Per Capita Medicare Inflation in the Last Decade: Unit Cost Increases Offset by Reduced Utilization



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D artmouth College has determined that analyses of publicly available data are not considered to be human subjects research (CPHS00028121).

Among the commercially insured, per capita medical expenditure growth has been fueled by unit price inflation. Though attenuated by reduced per capita utilization (2011–2017), unit price inflation has driven overall inflation, being substantially higher for hospital than for physician services (2007–2014). While per capita health care spending growth has been higher for the commercially insured than for those insured by Medicare, evaluation of the relative contributions of utilization and unit price inflation to overall per capita Medicare fee-for-service expenditure inflation has not been conducted. We sought to complete such an analysis.

METHODS

From the Centers for Medicare and Medicaid Services (CMS), we obtained 2007–2017 public use files for Medicare fee-forservice beneficiaries aged less than 65 years old (< 65) and 65 years old and older (65+). Those data included the number of fully enrolled Medicare Parts A & B beneficiaries and standardized care expenditures (that eliminate expenditures for graduate medical education and disproportionate share, locality pay differences, and alternative payment model differentials) disaggregated into 18 service categories.⁴

For each service category, we obtained the number of beneficiaries who used each service and per-beneficiary service-specific utilization rates (for longitudinal services (e.g., inpatient care categories, home health care, and hospice), including the number of days of service use). We estimated the total number of service-specific "events" (e.g., procedures or dialysis visits) for single-use services and service-specific

"episodes" for longitudinal services by multiplying the perbeneficiary number of events or episodes by the number of beneficiaries. We divided those numbers by the service-specific number of users to generate annual per-user service-specific utilization estimates. We calculated the proportionate contribution of each service category to total per capita costs, and we calculated the overall compound annual inflation rate (CAIR) for each service category over the time period examined. Finally, we calculated the relative contributions to overall service-specific CAIRs of the proportion of beneficiaries using the service and the following component contributors: for single-use services, the number of events per service-user and the estimated unit cost per event; for longitudinal services, the number of episodes per service-user, the number of days per episode, and the estimated unit cost per episode day.

RESULTS

For both age groups, per capita costs of care shifted from inpatient, long-term care, home health, procedures, imaging, and durable medical equipment (DME) to inpatient rehabilitation, outpatient hospital, federally qualified health center or rural health center (FQHC/RHC), and ambulatory surgical center care (Table 1). Proportions of both populations using FQHC/RHCs and procedures grew; proportions of the 65+ population using most longitudinal services fell. The annual per-user event number decreased for most longitudinal care services, imaging, DME, and testing but increased for outpatient hospital care, outpatient dialysis, and procedures. Among longitudinal care episodes, the number of days per episode fell while the estimated standardized unit cost per episode day increased.

Increases in every CAIR-contributing component caused overall outpatient hospital, FQHC/RHC, and ambulatory surgical center care CAIRs to be the highest (Fig. 1). Longitudinal services' CAIRs were fueled by higher estimated costs per day but offset by fewer days per episode and a smaller proportion of 65+ beneficiaries using those services. Dialysis, imaging, and DME CAIRs were offset by lower costs per event; per-beneficiary DME CAIRs were further deflated by decreases in the per-user event number and the proportion of the population obtaining services.

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Table 1 For Medicare Fee-for-Service Enrollees Younger than 65 Years Old (Top) and 65 Years Old and Older (Bottom), for 2007 and 2017, Number of Beneficiaries, Total and Service-Specific Standardized Per Capita Costs (and Percentage of Total Costs for the Year), Proportion of the Enrolled Population That Used the Service, the Mean Number of Standardized Cost per Event, and, for Longitudinal Services, the Number of Days per Episode and the Estimated Standardized Cost per Event, and, for Longitudinal Services, the Number of Days per Episode and the Estimated Standardized Cost per Event, and, for Longitudinal Services, the Number of Events per User Was Not Provided by CMS.

Qualified Health Center; RHC Means Rural Health Center. For Part B Drugs, the Number of Events per User Was Not Provided by CMS.

