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Over- and underreporting of prices: most hospitals are not compliant with the Hospital Price Transparency Rule

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Abstract

Concern has been raised about the effectiveness of the Hospital Price Transparency Rule to facilitate a clear understanding of health care prices due to poor reporting by hospitals. However, the relationship between what services the hospital provides and what prices they report is not clear. We assessed reported prices in the Turquoise Health database and compared them at the hospital level with the CMS Provider of Services File to identify if a shoppable service was provided at a hospital. We found significant mismatch between the hospital prices being reported and the services being provided. For example, 56% of hospitals providing at least 1 shoppable service that requires public price reporting did not report any prices. Of hospitals reporting prices, most hospitals (66%) reported prices for only a portion of the services they provide. In addition, 12% of hospitals reported prices for services they do not provide. Only 6% of hospitals had complete concordance with price reporting and services they actually provide. Current compliance enforcement and penalties do not appear to be adequate to achieve the goals of the Hospital Price Transparency Rule.

Key words: price transparency; health policy; health care prices; health care markets.

Introduction

The Hospital Price Transparency Rule[1] was put into effect on January 1, 2021,[2] to create transparency for prices for health care services before seeking care and improve the ability of patients to shop for health care services. All nonfederal hospitals are required to comply with several statutory requirements under the rule. First, hospitals must make available a consumer-friendly webpage for prices of services. Second, hospitals must publish a machine-readable file detailing chargemaster prices for all services provided. Third, prices reported must reflect the price of all items and services, including but not limited to, "supplies, procedures, room and board, use of the facility and other items [generally described as facility fees], services of employed physicians and non-physician practitioners (generally reflected as professional charges), and any other items or services for which a hospital has established a charge."[1] Fourth, expanded price data for a variety of payers (eg, price-negotiated rates) must be published for 70 shoppable services selected by the Centers for Medicare and Medicaid Services (CMS) if provided by the hospital. To incentivize compliance under the rule, CMS has leveraged and continues to raise financial penalties for hospitals not in compliance. Over 730 hospitals have received warnings[3] and 14 hospitals have been fined thousands of dollars for failing to comply.[4] The extent to which hospitals have not met the requirements of the rule has prompted efforts to investigate hospital reporting and improve enforcement of the policy.

Whether or not the rule has led to meaningful reporting of hospital prices for the services they provide is not clear. The rule states that hospitals must "report as many of the 70 CMS-specified shoppable services that are provided by the hospital."[3] Ideally, hospitals would report prices for all the services they provide. A 2022 investigation for all acute care hospitals in the United States showed that only 5.7% of hospitals met reporting criteria under the rule.[5] However, such studies may unfairly characterize hospitals as noncompliant because they may not provide all shoppable services. To date, there has been limited comparison of publicly reported prices of hospitals in contrast to the actual services they provide.

The objective of this study was to evaluate hospital compliance under the Hospital Price Transparency Rule when taking into account if a hospital provides a shoppable service. To do so, we used publicly reported prices, as aggregated in the Turquoise Health dataset, and compared these with the CMS Provider of Services File to assess services provided by hospitals and the prices reported by hospitals. We hypothesized that, after taking into account whether or not the hospital actually provides the shoppable services, more hospitals would appear compliant with the reporting requirements of the Hospital Price Transparency Rule. These findings are particularly timely as US Congress debates whether to take this CMS rule and make it into formal legislation.[6]

Data and methods

Data sources

We leveraged 2 national data sources to investigate the prices reported and services provided by hospitals. First, we utilized the

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2023 CMS Provider of Services File. This file is the largest national dataset documenting hospitals within the United States. It provides data on structural features of hospitals, such as location, hospital type, ownership, and bed size. Additionally, the CMS Provider of Services Files provide longitudinal data on the types of services provided by hospitals in the United States.[7] In each annual report, 86 service line variables exist to assess a variety of services provided by hospitals, ranging from cardiac catheterization labs to ophthalmic services.

Second, Hospital Price Transparency data were collected from Turquoise Health. Turquoise Health compiles publicly reported price data from the hospital machine-readable files reported in concordance with the Hospital Price Transparency Rule. Pricing data include information on the price of the service, the shoppable service code using Current Procedure Codes (CPT) and Diagnosis Related Group Codes (DRG), the payer type, and the hospital reporting the price. We linked pricing data to hospitals through the CMS identification number. This dataset has been utilized in previous studies[8-12] assessing compliance with the rule. Because the collection methodology of Turquoise Health in collecting data is proprietary, we evaluated a sample of hospitals' price transparency data websites to provide evidence for the accuracy of Turquoise Health price data (Appendix S7).

