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Title Page

Variation in Reported Hospital Cash Prices Across the United States and How They Compare to Reported Payer-Specific Negotiated Rates

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Abstract

There is little empirical evidence on the hospital "cash" prices that self-paying patients (e.g., self-paying uninsured patients) face, and little empirical evidence of how these hospital cash prices compare to payer-specific negotiated rates. To address this gap in the literature, I use new data from U.S. hospitals on their reported cash prices and payer-specific negotiated rates for fourteen "shoppable" hospital services that are subject to mandated disclosure under a new federal rule that took effect on January 1, 2021. I find that the cash prices reported by hospitals for these services vary meaningfully across the United States. For example, hospitals with brain MRI cash prices in the 90th percentile of the distribution of my data have cash prices 7.9 times more expensive than hospitals in the 10th percentile. I also find that it is common for the reported cash price to be lower than several payer-specific negotiated rates within a given hospital. For example, for a given private payer (e.g. Aetna, Cigna), the share of reported payer-specific negotiated rates that are higher than the cash price within the same hospital ranges from 41.0 to 57.3 percent. These findings raise further questions about how hospitals decide to price services for the self-pay uninsured population and how these cash pricing decisions compare to transaction rates they negotiate with other payers.

JEL classification: I11, L10, L11

Keywords: hospital prices, uninsured, cash prices

Declaration of interest: none

1. Introduction

Prices play an important role in explaining the sizable differences in healthcare spending between the United States (U.S.) and other countries (Anderson et al., 2003; Anderson et al., 2019). Recent work studying hospital prices in the United States uses health insurance claims data recording the actual negotiated rates between hospitals and private insurance companies to understand the variation in hospital prices faced by the privately insured (Cooper et al., 2019; Craig et al. 2021). However, the self-pay cash price (henceforth, "cash price") for hospital services—for example, those applicable to self-paying patients who are uninsured—are not captured in these claims data and remain largely unexplored by economists because of data availability.

To address this gap in the literature, I use new data from U.S. hospitals on their reported cash prices and payer-specific negotiated rates for fourteen "shoppable" hospital services that are subject to mandated disclosure under a new federal rule that took effect on January 1, 2021. I use these data to document the variation in hospital cash prices across the United States for fourteen hospital services. I find that the cash prices reported by hospitals for these services vary meaningfully across the United States. For example, hospitals with brain MRI cash prices in the 90th percentile of the distribution of my data have cash prices 7.9 times more expensive than hospitals in the 10th percentile. I also map the average cash price for a brain MRI and for an abdominal ultrasound in each Hospital Referral Region (HRR) to provide a picture of the variation in cash prices across HRRs and to further document the extent of this variation across the country.

Furthermore, I also compare, for the same service within the same hospital, the reported cash price to the set of reported payer-specific negotiated rates. I find that it is common for the cash price to be lower than several payer-specific negotiated rates within a given hospital. For example, 41.4 percent of the reported payer-specific negotiated rates for a CT scan of the pelvis with contrast are higher than the reported cash price within the same hospital. For other hospital services in the data, this share ranges from 38.9 to 50.0 percent. Moreover, for a given private payer (e.g. Aetna, Cigna), the share of reported payer-specific negotiated rates that are higher than the cash price within the same hospital ranges from 41.0 to 57.3 percent. This finding is interesting since it raises the question of whether this is evidence of poor bargaining by insurers, who are representing privately insured consumers in transaction price negotiations with hospitals.

Documenting the variation in cash prices for hospital services in the United States and comparing them to payer-specific negotiated rates is important for public policy for several reasons. First, hospital care represents nearly 6% of the U.S. GDP. Second, self-pay uninsured consumers bear the full cost of hospital services, and the uninsured rate in the United States increased from 10% in 2016 to 10.9% in 2019 (Tolbert et al. 2020). Moreover, if medical bills are unpaid, the outstanding amount can be classified as medical debt and sent to debt collectors. In June 2020, an estimated 17.8% of individuals in the United States had medical debt (Kluender et al. 2021). Third, even among insured individuals, hospital cash prices may still be relevant for individuals seeking services that are not covered by their health plan. Finally, empirical analysis of how hospital pricing behavior affects self-pay uninsured patients and evidence of how cash prices compare to payer-specific negotiated rates are scarce.

