to 2021?**
  - a. Patient experience scores improved.
  - b. Patient experience scores remained stable.
  - c. Patient experience scores had an average annual decline.
  - d. Patient experience scores are not included in the study.
8. **What recommendation does the study make for policymakers?**
  - a. Standardize hospital staffing levels.
  - b. Share best practices from high-performing states.
  - c. Increase patient satisfaction bonuses.
  - d. Reduce healthcare costs uniformly.
9. **Which of the following is NOT a component of the hospital quality index?**
  - a. 30-day readmission rate.
  - b. Patient satisfaction score.
  - c. 30-day mortality rate.
  - d. Hospital bed utilization rate.
10. **Which of the following states saw the largest improvement in hospital quality index from 2013 to 2021?**
  - a. Florida
  - b. Wyoming
  - c. West Virginia
  - d. Vermont