Levinson Z, Qureshi N, Liu JL, Whaley CM.
Trends in hospital prices paid by private health plans varied substantially across the US.
Health Aff (Millwood). 2022;41(4).

APPENDIX

A.1. Variable construction

We relied on the May 1, 2021 calendar year version of the RAND Hospital Data file. The managers of the RAND Hospital Data file generate these data by cleaning and processing annual cost report data submitted by hospitals to the Healthcare Provider Cost Reporting Information System (HCRIS). Among other steps, they standardize cost reporting periods by apportioning data into calendar years and federal fiscal years.[1] The RAND Hospital Data are available for a fee, though a limited version is available for free in the most recent year. Raw HCRIS data are online for free, as are Stata code that apply basic cleaning procedures.[2] Appendix Exhibit 1 displays the HCRIS variables and calculations used to derive the RAND Hospital Data estimates of commercial-to-Medicare price ratios.

Appendix Exhibit 1. HCRIS variables and calculations used to derive the RAND Hospital Data estimate of commercial-to-Medicare price ratios

Variable	Label	Source (formula or 2552-10 worksheet, column, and line number)
commercial_to_mdcr_est	Ratio of estimated commercial revenue-to-charge ratio to Medicare revenue-to-charge ratio (2552-10 only) [commercial_to_mdcr_est]	=commercial_rev_to_charges_est/mdcr_rev_to_charges;
commercial_rev_to_charges_est	Estimated commercial revenue-to-charge ratio (2552-10 only) [commercial_rev_to_charges_est]	=commercial_rev_est/commercial_charges_est;
mdcr_rev_to_charges	Medicare revenue-to-charge ratio [mdcr_rev_to_charges]	=sum(mdcr_inpat_revs,mdcr_outpat_revs)/sum(mdcr_inpat_charges,mdcr_outpat_charges);
commercial_charges_est	Estimated charges from commercial payers, i.e. net patient revenues minus revenues from Medicare (fee-for-service plus estimated Medicare Advantage), Medicaid, SCHIP, state/local indigent (2552-10 only) [commercial_charges_est]	=(source_2552_10>0)*max(0,sum(inpat_charges_total,outpat_charges_total)-sum(mdcd_charges,schip_charges,stloc_indigent_charges,chgs_charity_patients_only10,mdcr_outpat_charges,mdcr_inpat_charges,mdcr_adv_charges_est));
commercial_rev_est	Estimated revenues from commercial payers, i.e. net patient revenues minus revenues from Medicare (fee-for-service plus estimated Medicare Advantage), Medicaid, SCHIP, state/local indigent (2552-10 only) [commercial_rev_est]	=(source_2552_10>0)*max(0,net_patient_rev-sum(mdcd_net_revenue_only10, mdcd_DSH_revenue_only10,schip_net_revenue_only10,stloc_indigent_net_rev_only10,priv_grants_for_charity_only10, govt_grants_for_uncomp_only10, pymt_insured_charity_only10,mdcr_inpat_revs,mdcr_outpat_revs,mdcr_adv_rev_est));
source_2552_10	Cost report data is from form 2552-10 (0/1) [source_2552_10]	
inpat_charges_total	Inpatient charges, Total (2552-10 only) [inpat_charges_total]	n10_C000001_00600_20200
outpat_charges_total	Outpatient charges, Total (2552-10 only) [outpat_charges_total]	n10_C000001_00700_20200
mdcd_charges	Medicaid charges [mdcd_charges]	n10_S100000_00100_00600
schip_charges	Stand-alone SCHIP charges [schip_charges]	n10_S100000_00100_01000
stloc_indigent_charges	Charges for patients covered under state or local indigent care program [stloc_indigent_charges]	n10_S100000_00100_01400

Variable	Label	Source (formula or 2552-10 worksheet, column, and line number)
chgs_charity_patients_only10	Total initial obligation (charges) of patients approved for charity care (2552-10 only) [chgs_charity_patients_only10]	n10_S100000_00300_02000
mdcr_outpat_charges	Medicare outpatient charges [mdcr_outpat_charges]	n10_D00A185_00200_20200
mdcr_inpat_charges	Medicare inpatient charges [mdcr_inpat_charges]	=sum(mdcr_inpat_charges_adpeds,mdcr_inpat_charges_ICU,mdcr_inpat_charges_CCU,mdcr_inpat_charges_BICU,mdcr_inpat_charges_SICU,mdcr_inpat_charges_OSCU,mdcr_inpat_charges_anc_outp_oth);
mdcr_adv_charges_est	Estimate of billed charges for services (inpatient plus outpatient) provided to enrollees in Medicare Advantage plans [mdcr_adv_charges_est]	=sum(mdcr_inpat_charges,mdcr_outpat_charges)*(mdcr_hmo_inpat_days/mdcr_inpat_days);
net_patient_rev	Net patient revenue (charges minus contractual allowances and discounts) [net_patient_rev]	n10_G300000_00100_00300
mdcd_net_revenue_only10	Net revenue from Medicaid (2552-10 only) [mdcd_net_revenue_only10]	n10_S100000_00100_00200
mdcd_DSH_revenue_only10	DSH or supplemental payments from Medicaid (2552-10 only) [mdcd_DSH_revenue_only10]	n10_S100000_00100_00500
schip_net_revenue_only10	Net revenue from stand-alone SCHIP (2552-10 only) [schip_net_revenue_only10]	n10_S100000_00100_00900
stloc_indigent_net_rev_only10	Net revenue from state or local indigent care program (2552-10 only) [stloc_indigent_net_rev_only10]	n10_S100000_00100_01300
priv_grants_for_charity_only10	Private grants, donations, or endowment income restricted to funding charity care (2552-10 only) [priv_grants_for_charity_only10]	n10_S100000_00100_01700
govt_grants_for_uncomp_only10	Government grants, appropriations or transfers for support of hospital operations (2552-10 only) [govt_grants_for_uncomp_only10]	n10_S100000_00100_01800
pymt_insured_charity_only10	Partial payment by insured patients approved for charity care (2552-10 only) [pymt_insured_charity_only10]	n10_S100000_00200_02200
mdcr_inpat_revs	Medicare inpatient revenues [mdcr_inpat_revs]	=sum(mdcr_inpat_revs_pps_woimeadj, mdcr_inpat_revs_costreimb);
mdcr_outpat_revs	Medicare outpatient revenues [mdcr_outpat_revs]	=sum(mdcr_outpat_lesser_costchg,mdcr_outpat_pps_pymts);
mdcr_adv_rev_est	Estimate of revenues for services (inpatient plus outpatient) provided to enrollees in Medicare Advantage plans [mdcr_adv_rev_est]	=mdcr_adv_charges_est*mdcr_rev_to_charges;
mdcr_inpat_charges_adpeds	Medicare inpatient program charges, adults and pediatrics (general routine care) [mdcr_inpat_charges_adpeds]	n10_D30A180_00200_03000
mdcr_inpat_charges_ICU	Medicare inpatient program charges, Intensive care unit [mdcr_inpat_charges_ICU]	n10_D30A180_00200_03100