2. Background on the new federal regulation and Turquoise Health Co. data

A new federal regulation that took effect on January 1, 2021, requires each hospital operating in the United States to provide a single, comprehensive, machine-readable file containing the following standard charges for a list of "shoppable" services provided by the hospital (e.g., office visits, panel tests, CT scans, MRIs, etc.): (1) gross charge, (2) cash price, (3) all payer-specific negotiated charges, and (4) de-identified minimum and maximum negotiated charges. The regulation defines "gross charge" as "the charge for an individual item or service that is reflected on a hospital's chargemaster, absent any discounts," the cash price as "the charge that applies to an individual who pays cash (or cash equivalent) for a hospital item or service," and the payer-specific negotiated charge as "the charge that a hospital has negotiated with a third party payer for an item or service." The regulation also clarifies that the reported cash price "would reflect the discounted rate published by the hospital, unrelated to any charity care or bill forgiveness that a hospital may choose or be required to apply to a particular individual's bill. Thus, the cash price is a standard charge offered by the hospital to a group of individuals who are self-pay" (Price Transparency Requirements for Hospitals to Make Standard Charges Public, 2021). Two important groups who might self-pay are (1) individuals without health insurance and (2) underinsured individuals (e.g., individuals seeking services that are not covered by their health plan).

The federal rule defines "shoppable" services as those "that can be scheduled by a healthcare consumer in advance." The rule stipulates that hospitals must make public their standard charges for "as many of the 70 [CMS-specified] shoppable services […] that are provided by that hospital, and as many additional hospital-selected shoppable services as are necessary for a combined total of at least 300 shoppable services." The 70 CMS-specified shoppable services, which are listed in Table 3 of the final rule, were finalized through the notice and comment rulemaking process and are based on an analysis of state price transparency requirements, an analysis of high-volume services and high-cost procedures using claims data and a review by CMS medical officers (Price Transparency Requirements for Hospitals to Make Standard Charges Public, 2021).

This paper uses a dataset made available for researchers by Turquoise Health Co., a startup dedicated exclusively to scraping all U.S. hospital websites to find these machine-readable files, cleaning the data, and aggregating them. The dataset is publicly available for researchers, and access instructions are available on the company's website (https://turquoise.health/researchers). The Turquoise Health dataset contains the facility fee portion for a curated list of fourteen shoppable services mandated for disclosure by the Centers for Medicare & Medicaid Services (CMS). Eleven of the fourteen services are part of the 70 CMS-specified shoppable services of the final rule. The other three services are: Emergency Department Visits Level 3 (CPT Code 99283), Level 4 (CPT Code 99284), and Level 5 (CPT Code 99285). Although not considered shoppable, the three levels of emergency services were included in the Turquoise Health data because emergency visits are a very common, high-volume hospital service.

The dataset does not include the professional fees associated with the hospital service provided. Professional fees are fees related to services of employed physicians and non-physician practitioners, while facility fees refer to items and services provided by a hospital to a patient in connection with an inpatient admission or an outpatient department visit (e.g. supplies, room and

board, procedures, use of the facility, and other items). Usually, professional fees are billed separately from the facility fee portion. The raw dataset contains 449,831 observations representing 2,183 different hospitals, where each observation is a hospital-health plan-service-price.

The dataset includes the hospital name and the health system it belongs to; the hospital location, including street address, city, zip code, county, and state; a description of each shoppable service, including the relevant numeric code (e.g., CPT, MS-DRG, etc.); a description of the payer-specific plan associated with each price (e.g., Aetna PPO, Cigna HMO, list price, cash price); and the corresponding payer-specific negotiated rate applicable to that payer. The geographic information allows me to uniquely identify a hospital provider and the Hospital Referral Region (HRR) that it belongs to, and the payer and plan information allow me to compare payer-specific negotiated rates to cash prices within the same hospital provider.