Hospital cohort

To accurately evaluate price reporting among hospitals, we utilized the definition of a hospital, outlined in the statutes, which must comply with the Hospital Price Transparency Rule. Hospitals required to report prices under the rule are defined as any institution that meets standard licensing established by a state. This includes critical-access hospitals, specialty hospitals, non–Medicare-enrolled hospitals, and state-owned facilities.[1] Federally owned hospitals, such as Veterans Affairs hospitals, are excluded from price reporting mandates.[13] Using this definition, we included all non–federally owned hospitals. Potential duplicated data were accounted for by only including a single hospital per unique CMS identification number in our cohort. Because our analysis focused on price reporting and service provision, we only included hospitals that had complete data for the services provided within the CMS Provider of Services File ($n = 11\,792$; 90%) (Appendix S3).

Shoppable service prices

The Hospital Price Transparency Rule outlines several requirements for compliance when reporting shoppable service prices. Hospitals are required to publish chargemaster prices for all services provided by the hospital. To improve the shop-ability for common health care services, CMS requires hospitals to report expanded price data for 70 services (Appendix S1), specified by CPT and DRG codes. For these services, hospitals must report prices, including gross charges (list price), discounted cash prices (self-pay), third-party payer–specific negotiated charges (eg, commercial insurers, self-insured plans, managed care contracts for Medicare or Medicaid), and deidentified minimum- and maximum-negotiated charges. In addition to the 70 services specified by CMS, hospitals are required to report prices for an additional 230 services of their own choosing. While the additional 230 services are required under the rule, this investigation solely focused on the 70 CMS-specified services because of their mandatory reporting requirement without hospital choice. Using prices reported by hospitals, this investigation utilized 2 measures to evaluate price reporting. First, hospitals were considered to report "any price" for a service if the hospital reported at least 1 price for the service, regardless of the price type (eg, list price, price-negotiated rate). Second, hospitals were considered to report "all required prices" if the hospital reported at least 1 price for each of the following price types: list price, self-pay, and price-negotiated price. Under the rule, a fully compliant hospital would report at least 1 price for each of these categories. However, because there may be non-hospital factors that may influence if a hospital reports a specific price type (eg, areas without third-party managed Medicare Advantage plans), this investigation primarily assessed price reporting by evaluating if a hospital reports any price, inclusive of all price types, for a service. Hospital Price Transparency Rule data were queried for all of the 70 CMS-specified shoppable services from Turquoise Health on March 8, 2024.

Hospital services

The Hospital Price Transparency Rule specifies that a hospital must report prices for services that it provides.[1] Using the 2023 CMS Provider of Services File, we assessed all service line variables within the CMS Provider of Services File. For each service line variable, hospitals report if the service is (1) not provided, (2) provided by staff, (3) provided under arrangement, or (4) provided by staff and under arrangement. In this investigation, we considered hospitals to provide a service if they responded with any answer of 2 to 4 criteria. Utilizing these data allowed us to determine if a hospital should report prices for each of the 70 CMS-specified shoppable services. For example, if a hospital reported providing magnetic resonance imaging (MRI) services in the CMS Provider of Services File, then a compliant hospital should report all required prices for the CMS-specified service of MRI of the leg joint (CPT 73721). While hospitals are required to report chargemaster prices for all services provided, we limited our assessment to the 70 CMS-specified shoppable services because it is a statutory requirement under the Hospital Price Transparency Rule and these are the most reported shoppable services. Using the service line variables, we identified 32 out of the 70 CMS-specified shoppable services that could be determined as provided by hospitals using the Provider of Services data. The variables utilized to evaluate services provided by hospitals and the 32 shoppable services we assessed are outlined in Appendix S2. The 32 services that could be evaluated were across a variety of domains of care, including inpatient and outpatient procedures, imaging, and cancer screenings. In comparison, services required to be reported but that were not evaluated were primarily laboratory tests and services performed in the outpatient setting.

