A Decade of Modest Convergence in Geographic Variation in Per Capita Medicare Fee-for-Service Expenditures: Taxation Without Representation Is Not Sustainable; Is It Time for Taxpayer and Consumer Engagement?

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A Decade of Modest Convergence in Geographic Variation in Per Capita Medicare Fee-for-Service Expenditures: Taxation Without Representation Is Not Sustainable; Is It Time for Taxpayer and Consumer Engagement?

William B. Weeks, MD, PhD, MBA[1] [ORCID], *Grace H. Huynh, MD, PhD[1], and James N. Weinstein, DO, MS[1,2,3,4]*

[1]Microsoft Research, Microsoft Corporation, Redmond, WA, USA; [2]The Dartmouth Institute, Lebanon, NH, USA; [3]Kellogg Business School, Evanston, IL, USA; [4]Tuck Business School, Hanover, NH, USA.

W asteful healthcare spending persists[1] but is concentrated and amenable to change: Hospital Referral Regions (HRRs) with higher per capita expenditures provide more low-value care,[2] and more wasteful Accountable Care Organizations reduce low-value care use after entering value-based payment plans.[3] We hypothesized that increasing adoption of value-based payment models—introduced by the Centers for Medicare and Medicaid Services (CMS) in 2010 and designed to reduce waste—might reduce geographic variation in per capita healthcare spending and slow per capita expenditure growth in higher spending areas. To explore this hypothesis, we examined recent CMS data.

METHODS

From CMS, for 2007–2017, at the HRR level, we obtained fee-for-service beneficiaries' Part A and B standardized per capita expenditures (eliminating expenditures for graduate medical education and disproportionate share, locality pay, and alternative payment model differentials) disaggregated into 16 service categories listed in the Table 1 (data obtained at http://www.cms.gov/research-statistics-data-and-systems/statistics-trends-and-reports/medicare-geographic-variation/gv_puf.html).

We grouped per capita service-specific expenditures into "episodic" (like inpatient and home health care) and "service" (like procedures and evaluation and management (E&M) visits) care categories; "total" per capita expenditures are their sum. To determine whether geographic variation in per capita total, episodic, and service care expenditures converged between 2007 and 2017, we calculated 3 commonly used measures of geographic variation,[4] described in the Figure 1 legend.

We categorized HRRs into quintiles of total per capita expenditures in 2007 and calculated service-specific compound annual inflation rates (CAIRs) in the periods 2007–2010 (before value-based payment plans), 2010–2014 (early implementation), and 2014–2017 (late implementation).

RESULTS

Between 2007 and 2017, while all 3 measures of geographic variation in expenditures on episodic and service care fell slightly, only the extreme ratio for episodic care fell substantially (Fig. 1).

In 2007, per capita expenditures on every service category except outpatient hospital care increased when moving from lower to higher total spending quintiles (Table 1). Between 2007 and 2010, CAIRs did not exhibit any patterns across 2007-defined total spending quintiles, though CAIRs were generally high. Between 2010 and 2014, CAIRs were substantially lower (and negative) for many episodic care categories, procedures, testing, imaging, and durable medical equipment (DME). Between 2014 and 2017, growth accelerated in all categories save skilled nursing facilities, long-term care hospitals, E&M, DME, and ambulance care; further, overall, episodic, and outpatient hospital care per capita growths were highest for 2007's lowest spending quintile and lowest for 2007's highest spending quintile. The lowest and highest

Table 1 For Hospital Referral Region Defined Quintiles of Per Capita Fee-for-Service Medicare Expenditures in 2007: Per Capita Expenditures on Total, Episodic Care, and Service Care and Their Components in 2007 (left), and Compound Annual Inflation Rates for 2007–2010, 2010–2014, and 2014–2017 (right). Italics Indicates Negative Values