Service category	Standardized per cost (total and %)	Standardized per capita cost (total and %)	g.		Proportion using the service	on using	Annual service events per user	ervice r user	Standardized cost per event	ent ent	Days per episode	<u>_</u>	Estimated standardized cost per episode day	t ized episode
Younger than 65 years old	2007 (N = 5,509,342) Amount	%	2017 (N = 5,341,828) Amount	%	2007	2017	2007	2017	2007	2017	2007	2017	2007	2017
Total	\$8189	č	\$10,968	,	10.00	5		-	000	070	,	-	0	5
Inpatient Tong form one home	\$2890	35.5%	\$3339	32.3%	19.8%	17.9%	1.92	1.90	\$7606	\$10,408	5.3	6.1 26.0	\$1210	\$1524
Long-term care nome	\$1/0	1.1%	\$195 5167	1.8%	0.45%	0.44% 0.11%	1.15	1.14	434,004 614 050	438,732 630,831	10.67	10.0	\$1171 61100	61200
Inpatient renabilitation facility (Villed numeing facility)	\$100 \$207	1.5%	\$10/ \$150	1.3% 1.0%	0.24% 0.20%	0.71% 3.70%	1.10 1.50	1.15 1.48	\$14,939 \$22.40	\$20,821 €11 453	12.0 76.1	C.71	\$1190 \$210	\$1377 \$208
Skilled huising facility Home health	\$333 \$333	5.3% 4 1%	\$375	3.4% 5.0	5.9%	67.7%	2.07	2.40 2.09	\$2752	\$2680	20.1	15.3	\$136	\$350
Hospice	879	1.0%	\$106	1.0%	0.76%	0.94%	1.05	1.07	\$9815	\$10.647	65.6	59.6	\$150	\$172
Outpatient hospital	0968	11.7%	\$1928	17.6%	63.4%	68.1%	7.16	7.96	\$212	\$356			· · · · · · · · · · · · · · · · · · ·	
FQHC or RHC	\$44	0.5%		0.9%	11.8%	17.3%	5.00	4.93	\$75	\$120				
Outpatient dialysis center facility	\$633	7.7%	\$861	7.9%	2.8%	3.4%	110.05	138.94	\$205	\$182				
Ambulatory surgical center	840	0.5%	878	0.7%	5.2%	6.3%	1.73	1.81	\$435	289\$				
Evaluation and management	\$821	10.0%	\$1077	%8.6	83.0%	85.6%	16.34	17.66	\$61	\$71				
Procedures	\$479	5.8%	\$586	5.3%	48.5%	53.9%	7.22	8.08	\$137	\$135				
Imaging	\$238	2.9%		1.6%	59.9%	62.5%	80.9	5.99	\$65	\$47				
Durable medical equipment	\$347	4.2%	\$287	2.6%	28.8%	27.6%	8.11	6.71	\$149	\$155				
Tests	\$221	2.7%	\$308	2.8%	65.5%	70.7%	11.56	10.89	\$29	\$40				
Ambulance	\$150	1.8%	\$189	1.7%	12.1%	13.8%	4.10	3.92	\$304	\$350				
Part B drugs	\$285	3.5%	\$426	3.9%	34.5%	37.6%								
Other services	\$1111	1.4%	\$109	1.0%										
65 years old and older	(N = 27,363,352)	3,352)	(N = 28,38)	(3,995)										
Total	88002	;	\$9534	,		,	;				1	,		
Inpatient	\$2573	32.2%	\$2597	27.2%	20.8%	16.9%	1.61	1.54	\$7705	\$9951	5.5	5.0	\$1409	\$1973
Long-term care home	\$121	1.5%	\$102	1.1%	0.33%	0.25%	1.21	1.19	\$30,328	\$33,845	24.8	23.0	\$1225	\$1472
Inpatient rehabilitation facility	\$172	2.1%	\$229	2.4%	1.1%	1.0%	1.13	1.16	\$14,357	\$19,086	12.7	12.3	\$1133	\$1558
Skilled nursing facility	8/48	9.3%	/xxx	9.0%	5.9%	5.2%	1.40	1.38	\$9010	\$11,907	26.6	25.0	\$339	747
Home health	\$495 \$778	6.2% 5.2%	\$539	5.7% 4.0%	9.4% %5.0	%.c.	1.85	1.84	\$2827	\$29/8	19.7 60.0	16.9	\$143	\$1/\ 6170
nospice Outratiant bosnital	9778	9.3%	6204 61707	15.7%	63 30%	5.2%	5.86	1.04	49911	\$11,049	0.00	4.00	4144	0/10
FOHC or RHC	\$74	0.3%	\$4.8 1	0.5%	6.7%	% × × ×	2.80	435	, \$28 \$75	\$124 242				
Outpatient dialysis center facility	. .	1.5%	\$149	1.6%	0,60%	0.68%	96.81	125.60	\$204	\$174				
Ambulatory surgical center	877	1.0%	\$114	1.2%	10.2%	11.0%	1.74	1.67	\$435	\$621				
Evaluation and management	8790	%6.6	8979	10.3%	91.0%	90.7%	14.48	15.02	860	\$72				
Procedures	\$574	7.2%	699\$	7.0%	64.0%	%9'.29	7.02	8.22	\$128	\$120				
Imaging	\$310	3.9%	\$226	2.4%	72.0%	71.0%	5.87	5.54	\$73	\$57				
Durable medical equipment	\$224	2.8%	\$151	1.6%	28.9%	26.1%	95.9	5.77	\$118	\$100				
Tests	\$233	2.9%	\$266	2.8%	79.7%	80.9%	12.87	11.62	\$23	828				
Ambulance	\$108	1.3%	\$126	1.3%	11.3%	$\frac{11.3\%}{22.9\%}$	3.18	3.14	\$302	\$356				
Part B drugs	\$269	3.4%	\$459	4.8% 9.5.5.	24.8%	57.3%								
	4122	0,7.1	0+1+0	0/.C.1										