It is important to also mention some limitations of the Turquoise Health dataset. Not all hospitals report a self-pay cash price for all services, and hospitals may not necessarily report all payer-specific negotiated rates for all services as stipulated in the new federal rule. Since hospitals do not uniformly comply with the new federal rule, Turquoise Health Co. warns researchers that the dataset is provided "as is" and therefore all the analysis in this paper should be interpreted in light of what hospitals are reporting on their websites via machine-readable files. While being transparent about the data limitations, Turquoise Health Co. nevertheless has a strong incentive in finding, collecting, and cleaning these data. The fact that hospitals are not uniformly complying with the new federal rule has been documented previously (Gondi et al. 2021). However, despite these limitations, these data offer a unique opportunity to study cash prices and to compare, for the same service within the same hospital, the cash price to payer-specific negotiated rates (when the hospital reports both).

3. Hospital cash prices for the same service vary meaningfully across the U.S.

In this section, I document the variation in self-pay cash prices across the United States using the cash prices reported by hospitals complying with the new federal rule. **Table 1** reports summary statistics for the fourteen hospital services contained in the Turquoise Health dataset. I find that hospital cash prices reported by hospitals under the new rule vary significantly across the United States. For example, the cash price for an MRI scan of the brain before and after contrast (CPT 70553) at hospitals in the 90^{th} percentile of the cash price distribution is 7.90 times higher than that at hospitals in the 10^{th} percentile. This ratio is 5.74 for a new patient office visit or other outpatient 30-minute visit (CPT 99203) and 7.43 for a new patient office visit or other outpatient 45-minute visit (CPT 99205).

Of course, some of this variation may be reflecting unobserved patient severity or unobserved quality across hospitals. However, meaningful cash price variation is also present for plausibly homogenous services like a kidney function blood test panel (CPT 80069), an ultrasound of the abdomen (CPT 76700), and a routine electrocardiogram with interpretation and report (CPT 93000). Taken together, these descriptive results suggest that cash prices for hospital services reported by hospitals under the new federal rule vary meaningfully across the United States.

Table 1
Summary Statistics for the Reported Self-Pay Cash Prices across the 14 Services Contained in the Dataset

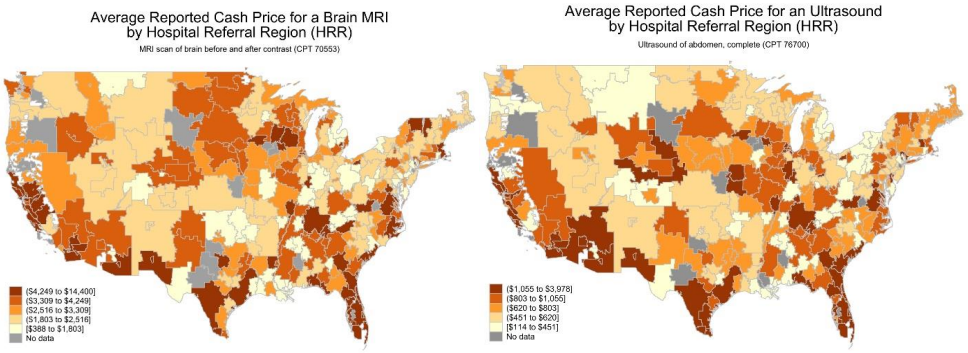
Service Description	Code Type	Code	Service Category	Number of Providers	Mean	Std. Dev.	min	p10	p90	max	p90/p10 ratio
MRI scan of brain before and after contrast	CPT	70553	MRI	1,731	3,169	2,518	328	778	6,139	14,476	7.90
Colonoscopy, diagnostic	CPT	45378	Digestive	1,034	2,553	3,233	89	579	4,994	37,451	8.62
CT scan, pelvis, with contrast	CPT	72193	CT scan	1,657	1,913	1,770	174	489	3,806	12,392	7.79
Electrocardiogram, routine, with interpretation and report	CPT	93000	Cardiovascular	398	116	93	5	21	208	446	9.90
Emergency, Level 3	CPT	99283	Emergency care	1,475	815	694	74	221	1,755	4,477	7.96
Emergency, Level 4	CPT	99284	Emergency care	1,469	1,232	977	119	357	2,495	7,062	7.00
Emergency, Level 5	CPT	99285	Emergency care	1,469	1,759	1,488	165	501	3,575	10,704	7.14
Kidney function blood test panel	CPT	80069	Organ or disease oriented panels	1,647	165	256	9	22	322	1,783	14.79
Knee arthroscopic cartilage removal	CPT	29881	Musculoskeletal	678	7,667	6,389	565	1,838	17,320	30,922	9.42
New patient office or other outpatient visit, typically 30 minutes	CPT	99203	Office visit	1,084	240	202	26	80	459	1,345	5.74
New patient office or other outpatient visit, typically 45 minutes	CPT	99204	Office visit	1,081	313	279	28	91	649	1,865	7.15
New patient office or other outpatient visit, typically 60 minutes	CPT	99205	Office visit	998	386	361	28	103	761	2,493	7.43
Ultrasound of abdomen, complete	CPT	76700	Ultrasound	1,728	832	755	105	196	1,616	4,817	8.25
Uterine and adnexa procedures, non-malignancy	MSDRG	743	Female reproductive	707	25,419	17,142	3,673	7,803	49,052	81,789	6.29