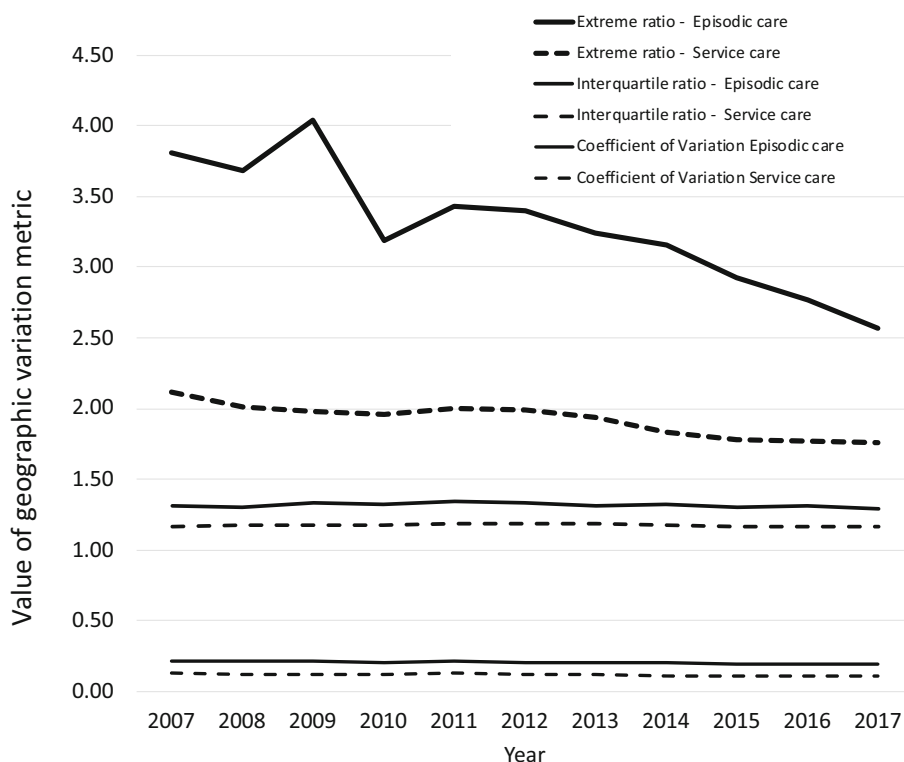| | Per capita fee-for-service Medicare expenditures in 2007 (2007 total per capita expenditure quintile) | | | | | Compound annual inflation rates for the period: | | | | | | | | | | | | | | |
| | | | | | | 2007–2010 (2007 total per capita expenditure quintile %) | | | | | 2010–2014 (2007 total per capita expenditure quintile %) | | | | | 2014–2017 (2007 total per capita expenditure quintile %) | | | | |
	Lo	2	3	4	Hi	Lo	2	3	4	Hi	Lo	2	3	4	Hi	Lo	2	3	4	Hi
Total	$6161	$6943	$7595	$8203	$9438	4.7	4.5	4.3	4.5	4.5	0.4	0.5	0.5	0.0	−0.3	2.7	2.4	2.2	2.0	1.3
Episodic care categories	$3176	$3697	$4078	$4491	$5353	4.2	3.9	4.0	4.1	4.3	−1.0	−0.8	−0.8	−1.4	−1.3	1.7	1.0	0.9	0.9	0.0
Acute Inpatient	$2138	$2393	$2555	$2779	$2985	3.2	2.3	2.3	2.5	2.6	−1.8	−1.5	−1.4	−2.2	−2.0	2.2	1.6	1.6	1.5	1.3
Skilled nursing facility	$542	$607	$655	$736	$741	6.7	6.7	7.1	6.9	8.0	−0.4	−0.3	0.2	−0.3	1.0	−1.3	−2.1	−1.8	−1.5	−0.7
Home health	$217	$279	$354	$428	$868	5.2	8.1	9.2	9.5	6.6	0.3	−0.2	−2.1	−2.0	−4.4	3.5	2.0	2.1	1.2	−3.6
Hospice	$168	$222	$256	$254	$282	5.7	6.0	6.2	6.0	5.7	3.6	0.8	2.0	0.7	2.9	4.9	3.7	2.0	3.2	2.7
Inpatient rehabilitation facility	$82	$143	$152	$175	$212	1.9	3.7	0.4	2.4	3.1	1.8	4.5	3.5	3.5	3.9	0.4	3.1	4.3	3.3	3.9
Long-term care hospital	$29	$54	$106	$119	$265	18.1	9.6	5.0	3.4	5.1	1.8	0.9	0.7	−1.0	−0.4	−7.3	−7.4	−7.9	−5.8	−8.7
Service care categories	$2985	$3246	$3518	$3712	$4085	5.1	5.1	4.7	5.0	4.7	1.7	1.9	1.9	1.6	1.1	3.6	3.7	3.4	3.2	2.8
Outpatient hospital	$867	$818	$842	$770	$755	9.5	9.3	8.7	9.7	10.2	4.8	5.1	5.5	6.0	5.8	6.9	6.4	6.4	5.9	5.7
Evaluation and management	$583	$674	$733	$874	$966	4.2	4.6	4.5	4.8	4.8	1.7	2.2	2.2	1.6	1.1	0.4	1.0	1.0	1.0	0.8
Procedures	$458	$503	$537	$591	$638	3.9	4.3	3.9	4.5	4.2	−1.3	−0.7	−0.5	−1.1	−1.4	2.5	2.8	2.9	2.7	2.9
Part B drugs	$212	$258	$276	$278	$308	3.4	4.2	3.6	3.4	3.1	3.8	5.3	3.3	4.7	3.3	7.9	9.0	9.5	9.2	8.1
Dialysis	$148	$164	$197	$192	$272	4.5	3.6	3.3	3.8	3.8	3.2	3.3	3.5	3.2	3.7	0.4	0.7	0.4	0.4	0.3
Testing	$158	$187	$220	$251	$288	4.4	5.2	6.5	6.5	6.0	−3.6	−2.3	−1.2	−1.5	−2.1	3.4	4.3	2.0	2.6	2.1
Imaging	$207	$245	$275	$331	$369	−2.5	−2.8	−3.7	−3.2	−3.1	−5.2	−4.6	−5.1	−5.5	−5.8	0.3	0.9	0.4	0.4	0.1
Durable medical equipment	$206	$234	$260	$227	$276	0.8	0.9	1.0	1.7	−1.2	−3.6	−3.7	−4.2	−4.5	−6.0	−7.4	−6.3	−5.7	−4.9	−4.6
Ambulance	$83	$103	$111	$121	$132	5.9	6.4	7.0	7.4	8.3	1.9	0.5	1.6	1.0	−0.1	0.4	−1.8	−1.0	−2.4	−3.3
Ambulatory surgical center	$62	$62	$68	$76	$81	5.2	6.4	6.3	4.1	3.3	1.7	2.2	3.2	1.8	1.3	6.7	8.3	7.5	5.6	7.5