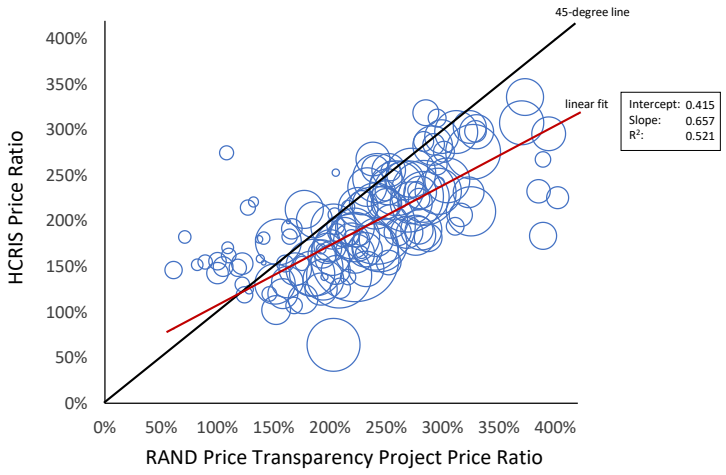
Variable	Label	Source (formula or 2552-10 worksheet, column, and line number)
mdcr_inpat_charges_CCU	Medicare inpatient program charges, Coronary care unit [mdcr_inpat_charges_CCU]	n10_D30A180_00200_03200
mdcr_inpat_charges_BICU	Medicare inpatient program charges, Burn intensive care unit [mdcr_inpat_charges_BICU]	n10_D30A180_00200_03300
mdcr_inpat_charges_SICU	Medicare inpatient program charges, Surgical intensive care unit [mdcr_inpat_charges_SICU]	n10_D30A180_00200_03400
mdcr_inpat_charges_OSCU	Medicare inpatient program charges, Other special care unit [mdcr_inpat_charges_OSCU]	n10_D30A180_00200_03500
mdcr_inpat_charges_anc_outp_oth	Medicare inpatient program charges, ancillary service cost centers, outpatient service cost centers, and other reimbursable cost centers [mdcr_inpat_charges_anc_outp_oth]	n10_D30A180_00200_20200
mdcr_hmo_inpat_days	Inpatient days, Medicare HMO (i.e. Medicare Advantage) [mdcr_hmo_inpat_days]	n10_S300001_00600_00200
mdcr_inpat_days	Inpatient days, Medicare [mdcr_inpat_days]	n10_S300001_00600_01400
mdcr_inpat_revs_pps_woimeadj	Medicare inpatient revenues from prospective payment system (without managed care IME payment adjustment) [mdcr_inpat_revs_pps_woimeadj]	=sum(mdcr_inpat_pps_pymts,-mdcr_dgme_pymt,(FY_BGN_DT_1>=input('19971001',yymmdd8.))*sum(-mdcr_reimb_bad_debt,mdcr_adjstmnt_reimb_bad_debt));
mdcr_inpat_revs_costreimb	Medicare inpatient revenues from cost reimbursement (for critical access hospitals [CAHs]) [mdcr_inpat_revs_costreimb]	=sum(mdcr_inpat_costreim_primpayer, mdcr_inpat_costreim_costsrvcs);
mdcr_outpat_lesser_costchg	Medicare outpatient, lesser of costs or charges [mdcr_outpat_lesser_costchg]	n10_E00A18B_00100_02100
mdcr_outpat_pps_pymts	Medicare outpatient payments under prospective payment [mdcr_outpat_pps_pymts]	n10_E00A18B_00100_02400
mdcr_inpat_pps_pymts	Medicare inpatient payments under prospective payment system [mdcr_inpat_pps_pymts]	n10_E00A18A_00100_05900
mdcr_dgme_pymt	Medicare direct graduate medical education payment, Clinic [mdcr_dgme_pymt]	n10_E00A18A_00100_05200
mdcr_reimb_bad_debt	Medicare allowable bad debts, Observation Beds (see instructions) [mdcr_reimb_bad_debt]	n10_E00A18A_00100_06400
mdcr_adjstmnt_reimb_bad_debt	Medicare adjusted reimbursable bad debts, Other Outpatient Service (specify) [mdcr_adjstmnt_reimb_bad_debt]	n10_E00A18A_00100_06500
mdcr_inpat_costreim_primpayer	Medicare inpatient under cost reimbursement, primary payer payments [mdcr_inpat_costreim_primpayer]	n10_E30A185_00100_00500
mdcr_inpat_costreim_costsrvcs	Medicare inpatient under cost reimbursement, costs of covered services [mdcr_inpat_costreim_costsrvcs]	n10_E30A185_00100_01900
FY_BGN_DT_1	Beginning date of hospital fiscal year (first cost report used) [FY_BGN_DT_1]	

SOURCE: May 2021 RAND Hospital Data public use file documentation.

A.2. Comparison to other price estimates. We compared our estimates of commercial-to-Medicare price ratios at the hospital and HRR level to results from the RAND Price Transparency Project, which includes estimates of price ratios from more granular data but for fewer hospitals and years.[3] To generate estimates of commercial-to-Medicare price ratios, the authors of the RAND Price Transparency Project: (1) collected commercial claims data from about 120 self-insurance employers and from all-payer claims databases (APCDs) in six states, (2) took the sum of commercial payer allowed amounts for each hospital, (3) simulated Medicare payments based on administrative formulas for the same set of services at each hospital, and (4) took the ratio of commercial allowed amounts and simulated Medicare payments for each hospital.[3] When comparing the RAND Price Transparency Project results to our estimates, we focused on the six states that contributed APCD data: Connecticut, Colorado, Delaware, Maine, New Hampshire, and Rhode Island. The RAND Price Transparency Project covers a relatively large set of commercial payers in these states and may therefore be more comparable to price ratio estimates from RAND Hospital Data, which include all commercial payers except for Medicare Advantage and Medicaid managed care plans. We compared price ratio estimates from 2018, the most recent and comprehensive data available under the RAND Price Transparency Project.

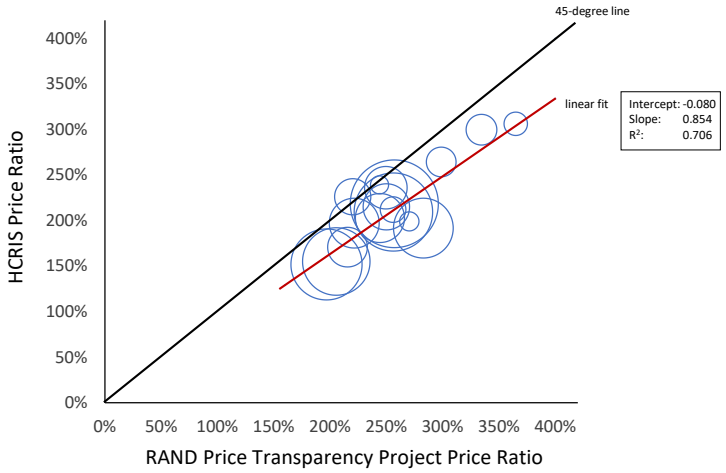
Price ratio estimates from the RAND Price Transparency Project are typically larger than estimates from our study, though there is a strong correlation between the two (Appendix Exhibits 2 and 3). We estimated a linear regression model relating price ratios from the RAND Price Transparency Project against estimates from our study, weighting by commercial discharge-equivalents. Hospital-level regressions yielded an R^2 of 0.52 and HRR-level regressions yielded an R^2 of 0.71 (Appendix Exhibits 2 and 3).