Source: Turquoise Health Limited Research Dataset

4. Average hospital cash prices across Hospital Referral Regions

Figure 1 maps the average reported cash price in each HRR using the available data for a brain MRI and an abdominal ultrasound. These maps provide descriptive evidence that there is a meaningful amount of variation in the cash prices applicable to self-pay individuals (e.g., the uninsured) across HRRs. For example, self-pay patients getting a brain MRI within the HRR in the 90th percentile of the HRR average cash price distribution (e.g., Cape Girardeau, MO) will pay, on average, 4.26 times more than self-pay patients getting a brain MRI within the HRR in the 10th percentile of the HRR average cash price distribution (e.g., Bridgeport, CT).

Figure 1



5. Self-pay cash prices can be lower than payer-specific negotiated rates

The data reported by hospitals under the new rule also allow me to compare, for the same service, the reported cash price and the reported payer-specific negotiated rates within the same hospital when the hospital reports both. Importantly, this comparison allows me to hold hospital quality constant. **Figure 2** graphs and compares these rates for a CT scan of the pelvis (CPT 72193). Each darkly shaded dot in **Figure 2** represents a single hospital's reported cash price, and hospitals are ordered by cash price in ascending order. Lightly shaded dots above and below each hospital's darkly shaded dot represent the reported negotiated prices for the CT scan within the same hospital.

Figure 2 qualitatively demonstrates that it is common for the reported cash price to be lower than several reported payer-specific negotiated rates within the same hospital. This also happens for other services in the data. For example, **Table 2** shows, for a given hospital service, the share of reported payer-specific negotiated rates that are higher than the reported cash price within the same hospital. Notice that this share ranges from 38.9 to 50.0 percent across the fourteen services.

Figure 2

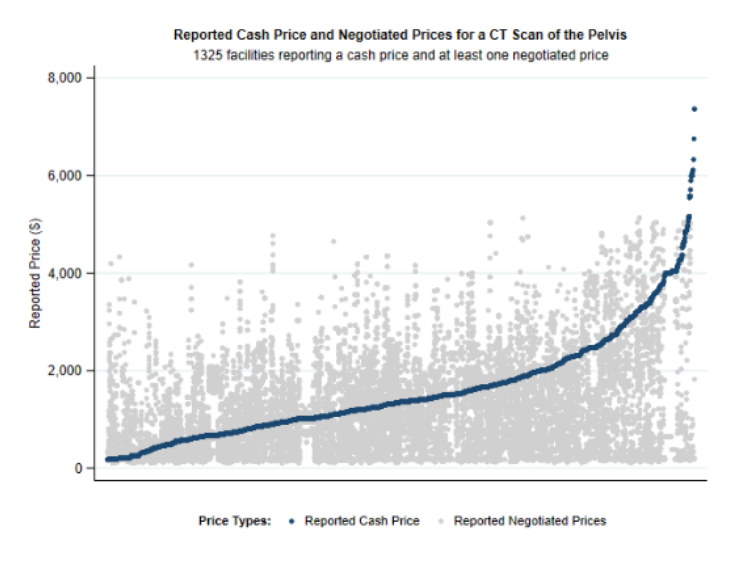


Table 2
Share of reported payer-specific negotiated rates that are higher than the cash price within the same hospital across the 14 services in the data