Statistical analysis

Our overall analysis had 4 primary goals. First, we assessed if hospitals report any price for the services they provide. This comparison was done by creating a ratio of 2 quantities at the hospital level: the total number of services for which a hospital reported any price and the total number of services for which a hospital provides. For example, a hospital that reported any price for 10 services and provided 20 services would have a ratio of 0.5. A perfectly reporting hospital would have a ratio of 1, in which they report prices for all the services they provide. Using a ratio between price reporting and providing services allowed us to understand if hospitals were reporting fewer, equal to, or

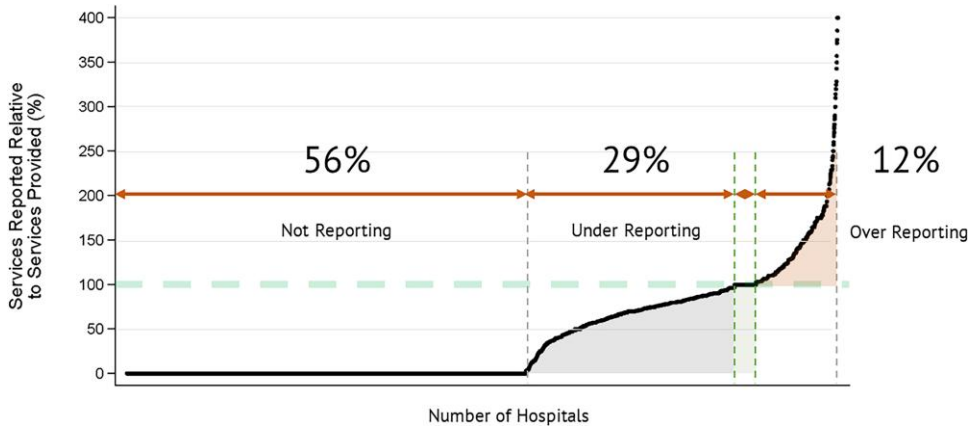

Figure 1. Prices reported relative to service provided for all nonfederal hospitals. Sources: Authors' analysis of number of services reported compared with number of services provided. Prices were collected from Turquoise Health on March 8, 2024. Service line provision variables were collected from the 2023 Centers for Medicare and Medicaid Services (CMS) Provider of Services File for all nonfederal hospitals. This graph displays the ratio of number of prices reported for services compared with the number of services provided across all nonfederal hospitals that provided at least 1 of the 32 shoppable services. A hospital that reports at least 1 price for a service is considered to report prices for that service. In a perfectly compliant world, we would expect a hospital to report prices for the exact number of services provided for the CMS-specified mandatory reported services (eg, if a hospital provides 6 shoppable services, we would expect prices reported for 6 services). Hospitals that report prices for fewer services than they provide are considered "Under Reporting." Hospitals that report prices for more services than they provide are considered "Over Reporting."

more prices for services relative to those they provide. The ratios of prices reported relative to services provided for hospitals in our sample are shown in Figure 1 and Appendix S6.

Second, we described the variation in hospital price reporting at the service level (Table 1). We divided our hospital cohort into 4 categories: hospitals that report any price for a service and provide a service, hospitals that report any price for a service and do not provide a service, hospitals that do not report prices and provide a service, and hospitals that do not report prices and do not provide a service. Correctly reporting hospitals are hospitals that report prices and provide a service, in addition to hospitals that do not report prices and do not provide a service. In addition to compliant reporting measures, this analysis also captures hospitals that report prices for services they do not provide.

Third, we calculated the percentage of hospitals that report any price or all required prices (eg, chargemaster, price-negotiated, cash price) for a service relative to all hospitals that provide a service. To date, evaluations of the Hospital Price Transparency Rule have looked at compliance at the hospital level, but it is not known if correct price reporting varies across services.

Fourth, we determined the proportion of all reported prices for a service that were reported by hospitals that did not provide a service. This analysis provides evidence on the quality of the data that are currently reported. Statistical analyses were performed using Stata 18.0 (StataCorp. 2023. Stata Statistical Software: Release 18. College Station, TX: StataCorp LLC). This study was considered exempt from the University of Michigan Investigation Review Board.

Secondary analysis

We performed several sensitivity analyses to further investigate prices reported by hospitals that do and do not provide a service. To determine if certain hospital features were associated with not reporting prices or reporting at least 1 price for a service that a hospital does not provide, we utilized an equality of proportions test. This method identifies hospital characteristics that are overrepresented among hospitals reporting prices for services not provided compared with the entire sample of hospitals.[12]

Additionally, we evaluated if there were differences in the averages of prices reported by hospitals that do provide a service compared with hospitals that do not provide a service. Because there is a known significant skew among pricing data, we performed 1% winsorization of prices by payer type (eg, self-pay, commercial, etc). A mixed-effects linear regression was performed to estimate differences in prices for services by hospitals providing and not providing a service. Because prices are reported at the hospital level and significant correlation can exist among prices reported by the same hospital, we utilized a random effect at the hospital level. Fixed effects were adjusted for payer class (eg, self-pay, chargemaster, price-negotiated, etc), bed size (<100 beds, 100–300 beds, >300 beds), hospital type (short-term, long-term, psychiatric, children's hospital, rehabilitation), hospital ownership (for-profit, not-for-profit, non–federal government owned), and state. In addition, we assessed if the risk-adjusted price variation for all prices would be significantly altered if prices reported by hospitals that do not provide a service were removed (Appendix S10). All *P* values were reported as 2-sided with .05 as the threshold for significance.