Appendix Exhibit 2. Hospital-level commercial-to-Medicare hospital price ratios in HCRIS Data and RAND Price Transparency Project data, 2018



SOURCE: Authors' analysis of 2018 Healthcare Provider Cost Reporting Information System (HCRIS) data and 2018 RAND Price Transparency Project data.
NOTES: Price ratios reflect estimated commercial revenue-to-charge ratios divided by Medicare revenue-to-charge ratios. Bubble sizes reflect the number of commercial discharge-equivalents based on HCRIS data. Estimates are of a linear regression model relating HCRIS price ratio estimates with RAND Price Transparency Project price ratios, weighting by commercial discharge-equivalents.

Appendix Exhibit 3. HRR-level commercial-to-Medicare hospital price ratios in HCRIS Data and RAND Price Transparency Project data, 2018



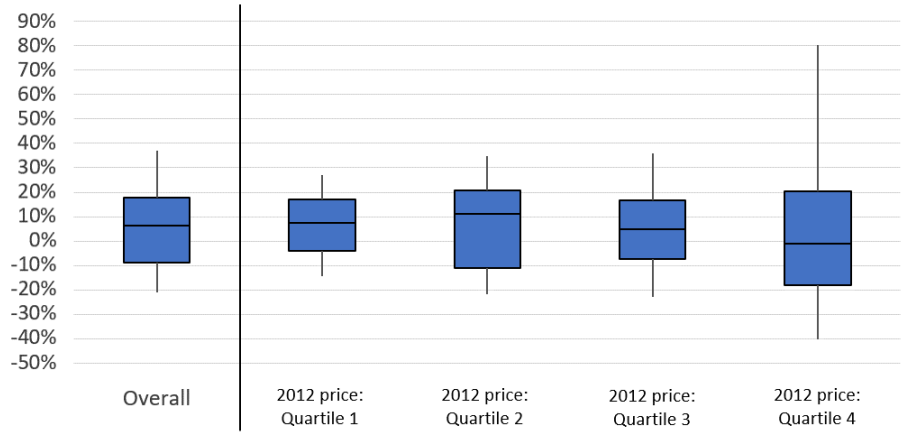
SOURCE: Authors' analysis of 2018 Healthcare Provider Cost Reporting Information System (HCRIS) data and 2018 RAND Price Transparency Project data.
NOTES: Price ratios reflect estimated commercial revenue-to-charge ratios divided by Medicare revenue-to-charge ratios. Bubble sizes reflect the number of commercial discharge-equivalents based on HCRIS data. Estimates are of a linear regression model relating HCRIS price ratio estimates with RAND Price Transparency Project price ratios, weighting by commercial discharge-equivalents.

A.3. Hospital-level results. Our primary analyses focused on HRR-level trends in commercial-to-Medicare price ratios. In this section, we evaluate price ratio trends at the hospital level. These results should be interpreted with caution. For example, hospital-level data may be less precise than HRR-level data to the extent that some hospitals have large reporting errors that are muted when averaged with other hospitals in the same region. We focused on interquartile ranges (weighted by 2012 commercial DEs) as a measure of hospital-level variation in order to draw attention away from potential outliers.

With this caveat in mind, we find that price ratio trends varied substantially across hospitals, reflecting variations in trends both across and within HRRs. The 25th percentile of hospital-level price ratio trends was a 16 percentage point decrease and the 75th percentile was a 28 percentage point increase, yielding a 44 percentage point interquartile range. The interquartile range at the HRR-level was 27 percentage points and the average within-HRR hospital-level interquartile range (weighting by 2012 commercial DEs) was 41 percentage points.

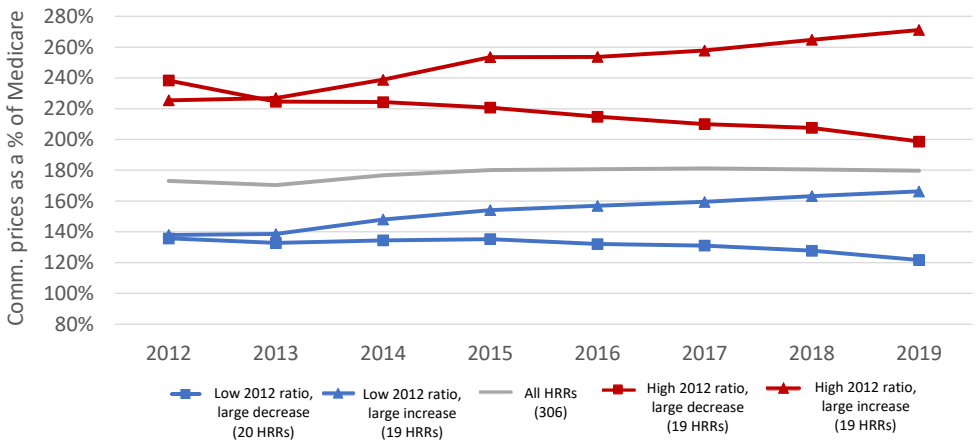
A.4. Additional results. The following exhibits show additional results described in the main text. Appendix Exhibit 4 shows the variation in the change in price ratios from 2012 to 2019, by quartile of 2012 price ratios. Appendix Exhibits 5 and 6 show the results of supplementary analyses that hold hospital volume constant and hold hospital price ratios constant, respectively. Appendix Exhibits 7, 8, and 9 map price ratio levels and trends for every HRR in the country (Appendix Exhibit 9 is identical to Exhibit 4 in the main text). Appendix Exhibit 10 shows the commercial-to-Medicare price ratios for each HRR by year, and the quartiles of 2012 prices and quartiles of the price change from 2012 to 2019.

Appendix Exhibit 4. Percentage point change in commercial-to-Medicare price ratios, by initial price ratio quartile, 2012-2019



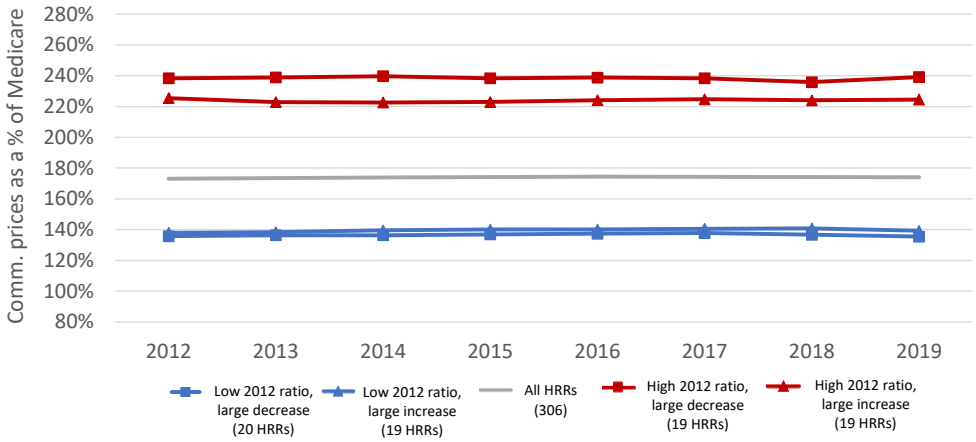
SOURCE: Authors' analysis of 2012 and 2019 Healthcare Provider Cost Reporting Information System (HCRIS) data.
NOTES: Price ratio estimates reflect estimated commercial revenue-to-charge ratios divided by Medicare revenue-to-charge ratios. Each box plot displays the median and interquartile range. Whiskers display the 10th and 90th percentiles. Price ratios are weighted by the number of commercial discharge-equivalents.