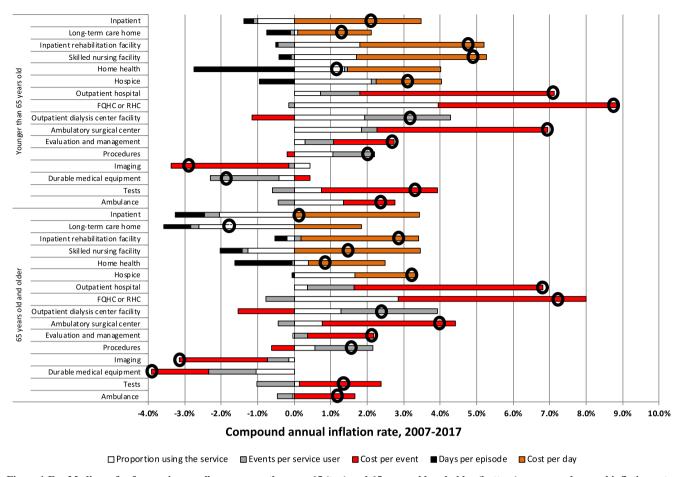


Figure 1 For Medicare fee-for-service enrollees younger than age 65 (top) and 65 years old and older (bottom), compound annual inflation rates for the period 2007–2017 overall for each service (in the black circle) and for each inflation rate component (the proportion of the service population that used the service, the number of events per service, the estimated cost per event (for single-use services), and the number of days per episode and the estimated cost of each episode day (for longitudinal services).

DISCUSSION

We examined per capita utilization, per-service expenditures, and average per-unit cost estimates for a variety of health care services between 2007 and 2017 and found that per capita Medicare fee-for-service expenditures shifted from inpatient to outpatient settings and that perbeneficiary longitudinal care cost inflation was driven by substantial increases in the estimated standardized cost of care per day but mitigated by shorter lengths of service provision and lower per-user service utilization. Dialysis, procedures, and imaging experienced unit cost deflation.

While accountability may have driven care to lower cost settings and reduced waste, we found relatively high unit cost growth in most care services. Although limited by its reliance on administrative data, and an inability to adjust for changing patient needs, these initial findings invite further research examining the effectiveness of efforts to reduce components of per capita Medicare inflation by reducing low-value care provision (reducing service use),⁵ reducing estimated unit costs for longitudinal services (reducing episode costs), or enhancing provider productivity (improving care efficiency).⁶

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REFERENCES

- 2017 and 2013 Health Care Cost and Utilization Reports. http://www.healthcostinstitute.org/research/annual-reports/entry/2017-health-care-cost-and-utilization-report and http://www.healthcostinstitute.org/images/pdfs/2013-HCCUR-12-17-14.pdf: Health Care Cost Institute; 2019 & 2014.
- Cooper Z, Craig S, Gaynor M, Harish NJ, Krumholz HM, Van Reenen J. Hospital Prices Grew Substantially Faster Than Physician Prices For Hospital-Based Care In 2007-14. Health Affairs (Project Hope) 2019:38:184-9
- Frost A, Barrette E, Kennedy K, Brennan N. Health Care Spending Under Employer-Sponsored Insurance: A 10-Year Retrospective. Health Affairs (Project Hope) 2018;37:1623-31.
- Centers for Medicare & Medicaid Services Public Use file. http://www.cms. gov/research-statistics-data-and-systems/statistics-trends-and-reports/ medicare-geographic-variation/gv_puf.html. Centers for Medicare & Medicaid Services; 2019.
- Schwartz AL, Jena AB, Zaslavsky AM, McWilliams JM. Analysis of Physician Variation in Provision of Low-Value Services. JAMA Intern Med 2019;179:16-25.
- Skinner J, Chandra A. Health Care Employment Growth and the Future of US Cost Containment. Jama 2018;319:1861-2.

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