Limitations

Our results should be interpreted in the context of multiple limitations. First, this investigation assumes that a hospital not having associated price data within the Turquoise Health database indicates a hospital not reporting prices. While it could be the case that a hospital reports prices that are not within national datasets, the Turquoise Health database remains the largest and most robust dataset regarding Hospital Price Transparency data and has been utilized in a similar manner in previous investigations.[8,12,14-19] In addition, we found high concordance between Turquoise Health data and prices reported on hospital websites for a sample of hospitals in our investigation. Second, this investigation does not describe compliance in price reporting across all of the 70 CMS-specified shoppable services. Our investigation only

Table 1. Price reporting by hospitals that do and do not provide a service.

Service	Reports any prices		Does not report prices	
	Hospital provides service	Hospital does not provide service	Hospital provides service	Hospital does not provide service
Routine obstetric care for vaginal delivery	886 (8%)	310 (3%)	4011 (34%)	6585 (56%)
Routine obstetric care for C-section	843 (7%)	289 (2%)	4054 (34%)	6606 (56%)
Routine obstetric care for previous C-section	673 (6%)	259 (2%)	4224 (36%)	6636 (56%)
CT, head	3711 (31%)	995 (8%)	1431 (12%)	5655 (48%)
CT, abdomen, contrast	3682 (31%)	977 (8%)	1460 (12%)	5673 (48%)
CT, pelvis, contrast	3573 (30%)	958 (8%)	1569 (13%)	5692 (48%)
MRI, leg joint	3374 (29%)	1055 (9%)	1322 (11%)	6041 (51%)
MRI, brain, contrast	3412 (29%)	1091 (9%)	1284 (11%)	6005 (51%)
MRI, lower spine	3417 (29%)	1081 (9%)	1279 (11%)	6015 (51%)
Mammogram, both breasts	3709 (31%)	42 (0%)	7403 (63%)	638 (5%)
Mammogram, bilateral	3758 (32%)	44 (0%)	7354 (62%)	636 (5%)
Mammogram, 1 breast	3846 (33%)	42 (0%)	7266 (62%)	638 (5%)
Laser cataract removal	1262 (11%)	803 (7%)	1542 (13%)	8185 (69%)
Cataract removal	1027 (9%)	688 (6%)	1777 (15%)	8300 (70%)
Knee cartilage removal	1887 (16%)	681 (6%)	1830 (16%)	7394 (63%)
Shoulder arthroscopy	1539 (13%)	515 (4%)	2178 (18%)	7560 (64%)
Joint replacement (hip or knee)	2190 (19%)	812 (7%)	1527 (13%)	7263 (62%)
Diagnostic heart catheterization	1344 (11%)	981 (8%)	634 (5%)	8833 (75%)
Prostatectomy	1478 (13%)	95 (1%)	6469 (55%)	3750 (32%)
Prostate biopsy	2629 (22%)	186 (2%)	5318 (45%)	3659 (31%)
Inguinal hernia repair	2648 (22%)	164 (1%)	5299 (45%)	3681 (31%)
Cholecystectomy	2662 (23%)	157 (1%)	5285 (45%)	3688 (31%)
Tonsil removal	1981 (17%)	120 (1%)	5966 (51%)	3725 (32%)
EGD	3125 (27%)	331 (3%)	4822 (41%)	3514 (30%)
EGD, biopsy	3189 (27%)	337 (3%)	4758 (40%)	3508 (30%)
Colonoscopy, snare	3059 (26%)	285 (2%)	4888 (41%)	3560 (30%)
Colonoscopy, biopsy	3089 (26%)	305 (3%)	4858 (41%)	3540 (30%)
Colonoscopy, diagnostic	3127 (27%)	343 (3%)	4820 (41%)	3502 (30%)
Noncervical fusion	1878 (16%)	706 (6%)	1937 (16%)	7271 (62%)
Cardiac valve with MCC	1019 (9%)	1092 (9%)	802 (7%)	8879 (75%)
Cervical fusion	1784 (15%)	666 (6%)	2031 (17%)	7311 (62%)
X-ray, lower back	4587 (39%)	76 (1%)	6525 (55%)	604 (5%)