Appendix Exhibit 5. Trends in commercial-to-Medicare price ratios holding hospital volume constant but allowing hospital price ratios to vary



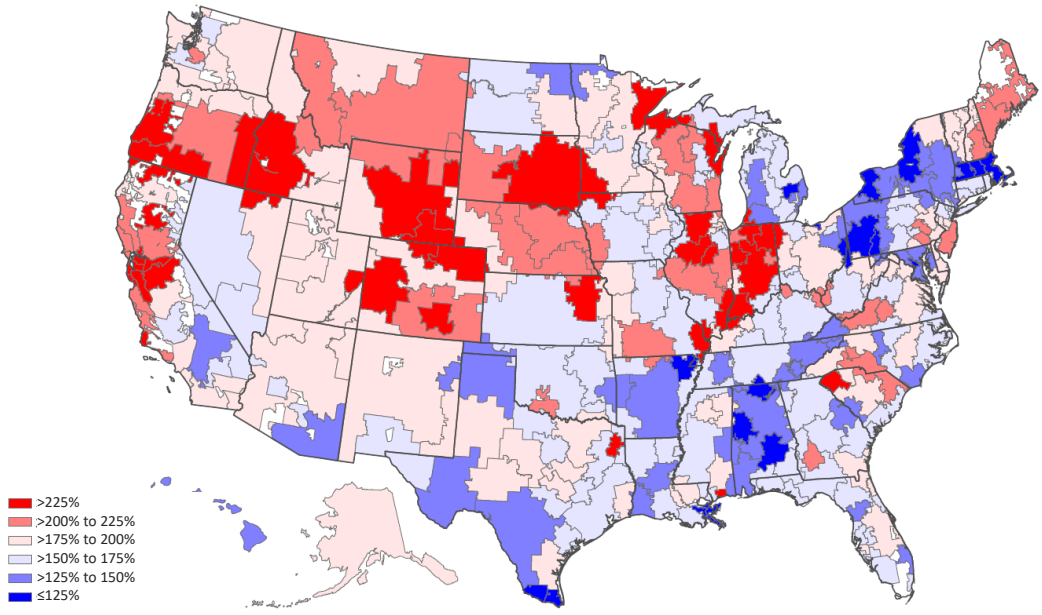
SOURCE: Authors' analysis of 2012-2019 Healthcare Provider Cost Reporting Information System (HCRIS) data.
NOTES: Price ratio estimates reflect estimated commercial revenue-to-charge ratios divided by Medicare revenue-to-charge ratios. High 2012 ratios and low 2012 ratios refer to HRRs with the highest 25% (top quartile) and lowest 25% (bottom quartile) of commercial-to-Medicare price ratios in the initial year of the study period. Large increase and large decrease refer to HRRs that, within their initial price ratio group, are in the top and bottom price ratio change quartiles as measured over the 2012-2019 study period. Price ratios are weighted by the number of commercial discharge equivalents. HRR is hospital referral region.

Appendix Exhibit 6. Trends in commercial-to-Medicare price ratios holding hospital price ratios constant but allowing hospital volume to vary



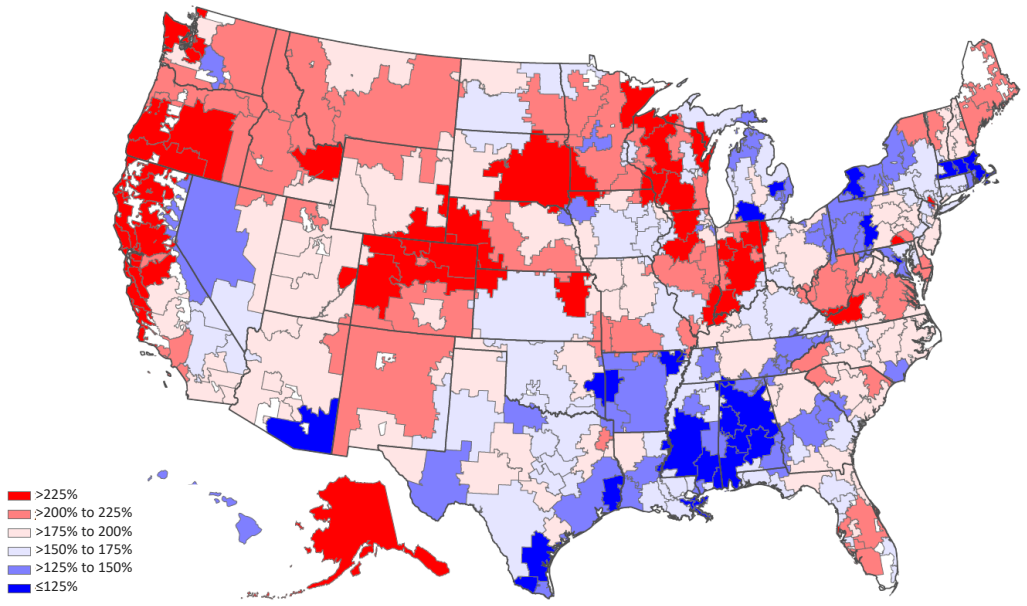
SOURCE: Authors' analysis of 2012-2019 Healthcare Provider Cost Reporting Information System (HCRIS) data.
NOTES: Price ratio estimates reflect estimated commercial revenue-to-charge ratios divided by Medicare revenue-to-charge ratios. High 2012 ratios and low 2012 ratios refer to HRRs with the highest 25% (top quartile) and lowest 25% (bottom quartile) of commercial-to-Medicare price ratios in the initial year of the study period. Large increase and large decrease refer to HRRs that, within their initial price ratio group, are in the top and bottom price ratio change quartiles as measured over the 2012-2019 study period. Price ratios are weighted by the number of commercial discharge equivalents. HRR is hospital referral region.