Service Description	Number of providers reporting a cash price and at least one negotiated rate	Number of payer-specific negotiated rates	Number of payer-specific rates that are higher than the cash price within the same provider	Percent higher than cash
MRI scan of brain before and after contrast	1,385	34,094	13,268	38.9%
Colonoscopy, diagnostic	891	22,233	10,544	47.4%
CT scan, pelvis, with contrast	1,325	31,452	13,024	41.4%
Electrocardiogram, routine, with interpretation and report	331	6,410	3,143	49.0%
Emergency, Level 3	1,158	37,671	17,425	46.3%
Emergency, Level 4	1,153	38,660	18,035	46.7%
Emergency, Level 5	1,155	38,420	17,692	46.0%
Kidney function blood test panel	1,271	31,778	13,180	41.5%
Knee arthroscopic cartilage removal	562	13,090	6,467	49.4%
New patient office or other outpatient visit, typically 30 minutes	786	19,991	9,634	48.2%
New patient office or other outpatient visit, typically 45 minutes	785	19,613	9,807	50.0%
New patient office or other outpatient visit, typically 60 minutes	717	18,381	9,080	49.4%
Ultrasound of abdomen, complete	1,390	35,546	14,539	40.9%
Uterine and adnexa procedures, non-malignancy	597	14,144	7,051	49.9%

Source: Turqoise Health Limited Research Dataset

To provide further evidence of this stylized fact, **Table 3** shows, for a given insurer, the share of reported payer-specific negotiated rates that are higher than the reported cash price within the same hospital. I focus on Aetna, Blue Cross Blue Shield, Cigna, Humana and United Health since they

are major national carriers. I also include a government-related payer category which groups plans whose payers are listed as Medicaid, Medicare, Tricare, Veterans Affairs, and state agencies insuring their state employees, among others. In this case, for a given payer (e.g. Humana, Cigna), the share of reported payer-specific negotiated rates that are higher than the cash price within the same hospital ranges from 41.0 to 57.3 percent. This range is notably higher than 18.4%, the percent of reported government rates that are higher than cash within the same hospital and service.

Table 3
Share of reported payer-specific negotiated rates that are higher than the cash price within the same hospital across major payers

Payer	Number of providers reporting a cash price and at least one negotiated rate	Number of payer-specific negotiated rates	Number of payer-specific rates that are higher than the cash price within the same provider	Percent higher than cash
Aetna	1,092	21,104	11,751	55.7%
BCBS (Blue Cross Blue Shield)	1,136	32,905	13,489	41.0%
Cigna	975	14,998	8,601	57.3%
Humana	697	8,293	3,988	48.1%
United Health	970	16,970	8,609	50.7%
Government Plans	1,212	90,926	16,771	18.4%
Other	1,410	176,287	99,680	56.5%

Source: Turqoise Health Limited Research Dataset

This finding is interesting since individuals purchasing private health insurance are paying monthly premiums in exchange for having access to health care services within a network of providers under the promise that their insurer is also negotiating the lowest possible rates for services delivered within that hospital network. On the other hand, the qualitative analysis above shows that it is common to find cases were the cash prices applicable to the uninsured (who have no one to negotiate on their behalf and lack the bargaining power of an insurance company) are lower than some payer-specific rates. This suggests that further research is needed to understand how hospitals decide to price services for the uninsured population and how these cash pricing decisions compare to transaction rates they negotiate with other payers. It also raises the question of whether this is evidence of poor bargaining by insurers, who are representing privately insured consumers in price negotiations with hospitals.

Conclusion

Using new data reported by U.S. hospitals on the cash price and payer-specific negotiated rates applicable to hospital services, I find that the cash prices reported by hospitals vary meaningfully across the United States. To the best of my knowledge, this is the first paper to document such variation using a nationally comprehensive dataset that contains self-pay cash prices reported by hospitals across the United States. I also find that it is common for the cash price to be lower than several payer-specific negotiated rates within a hospital. Further research should be focused on understanding the economic forces behind the patterns identified in this paper. Also, more research is needed in terms of understanding how hospitals decide to price their services to self-paying, uninsured patients. This paper offers a first attempt at establishing some stylized facts on the set of cash prices they are reporting under the new federal regulation and how they compare to payer-specific rates.

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