Sources: Authors' analysis of number of services reported compared with number of services provided. Prices were collected from Turquoise Health on March 8, 2024. Service line provision variables were collected from the 2023 CMS Provider of Services File for all nonfederal hospitals. This table displays price reporting for shoppable services by hospitals that do and do not provide a shoppable service. A hospital that reports at least 1 price for a service is considered to "report any price." In a perfectly compliant world, we would expect only hospitals that provide a shoppable service to report prices and hospitals that do not provide a shoppable service to not report prices. Cells are reported as the number of hospitals. The percentage distribution is shown in parentheses and calculated for each service (ie, row percentages).
Abbreviations: CT, computed tomography; EGD, esophagogastroduodenoscopy; MCC, major complications or comorbidity; MRI, magnetic resonance imaging.

assessed CMS-specified services that could be determined as provided or not provided by hospitals using the CMS Provider of Services File. Because the Provider of Services File does not report services provided by hospitals at the CPT/DRG code level, this may lead to selection bias for the services that were evaluated. As such, our findings are limited to only assessing compliance across a limited sample of the CMS-specified shoppable services However, the services that were evaluated in this investigation were from a variety of health care service lines and provide a broad assessment of compliance across different domains of health care services. The services that were not included in this investigation were primarily outpatient services and laboratory tests, which may be provided in a non-hospital setting and do not exclusively reflect a "hospital-based service" to which the Hospital Price Transparency Rule applies. Additionally, these services are commonly a required component for procedural services and are significantly less expensive, making them less likely to be a service for which patients would shop. Even with that limitation in mind, our findings still underscore significant noncompliance with the rule. Third, the scope of this investigation is primarily descriptive and does not elucidate causal mechanisms that may explain the results. Nonetheless, we did attempt secondary analyses (eg, comparative prices at compliant and noncompliant hospitals) to identify potential underlying mechanisms. Finally, this investigation does not assess compliance for all requirements under the Hospital Price Transparency Rule, such as user-friendly display for patients to easily assess the price of a service. However, these additional criteria focus on presentability, and would first require accurately reported price data.

Results

A total of 13 285 hospitals were identified (including rehabilitation hospitals, psychiatric hospitals, children's hospitals), of which 11 792 were non-federal hospitals that reported data for services provided. The majority of hospitals were short-term hospitals ($n = 7514$; 64%) and critical-access hospitals ($n = 1464$; 12%) (Appendix S4).

There was variation in the services provided by hospitals. For example, 11 191 hospitals (95%) provided at least 1 of the 32 shoppable services. A majority of hospitals provided diagnostic radiology services (94%), while few hospitals provided neurosurgical services (15%) (Appendix S5). A total of 5 541 954 prices were reported for the 32 shoppable services as of March 8, 2024. The highest number of prices reported was 431 311 for MRI of the leg joint, while the lowest number of reported prices was 25 006 for routine obstetric care for a previous C-section.

Price reporting among hospitals that provided at least 1 service varied significantly. For example, 6245 (56%) hospitals providing at least 1 shoppable service that requires public price reporting did not report any prices. Of hospitals reporting a price, the majority of hospitals ($n = 3266$; 66%) reported prices for fewer services than they provide. Many hospitals ($n = 1343$; 12%) reported prices for services they do not provide (Figure 1). When evaluating only acute care hospitals ($n = 7295$) that provide at least 1 shoppable service, 4113 hospitals (56%) reported prices for no services and 809 (11%) reported prices for more services than they provide. Overall, 740 hospitals (6.3%) reported prices in line with the services they provide.

Relative to all hospitals in our sample, hospitals that did not report prices were more likely to be smaller (ie, <100 beds; 76% vs 58%; $P < .001$), psychiatric hospitals (17% vs 2%; $P < .001$), and for-profit hospitals (35% vs 31%; $P < .001$). Additionally, hospitals that reported at least 1 price for a service they did not provide were more likely to be a critical-access hospital (21% vs 12%; $P < .001$), a not-for-profit hospital (41% vs 30%; $P < .001$), and a medium-sized hospital (ie, 101–300 beds; 31% vs 23%; $P < .01$) (Appendix S8).

Reporting of prices by hospitals that provided a service varied across types of services (Table 1). For example, of 4897 hospitals providing obstetric services, 673 hospitals (14%) reported any price for routine obstetric care for a previous C-section (CPT 59610), while 238 hospitals (5%) reported all required price types (ie, chargemaster, price-negotiated, cash price, etc) (Figure 2).