Appendix Exhibit 7. Commercial-to-Medicare hospital price ratios in 2012, by Hospital Referral Region (HRR)



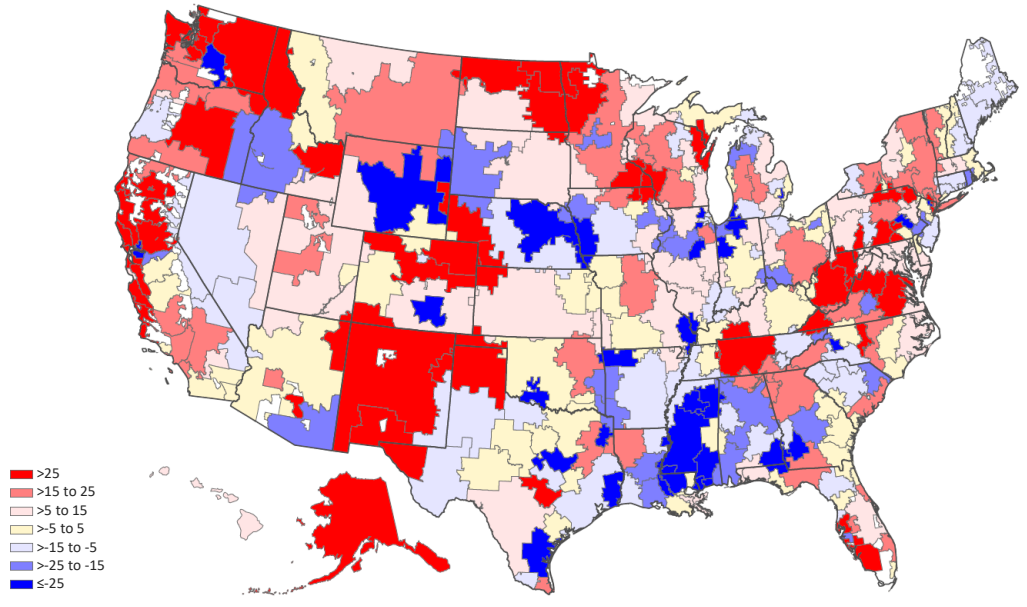
SOURCE: Authors' analysis of 2012–19 Healthcare Cost Report Information System (HCRIS) data.
NOTES: Price ratio estimates reflect estimated commercial revenue-to-charge ratios divided by Medicare revenue-to-charge ratios. Areas with no color are not part of an HRR.

Appendix Exhibit 8. Commercial-to-Medicare hospital price ratios in 2019, by Hospital Referral Region (HRR)



SOURCE: Authors' analysis of 2012–19 Healthcare Cost Report Information System (HCRIS) data.
NOTES: Price ratio estimates reflect estimated commercial revenue-to-charge ratios divided by Medicare revenue-to-charge ratios. Areas with no color are not part of an HRR.

Appendix Exhibit 9. Percentage point change in commercial-to-Medicare hospital price ratios from 2012 to 2019, by Hospital Referral Region (HRR)



SOURCE: Authors' analysis of 2012–19 Healthcare Cost Report Information System (HCRIS) data.
NOTES: Price ratio estimates reflect estimated commercial revenue-to-charge ratios divided by Medicare revenue-to-charge ratios. Areas with no color are not part of an HRR.

Appendix Exhibit 10. Trends in commercial-to-Medicare price ratios, by HRR

HRR City	2012 qrtile	2012 (%)	2013 (%)	2014 (%)	2015 (%)	2016 (%)	2017 (%)	2018 (%)	2019 (%)	Perc pt. change	Change qrtile
Tacoma, WA	4	222	202	209	215	198	268	300	337	115	4
Chico, CA	4	237	233	283	343	295	307	332	338	101	4
San Mateo County, CA	4	246	247	267	295	281	297	331	329	83	4
Santa Barbara, CA	4	282	291	294	309	304	315	349	362	80	4
Salinas, CA	4	221	261	277	294	283	281	283	290	69	4
Bend, OR	4	222	172	253	246	228	236	297	288	66	4
Napa, CA	4	222	218	239	251	225	251	251	276	54	4
Alameda County, CA	4	251	246	255	289	322	295	293	294	43	4
Sacramento, CA	4	215	211	205	229	240	244	250	257	42	4
San Francisco, CA	4	209	218	232	241	244	253	255	248	39	4
San Jose, CA	4	227	233	269	270	267	261	263	264	38	4
Green Bay, WI	4	239	247	260	266	271	264	272	277	37	4
Santa Rosa, CA	4	224	222	233	247	255	262	261	260	36	4
San Luis Obispo, CA	4	200	214	244	250	229	224	223	234	34	4
Greeley, CO	4	266	261	288	306	303	293	296	294	28	4
Billings, MT	4	203	206	201	206	214	223	225	224	21	4
Marshfield, WI	4	215	216	238	262	263	233	206	236	21	4
Roanoke, VA	4	210	196	207	233	254	230	227	230	20	4
Madison, WI	4	211	228	234	239	232	237	228	230	19	4
Medford, OR	4	249	252	263	277	268	265	253	265	16	3
Rockford, IL	4	246	242	249	247	257	258	262	260	15	3
Springfield, IL	4	202	206	215	220	219	213	214	217	14	3
Fort Wayne, IN	4	242	243	247	241	244	250	250	254	12	3
Duluth, MN	4	262	270	233	229	266	270	272	274	11	3
Salem, OR	4	209	208	224	243	245	228	226	220	11	3
Sioux Falls, SD	4	226	216	225	237	237	237	238	237	11	3
Colorado Springs, CO	4	206	199	214	234	243	242	236	216	10	3
Milwaukee, WI	4	206	210	219	218	222	216	219	214	7	3
Urbana, IL	4	211	219	203	199	202	203	215	218	7	3
Santa Cruz, CA	4	240	251	285	299	256	253	257	246	6	3
Modesto, CA	4	282	238	273	287	300	295	287	286	4	3
Topeka, KS	4	239	223	227	237	239	233	234	241	2	3
Fort Collins, CO	4	238	238	235	234	245	252	251	239	1	3
Lancaster, PA	4	215	224	244	248	241	229	218	216	1	3
Ventura, CA	4	207	191	203	215	213	206	233	208	1	3
Indianapolis, IN	4	246	232	250	239	242	246	248	246	0	3
Grand Junction, CO	4	263	287	265	301	292	286	271	262	-1	3