Figure 1 For 2007 to 2017, measures of geographic variation in per capita Medicare fee-for-service standardized expenditures on episodic (filled line) and service (dotted line) care. The measures are the extreme ratio (the highest divided by lowest value), the interquartile ratio (the 75th percentile divided by the 25th percentile value), and the coefficient of variation (the mean divided by the standard deviation).

spending quintiles in 2007 retained those designations in 2017 (data not shown).

DISCUSSION

Between 2007 and 2017, geographic variation in per capita fee-for-service Medicare expenditures modestly converged for episodic care facilitated by slightly higher episodic care CAIRs in low spending regions, particularly after 2014. For many care categories, cost growth dropped during early value-based payment implementation, then increased. While testing, and imaging demonstrated low (or negative) growth rates—perhaps indicating some waste reduction—low absolute values of their per capita costs value limited their overall cost-growth impact.

While our analysis was observational, used standardized expenditure data that could not account for changes in demand or pricing, and could not specifically identify low-value service, it suggests that overall service consumption patterns have not dramatically changed. It is encouraging that extreme ratios for episodic care are falling; however, it is discouraging that growth reductions in 2010–2014 have not continued (though growth remains lower than before value-based payments were introduced).

Nonetheless, should the per capita expenditure CAIRs that we calculated persist, per capita spending in the highest and lowest spending quintiles will not equalize

until 2075. The Medicare Trust Fund is anticipated to become depleted in 2026; after that, Medicare Trustees have proposed increasing the Medicare Tax to 3.81% or immediately reducing expenditures by 19%.[5] Neither seems plausible, and the incremental spending changes that we found will not address the problem.

Heretofore, efforts to engage providers in reducing per capita expenditure growth have had little impact on reducing unnecessary services, like avoidable hospitalization.[6] Perhaps engaging taxpayers and healthcare consumers would facilitate a more rapid waste reduction and expenditure convergence. Making transparent the persistent indirect taxation of those living in low-spending regions by those living in high-spending ones might be motivating to them: should new local tax receipts be required to fill gaps between a national per capita Medicare subsidy and local per capita Medicare spending, politicians and patients might align to reduce wasteful spending, converge spending across geographic settings, and lower Medicare per capita cost growth.

Corresponding Author: *William B. Weeks, MD, PhD, MBA; Microsoft Research Microsoft Corporation, Redmond, WA, USA (e-mail: wiweeks@microsoft.com).*

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