In addition, reporting of prices for services not provided by a hospital varied by service. For example, of the 147 030 prices reported for diagnostic cardiac catheterization (CPT 93452), 53 668 prices (37%) came from hospitals not providing cardiac catheterization laboratory services. The remainder of the services and their reporting are summarized in Figure 3. There were no clear trends for differences in prices reported by hospitals providing a service compared with those not providing a service using the multivariable mixed-effects model (Appendix S9). Additionally, excluding prices reported by hospitals not providing a service did not alter the risk-adjusted price variation for services (Appendix S10).

Discussion

Our present evaluation of the Hospital Price Transparency Rule in the context of services provided by hospitals has 2 principal findings. First, we identified significant underreporting by hospitals who provide services that require price transparency. Second, we also observed significant overreporting, where hospitals report prices for services they do not provide. Taken together, these findings highlight additional concerns for the Hospital Price Transparency Rule and the usability of these data for patients.

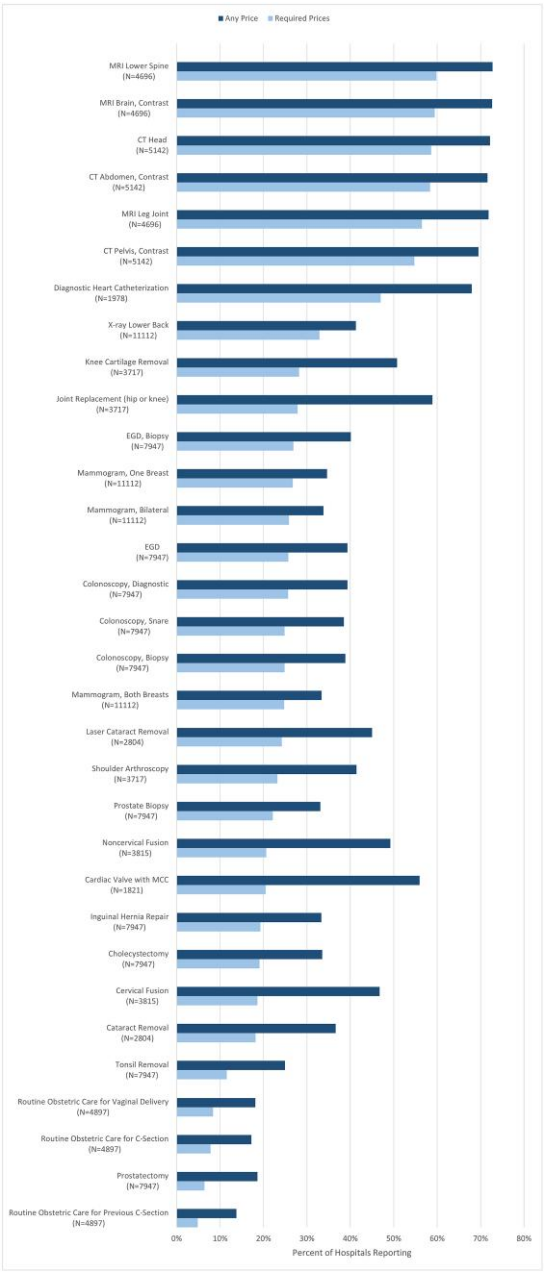

Figure 2. Price reporting among hospitals providing a service. Sources: Authors' analysis of number of services reported compared with number of services provided. Prices were collected from Turquoise Health on March 8, 2024. Service line provision variables were collected from the 2023 Centers for Medicare and Medicaid Services (CMS) Provider of Services File for all nonfederal hospitals. This figure displays the proportion of hospitals reporting prices for a service relative to all hospitals providing a service. Two different measures of price reporting among hospitals providing a service were evaluated. First, hospitals reporting any price for a service relative to all hospitals providing a service are shown under "Any Price." Second, under the Hospital Price Transparency Rule, hospitals are required to report a chargemaster price, price-negotiated price, and cash price. Hospitals are considered reporting "Required Prices" if they report at least 1 chargemaster price, price-negotiated price, and discounted cash price for the service. Bars are shown as the percentage of hospitals reporting any price or all required prices for a service relative to all hospitals providing a given service. For example, 411 (8.4%) hospitals reported at least 1 list price, self-pay, and price-negotiated price for Routine Obstetric Care for a C-Section among 4897 hospitals providing obstetric services. This ratio is shown as the "Required Prices" for Routine Obstetric Care for a C-Section. Abbreviations: CT, computed tomography; EGD, esophagogastroduodenoscopy; MCC, major complications or comorbidities; MRI, magnetic resonance imaging.