HRR City	2012 qrtile	2012 (%)	2013 (%)	2014 (%)	2015 (%)	2016 (%)	2017 (%)	2018 (%)	2019 (%)	Perc pt. change	Change qrtile
Huntington, WV	4	204	193	202	205	208	199	196	202	-2	3
Missoula, MT	4	205	208	227	215	210	219	217	201	-4	2
Springfield, MO	4	210	196	206	216	213	211	211	205	-5	2
Muncie, IN	4	209	243	283	240	228	222	209	203	-6	2
Wausau, WI	4	210	225	243	254	252	246	211	203	-8	2
Eugene, OR	4	240	228	247	242	231	218	227	232	-9	2
Lincoln, NE	4	218	234	236	212	221	223	209	209	-9	2
Charlotte, NC	4	203	188	199	221	213	203	198	194	-9	2
Camden, NJ	4	202	200	195	190	190	194	190	191	-11	2
Greenville, SC	4	227	234	226	231	253	227	201	215	-11	2
Portland, ME	4	215	198	208	213	215	221	210	203	-12	2
Evansville, IN	4	252	244	247	235	237	228	233	240	-12	2
Bangor, ME	4	222	217	233	239	231	226	219	208	-13	2
Manchester, NH	4	210	204	204	208	204	200	192	196	-14	2
Boulder, CO	4	236	230	228	230	238	241	232	222	-14	2
Florence, SC	4	220	216	213	211	207	212	202	205	-15	2
Boise, ID	4	241	247	239	231	226	225	229	223	-18	2
Covington, KY	4	210	177	181	187	189	193	197	192	-18	2
Peoria, IL	4	253	252	259	258	247	174	204	234	-19	2
Lynchburg, VA	4	204	199	192	201	207	203	188	185	-20	2
Stockton, CA	4	234	236	227	245	222	214	206	215	-20	1
Gary, IN	4	218	204	214	186	193	182	189	195	-23	1
Rapid City, SD	4	203	188	167	163	166	171	177	178	-25	1
Omaha, NE	4	206	201	201	195	191	177	176	181	-25	1
Reading, PA	4	206	195	185	185	188	190	185	177	-29	1
Munster, IN	4	215	219	199	206	208	206	209	185	-30	1
Contra Costa County, CA	4	314	282	295	301	286	306	333	273	-40	1
Longview, TX	4	264	256	427	440	320	312	230	224	-40	1
South Bend, IN	4	254	228	238	243	243	231	231	211	-43	1
Albany, GA	4	219	183	193	192	188	192	185	173	-46	1
Cape Girardeau, MO	4	255	223	213	239	218	213	214	209	-46	1
Bloomington, IL	4	254	264	262	255	245	253	223	207	-47	1
St. Joseph, MI	4	233	248	267	249	247	246	181	182	-51	1
Hickory, NC	4	223	199	181	182	176	168	175	171	-52	1
Casper, WY	4	246	241	245	236	217	208	196	193	-52	1
Lawton, OK	4	220	206	189	179	180	176	179	167	-54	1
Pueblo, CO	4	275	228	213	227	244	233	200	197	-78	1
Lafayette, IN	4	357	341	318	303	320	307	291	279	-78	1

HRR City	2012 qrtile	2012 (%)	2013 (%)	2014 (%)	2015 (%)	2016 (%)	2017 (%)	2018 (%)	2019 (%)	Perc pt. change	Change qrtile
Gulfport, MS	4	267	262	270	213	180	179	168	158	-109	1
La Crosse, WI	3	197	235	297	329	321	304	286	296	99	4
York, PA	3	190	202	208	219	231	241	253	265	75	4
Denver, CO	3	185	187	197	207	215	218	222	248	63	4
Redding, CA	3	187	182	207	237	233	277	253	250	63	4
Clearwater, FL	3	190	184	217	216	221	236	259	246	56	4
Seattle, WA	3	197	189	206	227	224	231	235	236	39	4
Rochester, MN	3	180	146	169	169	173	189	208	219	39	4
Anchorage, AK	3	198	196	213	225	226	223	224	236	38	4
Idaho Falls, ID	3	193	204	207	209	212	227	229	230	37	4
Morgantown, WV	3	186	193	202	204	210	217	222	222	36	4
Fargo/Moorhead MN, ND	3	188	193	197	205	204	216	227	221	32	4
Richmond, VA	3	180	181	203	208	203	205	202	208	29	4
Albuquerque, NM	3	187	185	194	204	213	179	220	214	27	4
Spokane, WA	3	176	175	181	191	182	204	202	202	26	4
Los Angeles, CA	3	181	182	189	201	208	210	211	204	23	4
Orange County, CA	3	192	188	187	200	208	203	204	212	19	4
Burlington, VT	3	190	208	219	228	230	220	211	207	17	4
Columbus, OH	3	181	177	180	187	197	196	192	198	17	4
Ogden, UT	3	191	190	199	205	219	216	209	208	17	4
Portland, OR	3	193	201	219	205	206	204	206	210	17	3
Ormond Beach, FL	3	174	180	182	184	170	171	186	191	17	3
Asheville, NC	3	187	176	176	185	180	205	201	203	17	3
Provo, UT	3	178	180	177	184	196	200	205	194	16	3
Minneapolis, MN	3	185	185	189	198	200	201	204	201	16	3
Salt Lake City, UT	3	181	183	184	193	199	198	200	196	15	3
Salisbury, MD	3	195	195	199	206	199	189	185	209	14	3
Wilkes-Barre, PA	3	182	183	184	183	184	190	193	194	12	3
Orlando, FL	3	189	186	198	201	198	205	205	201	12	3
Winchester, VA	3	180	184	182	193	194	190	188	191	11	3
Joplin, MO	3	193	182	198	205	215	218	211	204	11	3
Terre Haute, IN	3	191	198	190	190	200	193	204	202	11	3
Owensboro, KY	3	182	193	201	201	212	210	206	192	10	3
Dayton, OH	3	183	185	183	193	195	193	194	193	10	3
Newport News, VA	3	193	184	188	189	191	189	188	203	9	3
Arlington, VA	3	180	177	188	197	197	181	183	188	8	3
Allentown, PA	3	180	182	182	207	201	212	212	188	8	3
Great Falls, MT	3	181	176	194	194	183	182	186	186	5	3

HRR City	2012 qrtile	2012 (%)	2013 (%)	2014 (%)	2015 (%)	2016 (%)	2017 (%)	2018 (%)	2019 (%)	Perc pt. change	Change qrtile
Cleveland, OH	3	191	191	190	192	195	191	189	196	5	3
Kansas City, MO	3	196	188	197	202	208	207	202	200	4	2
Wilmington, DE	3	193	194	200	198	194	198	200	197	3	2
Abilene, TX	3	197	220	244	210	172	175	180	199	2	2
Winston-Salem, NC	3	177	164	166	188	189	183	181	179	2	2
Victoria, TX	3	174	186	209	205	167	176	175	175	1	2
New Brunswick, NJ	3	184	185	184	176	190	195	189	185	1	2
Lebanon, NH	3	176	175	180	179	176	180	176	176	1	2
Jacksonville, FL	3	182	166	167	173	167	170	178	182	0	2
San Diego, CA	3	199	191	191	200	194	186	203	198	-1	2
Fresno, CA	3	191	186	204	204	181	179	186	190	-1	2
Paducah, KY	3	195	177	194	219	211	210	208	194	-1	2
San Angelo, TX	3	187	190	174	168	170	172	183	185	-2	2
Bridgeport, CT	3	194	197	198	194	192	189	197	192	-3	2
Raleigh, NC	3	191	180	184	187	186	200	194	187	-4	2
Phoenix, AZ	3	189	182	187	175	186	187	181	184	-5	2
Dallas, TX	3	179	178	199	203	199	196	177	174	-5	2
Temple, TX	3	175	167	158	164	165	168	168	169	-6	2
Columbia, SC	3	189	200	193	180	184	191	182	182	-7	2
Toledo, OH	3	174	162	162	164	164	172	165	165	-9	2
Evanston, IL	3	197	196	201	200	202	192	182	187	-10	1
Spartanburg, SC	3	187	204	212	205	170	147	168	175	-12	1
Lubbock, TX	3	179	197	217	166	150	159	180	168	-12	1
Melrose Park, IL	3	196	200	195	189	185	182	183	182	-14	1
Hinsdale, IL	3	185	187	186	185	181	174	174	170	-15	1
Cincinnati, OH	3	174	166	161	162	162	163	157	156	-18	1
Davenport, IA	3	174	178	179	182	177	175	161	156	-19	1
Bradenton, FL	3	179	182	191	191	173	194	197	158	-21	1
Philadelphia, PA	3	181	175	175	177	175	170	162	160	-21	1
Cedar Rapids, IA	3	190	176	172	174	173	171	172	167	-23	1
Elgin, IL	3	188	177	182	177	174	180	171	161	-27	1
Baton Rouge, LA	3	182	186	176	171	160	157	154	151	-31	1
Waco, TX	3	183	177	175	180	166	161	161	150	-33	1
Aurora, IL	3	182	185	181	173	172	180	168	148	-35	1
Tupelo, MS	3	199	200	204	193	182	173	168	157	-42	1
Yakima, WA	3	181	201	200	182	173	190	169	139	-42	1
Oxford, MS	3	177	175	186	190	172	166	156	132	-45	1
Beaumont, TX	3	179	149	169	169	153	151	133	123	-56	1

HRR City	2012 qrtile	2012 (%)	2013 (%)	2014 (%)	2015 (%)	2016 (%)	2017 (%)	2018 (%)	2019 (%)	Perc pt. change	Change qrtile
Hattiesburg, MS	3	190	178	172	141	136	122	121	122	-68	1
Corpus Christi, TX	3	188	186	150	149	157	157	133	111	-77	1
Ridgewood, NJ	2	168	165	173	188	204	221	229	226	58	4
Sarasota, FL	2	160	184	212	191	175	216	206	211	51	4
Charleston, WV	2	166	149	168	176	185	198	183	209	44	4
Tampa, FL	2	165	170	189	194	196	209	210	206	41	4
Fort Myers, FL	2	169	168	211	201	197	205	204	210	41	4
El Paso, TX	2	163	162	174	188	200	202	200	199	36	4
Harrisburg, PA	2	160	167	177	184	187	189	191	195	35	4
Charlottesville, VA	2	170	175	174	173	177	169	194	204	34	4
Everett, WA	2	160	172	186	201	204	201	193	191	31	4
Newark, NJ	2	162	155	164	155	163	195	175	191	30	4
Minot, ND	2	163	135	110	121	140	160	185	193	29	4
Atlanta, GA	2	169	168	176	182	190	195	196	192	23	4
Charleston, SC	2	170	168	186	199	199	197	194	192	22	4
Mason City, IA	2	163	158	164	171	172	179	184	185	22	4
Olympia, WA	2	173	173	198	228	205	209	207	195	22	4
Tyler, TX	2	159	169	192	162	134	135	152	180	21	4
Durham, NC	2	161	158	161	166	170	175	178	182	21	4
Tallahassee, FL	2	174	171	176	179	190	191	204	193	20	4
Lansing, MI	2	161	153	153	164	166	169	142	180	19	4
Joliet, IL	2	158	165	163	158	168	180	165	177	19	3
Sun City, AZ	2	162	143	165	169	161	170	193	181	19	3
Shreveport, LA	2	160	161	173	182	182	175	179	178	18	3
Hackensack, NJ	2	172	168	159	172	185	183	182	191	18	3
Danville, PA	2	171	168	170	174	180	184	183	187	17	3
Tulsa, OK	2	166	167	175	180	185	192	186	182	17	3
Bakersfield, CA	2	163	165	175	170	146	148	172	179	16	3
Rome, GA	2	173	182	194	194	195	194	194	189	16	3
Lakeland, FL	2	164	162	169	177	180	190	195	179	15	3
Columbia, MO	2	173	171	176	179	181	185	184	188	15	3
Norfolk, VA	2	168	164	166	161	166	168	180	183	14	3
Pensacola, FL	2	160	153	157	172	174	172	178	174	14	3
Greenville, NC	2	172	168	179	177	185	181	180	185	14	3
St. Louis, MO	2	158	154	162	167	167	172	169	170	12	3
Dubuque, IA	2	171	169	177	182	181	182	184	183	12	3
Palm Springs/Rancho Mira, CA	2	172	168	191	198	190	190	182	183	11	3
Iowa City, IA	2	164	154	159	165	162	163	164	175	11	3

HRR City	2012 qrtile	2012 (%)	2013 (%)	2014 (%)	2015 (%)	2016 (%)	2017 (%)	2018 (%)	2019 (%)	Perc pt. change	Change qrtile
Bismarck, ND	2	163	175	183	196	190	184	179	173	11	3
St. Paul, MN	2	160	160	167	173	181	186	183	170	10	3
Wichita, KS	2	164	165	178	176	171	173	171	170	6	2
Marquette, MI	2	164	179	192	197	188	191	181	169	4	2
Waterloo, IA	2	165	165	165	171	170	68	72	169	3	2
Neenah, WI	2	167	162	167	163	170	168	180	170	3	2
Muskegon, MI	2	160	149	147	144	145	142	145	163	3	2
Houma, LA	2	172	163	172	158	153	157	166	174	2	2
Metairie, LA	2	167	169	176	167	159	158	162	168	2	2
Oklahoma City, OK	2	164	156	180	179	174	174	176	165	1	2
Miami, FL	2	170	163	186	185	176	172	169	171	1	2
Kettering, OH	2	166	169	159	161	160	171	164	166	0	2
Morristown, NJ	2	174	169	157	167	171	167	174	173	-1	2
Savannah, GA	2	171	181	177	184	174	164	145	169	-2	2
Lexington, KY	2	167	157	158	168	169	167	165	164	-3	2
Fort Worth, TX	2	172	178	204	202	197	196	176	168	-4	2
Panama City, FL	2	170	145	153	142	138	174	162	165	-5	2
Hartford, CT	2	160	155	148	159	162	161	153	154	-5	2
Las Vegas, NV	2	160	166	168	173	168	168	169	154	-6	2
Hudson, FL	2	168	170	216	204	175	171	164	162	-7	2
Memphis, TN	2	163	165	173	170	173	175	163	155	-8	2
Monroe, LA	2	172	160	158	169	163	148	165	162	-10	1
Reno, NV	2	160	143	139	143	144	146	147	149	-11	1
Houston, TX	2	161	146	157	166	160	155	151	150	-12	1
Gainesville, FL	2	165	172	173	167	155	155	154	152	-13	1
Des Moines, IA	2	168	158	163	166	167	158	157	154	-14	1
Lafayette, LA	2	171	175	166	178	167	167	151	153	-18	1
St. Cloud, MN	2	165	164	178	171	157	158	157	147	-18	1
Akron, OH	2	166	154	138	152	147	151	150	146	-20	1
Providence, RI	2	167	158	149	146	144	142	139	146	-21	1
Blue Island, IL	2	165	159	159	150	153	160	155	144	-21	1
Macon, GA	2	167	158	161	158	156	146	152	146	-21	1
Traverse City, MI	2	159	146	144	139	137	133	133	137	-22	1
Texarkana, AR	2	172	186	218	230	237	210	143	147	-25	1
Royal Oak, MI	2	161	150	152	138	139	145	142	133	-27	1
Paterson, NJ	2	162	167	178	173	188	196	149	134	-28	1
Springdale, AR	2	169	170	171	162	145	142	135	138	-31	1
Slidell, LA	2	165	160	174	169	166	167	145	128	-36	1