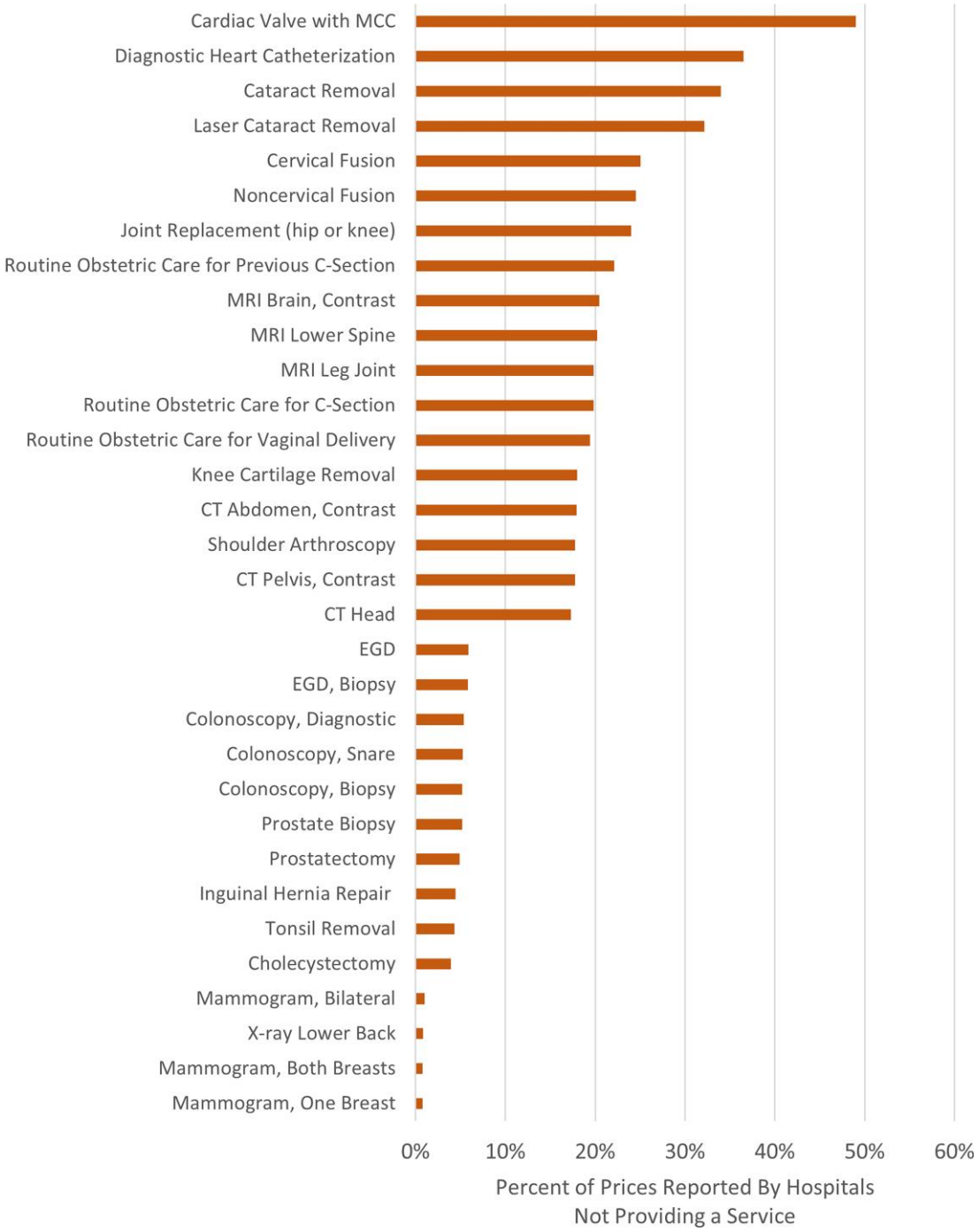

Figure 3. Percentage of prices reported by hospitals not providing a service. Sources: Authors' analysis of number of services reported compared with number of services provided. Prices were collected from Turquoise Health on March 8, 2024. Service line provision variables were collected from the 2023 Centers for Medicare and Medicaid Services (CMS) Provider of Services File for all nonfederal hospitals. This figure assesses the total number of prices reported for shoppable services. The bars display the proportion of prices reported by hospitals that do not provide a shoppable service compared with all prices reported for a shoppable service. Abbreviations: CT, computed tomography; EGD, esophagogastroduodenoscopy; MCC, major complications or comorbidities; MRI, magnetic resonance imaging.