HRR City	2012 qrtile	2012 (%)	2013 (%)	2014 (%)	2015 (%)	2016 (%)	2017 (%)	2018 (%)	2019 (%)	Perc pt. change	Change qrtile
Dothan, AL	2	166	163	162	148	137	132	132	128	-38	1
Jackson, MS	2	164	142	167	154	143	133	122	125	-39	1
Amarillo, TX	1	137	152	154	180	178	198	194	185	48	4
Austin, TX	1	153	149	162	194	216	206	199	199	46	4
St. Petersburg, FL	1	154	161	193	192	180	202	192	196	42	4
Mesa, AZ	1	154	146	151	179	181	176	193	195	41	4
Nashville, TN	1	153	149	162	158	159	172	188	191	39	4
Scranton, PA	1	131	138	156	155	150	154	161	165	34	4
Manhattan, NY	1	126	132	138	142	144	144	149	156	29	4
Johnstown, PA	1	119	109	117	135	135	134	139	146	27	4
Grand Forks, ND	1	142	140	140	147	153	152	165	169	27	4
Sayre, PA	1	156	143	151	162	163	177	179	182	26	4
Kingsport, TN	1	145	142	146	153	154	157	168	171	26	4
Greensboro, NC	1	141	129	145	158	157	160	161	166	25	4
Huntsville, AL	1	110	111	115	117	115	121	124	135	25	4
White Plains, NY	1	147	141	149	155	157	154	152	168	21	4
Fort Lauderdale, FL	1	133	143	149	152	155	155	156	152	19	4
Harlingen, TX	1	114	125	180	161	144	135	144	132	18	4
Binghamton, NY	1	143	147	160	162	172	166	160	160	18	4
Albany, NY	1	148	150	157	158	160	168	161	165	17	4
Rochester, NY	1	127	117	125	135	142	143	147	144	17	4
East Long Island, NY	1	157	157	162	166	174	174	170	175	17	3
Chattanooga, TN	1	132	142	139	131	160	162	159	148	17	3
San Bernardino, CA	1	140	141	144	153	154	153	161	157	16	3
Grand Rapids, MI	1	142	142	144	149	156	156	155	158	16	3
Syracuse, NY	1	124	126	129	138	141	132	138	139	14	3
Baltimore, MD	1	138	134	136	134	141	159	161	150	12	3
Bronx, NY	1	101	121	122	124	113	101	106	112	11	3
Saginaw, MI	1	157	162	167	177	177	173	170	168	11	3
Takoma Park, MD	1	105	102	110	124	116	116	115	116	11	3
Appleton, WI	1	150	150	155	162	157	154	167	161	11	3
Worcester, MA	1	80	77	79	85	93	96	92	91	11	3
Honolulu, HI	1	136	128	140	149	145	146	149	147	10	3
Ann Arbor, MI	1	153	153	156	157	162	164	164	163	10	3
Springfield, MA	1	99	99	103	103	108	147	206	106	8	3
New Orleans, LA	1	116	122	112	101	117	129	129	123	7	3
Louisville, KY	1	156	142	154	157	162	161	159	163	7	3
Elyria, OH	1	124	117	126	134	132	141	136	131	7	3

HRR City	2012 qrtile	2012 (%)	2013 (%)	2014 (%)	2015 (%)	2016 (%)	2017 (%)	2018 (%)	2019 (%)	Perc pt. change	Change qrtile
Pittsburgh, PA	1	124	123	127	127	127	124	127	131	7	3
Washington, DC	1	133	128	131	138	141	144	142	140	6	3
Jonesboro, AR	1	103	106	109	113	118	115	107	109	6	2
Erie, PA	1	135	136	137	136	136	136	139	141	6	2
San Antonio, TX	1	148	151	167	179	165	165	161	154	6	2
Dearborn, MI	1	131	125	126	129	136	125	138	134	3	2
Chicago, IL	1	155	154	154	154	151	152	155	157	2	2
Ocala, FL	1	149	150	155	163	161	158	156	151	2	2
Boston, MA	1	122	120	121	123	129	127	125	123	1	2
Elmira, NY	1	145	134	136	144	149	145	140	145	0	2
Meridian, MS	1	137	131	161	159	166	148	114	137	-1	2
Detroit, MI	1	137	132	140	140	141	148	138	137	-1	2
Augusta, GA	1	138	132	142	141	146	148	150	137	-1	2
Pontiac, MI	1	130	125	124	126	125	128	131	129	-1	2
Bryan, TX	1	155	173	226	191	156	167	164	152	-3	2
Canton, OH	1	140	141	138	109	123	119	144	136	-4	2
Youngstown, OH	1	143	137	135	138	135	143	142	139	-4	2
Wilmington, NC	1	140	130	133	139	146	143	139	136	-4	2
Jackson, TN	1	130	133	143	141	148	152	133	125	-5	2
Wichita Falls, TX	1	154	181	164	140	178	184	158	149	-5	2
Little Rock, AR	1	134	122	124	126	130	129	125	129	-5	2
Petoskey, MI	1	150	150	142	144	146	144	143	145	-5	1
New Haven, CT	1	157	158	154	148	152	146	154	151	-6	1
Tuscaloosa, AL	1	101	96	105	106	108	95	96	95	-7	1
Knoxville, TN	1	147	144	164	160	151	153	147	138	-9	1
Lake Charles, LA	1	144	151	145	146	147	134	130	133	-10	1
Altoona, PA	1	126	128	125	125	125	124	124	115	-11	1
Montgomery, AL	1	119	120	120	126	130	125	119	107	-12	1
McAllen, TX	1	121	159	180	175	182	232	168	109	-12	1
Flint, MI	1	120	113	109	111	110	114	114	107	-13	1
Buffalo, NY	1	113	110	106	113	108	102	103	99	-14	1
Kalamazoo, MI	1	138	130	132	138	131	131	125	124	-15	1
Odessa, TX	1	148	142	150	152	150	155	127	133	-15	1
Columbus, GA	1	153	119	111	113	140	144	140	138	-15	1
Johnson City, TN	1	143	136	133	137	133	134	133	127	-16	1
Birmingham, AL	1	133	126	123	128	119	119	115	116	-17	1
Sioux City, IA	1	154	155	160	156	150	142	143	137	-17	1
Tucson, AZ	1	129	125	127	120	117	121	112	112	-17	1

HRR City	2012 qrtile	2012 (%)	2013 (%)	2014 (%)	2015 (%)	2016 (%)	2017 (%)	2018 (%)	2019 (%)	Perc pt. change	Change qrtile
Fort Smith, AR	1	136	118	149	146	138	133	130	118	-18	1
Mobile, AL	1	145	142	133	129	122	129	127	123	-23	1
Alexandria, LA	1	149	138	140	166	150	131	141	125	-23	1

SOURCE: Authors' analysis of 2012-2019 Healthcare Provider Cost Reporting Information System (HCRIS) data.

NOTES: Price ratio estimates reflect estimated commercial revenue-to-charge ratios divided by Medicare revenue-to-charge ratios. The change quartile reflects the percentage point change quartile from 2012 to 2019 within a given 2012 price ratio quartile .

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