Previous reports have raised concern about hospitals not reporting prices for services. For example, early investigations estimated price reporting to be only 5.7% of hospitals, while more recent efforts estimate that 70% of hospitals report prices under the rule.[5,11] While these prior works suggest improvement, they also only focused on acute care hospitals. Our present study, taking into account all of the hospitals required to report data (eg, critical-access hospitals, children's hospitals, psychiatric hospitals), found that still less than half report any prices and that hospital types that have not been previously investigated also are not reporting prices in line with the requirements of the Hospital Price Transparency Rule.

While prior work has focused on underreporting of prices, our present study raises a new concern. Namely, that a large portion of reported prices are from hospitals that do not provide the service. Reporting inaccurate or unusable data has been a significant limitation in other price transparency policies, such as the more recent Transparency in Coverage

Rule, which requires private insurers to report prices for services.[20] Overreporting now severely limits the usability of data reported under the Transparency in Coverage Rule, due to concerns of duplicity of prices, uninterpretable file sizes, and variation in reporting.[21-24] Taken together, this suggests that, while nonreporting was an original concern when implementing the policy, overreporting and data validity may be an increasing threat to policy efforts to improve price transparency for health care services.

While the reason for this overreporting is unclear, there are several possibilities. First, price negotiation between hospitals and insurers may include bundles of services, irrespective if the hospital provides the service. As such, a hospital may, in fact, have a price-negotiated rate for a service they do not offer. These prices have been coined "ghost codes" and have become a concern for data being reported under the Hospital Price Transparency Rule.[23] Previous investigations that have utilized price transparency data without accounting for ghost codes may be subject to biases of inaccurate data. While our investigation found that prices reported by hospitals that do and do not provide a service did not vary for most services, we found that the quantity of prices reported by hospitals for services not provided varied widely across services and may influence analyses at the service level. Taken together, future obstacles to achieving compliancy under price transparency rules may be increasingly shaped by overreporting of unclear data. Second, hospitals have already expressed frustration with the administrative burden of the policy.[25] As such, rather than spend additional effort to tailor reporting, they may instead err on the side of overreporting. In doing so, it would likely alleviate some of the administrative burden. Current enforcement policies may also explain why hospitals err toward reporting prices. Levying fines for hospitals that do not report prices has led to an increase in reporting price files[26]; however, there are no current guidelines or enforcement measures for hospitals reporting prices for services they do not provide. Unfortunately, such a strategy may have an unintended consequence for patients. With more and more prices available on a hospital website (including services they do not provide), patients may have more trouble finding accurate information on where to seek care.

This investigation highlights several implications for the relevance and future of the Hospital Price Transparency Rule. First, for patients, the rule may not ultimately help identify the information they need to shop for health care services. Specifically, because hospitals appear to both under- and overreport, patients will likely need to utilize additional measures to verify a publicly reported price before seeking services. Second, researchers performing investigations using price transparency data should take measures to address under- and overreporting by hospitals, which may confound analyses. Identifying and incorporating additional datasets that can validate the services provided by hospitals may improve the validity of evidence and more accurately evaluate the status of price transparency. Finally, policymakers may utilize these findings to help inform future iterations of the rule to improve its impact. First, compliancy evaluations may integrate comparisons of price data reported between hospitals, under the Hospital Price Transparency Rule, and insurers, under the Transparency in Coverage Rule, to identify nonconcordant data. Second, future enforcement policies of the Hospital Price Transparency and Transparency in Coverage Rule should consider additional guidance on who needs to report which services and to caution against overreporting that may confuse patients shopping for services. Possible strategies may include mandating more standardized formats, harsher penalties for underreporting, and new penalties for overreporting for services that hospitals do not provide.

Conclusion

The Hospital Price Transparency Rule made advancements in improving price transparency in health care services. However, this investigation demonstrated that price transparency data may be limited by under- and overreporting of prices by hospitals, raising concerns for the usability of these data. Future policy improvement efforts may improve price transparency by clarifying which hospitals should report certain services. These findings are timely and significant as US Congress considers enacting this CMS rule on price transparency into legislation.[6,27]

Supplementary material

Supplementary material is available at *Health Affairs Scholar* online.

Conflicts of interest

Dr. Andrew Ibrahim serves on the Boards for Academy Health and the Center for Health Design, and has received editorial fees from the Journal of the American Medical Association. Please see ICMJE form(s) for author conflicts of interest. These have been provided as supplementary materials.

Notes

1. Department of Health and Human Services. Medicare and Medicaid Programs: CY 2020 hospital outpatient PPS policy changes and payment rates and ambulatory surgical center payment system policy changes and payment rates. Price transparency requirements for hospitals to make standard charges public. *Fed Regist*. 2019;84(229):65524-65606.
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