Health spending expenditures for commercial plans are predominantly concentrated among a small population of high-intensity consumers across settings of care

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What is already known about this subject

- As US health care expenditures continue to rise, there is growing policy momentum aimed at managing health care spending.
- Numerous studies have found that annual US health care expenditures are predominantly concentrated among a small population of high-intensity consumers of health care resources.

What this study adds

- This study explores how health spending is distributed across consumers and how utilization and spending patterns compare across health care resource expenditures (eg, hospital services, prescription drugs, or outpatient care).
- Our analysis of a large commercially insured population found that spending was concentrated within a small population of high-intensity consumers across all examined segments of care, including prescription drugs, inpatient care, and ambulatory care.
- Spending patterns across segments of care indicate that curbing rising health care spending will require systemwide evaluation of the value of health spending within and across settings of care for a subset of high-resource-use patients.

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ABSTRACT

BACKGROUND: Rising health care spending has sparked new efforts to constrain health care expenditures.

OBJECTIVE: To explore how health care spending is distributed across consumers and how utilization patterns compare across health care resource expenditures (eg, hospital, outpatient care).

METHODS: Using the IQVIA PharMetrics Plus database, we conducted a retrospective

claims analysis for the 2018 plan year to examine commercial health care spending and utilization across 5 settings of care: ambulatory services, inpatient services, office visits, pharmacy services, and additional services.

RESULTS: Consistent with findings from previous analyses of total health spending, total health care spending for a large commercially insured population was largely concentrated within a small population of high-intensity consumers. These patterns

persist when looking at individual segments of spending, including spending on prescription drugs and inpatient and ambulatory services. Inpatient spending was the most concentrated, with 97% of spending occurring within the top tenth percentile of patients.

CONCLUSIONS: Our findings suggest that health care spending for commercial plans is predominantly concentrated within a small population of high-intensity consumers across all settings of care. Curbing rising health care spending will require systemwide

evaluation of the value of spending within and across settings of care for a subset of high-resource-use patients. This is particularly important for health care settings with the highest concentration of spending, including inpatient care.

For decades, average annual growth in health spending has outpaced average annual growth in the US gross domestic product (GDP), causing overall health spending to assume an increasingly growing share of the US GDP, rising from 5% of GDP in 1960 to 17.7% in 2019.¹ At the same time, numerous studies have shown that annual US health care expenditures are predominantly concentrated within a small group of high-intensity health care consumers.^{2,3} For example, in 2017, the United States spent 17.9% of GDP on health care,⁴ but the top 5% of health care consumers accounted for over 50% of overall health care expenditures.⁵

As annual health care expenditures continue to rise, curbing health care spending has become a key policy priority, as rising health care spending has significant implications for state and federal budgets. Recently, health care decision makers have identified several potential drivers of rising health care expenditures, including hospital consolidation, a high prevalence of chronic disease, and higher prices.⁶⁻⁸

However, little is known about how health care spending is distributed across consumers or how utilization patterns compare across health care resource expenditures (eg, hospital, outpatient care). Given that the majority of annual national health expenditures are concentrated in a small percentage of the population, it is important to examine and compare spending across the health care

TABLE 1 Summary of Patient Spend for the 2018 Plan Year

Percentile of population	Number of patients	Commercial total spend	Commercial total spend adjusted for rebates	Percentage of total spend
Top 1	179,354	27,324,670,196	26,457,471,658	27.6
Top 5	925,896	54,950,367,995	53,019,437,553	55.3
Top 10	1,863,066	68,916,537,106	66,555,019,042	69.4
Top 15	2,794,714	76,913,222,638	74,282,416,326	77.5
Top 20	3,721,310	82,215,714,584	79,404,414,168	82.8
Top 25	4,645,790	86,043,777,298	83,110,231,856	86.7
Top 50	9,214,631	95,512,418,173	92,307,054,045	96.0
100	16,872,732	99,144,803,318	95,854,675,187	100.0

Note: We applied a 15% rebate to pharmacy spend based on a Pew Charitable Trusts analysis of retail pharmaceutical spending, rebates, and coupons across payer types for the 2016 plan year.⁹ This rebate was applied uniformly across percentiles.

system to identify areas of irregular or high-magnitude spend. Findings from such analyses can provide important context when developing public policies aimed at managing rising health care spending. Therefore, this analysis examined commercial health care spending across 5 settings of care (ambulatory services, inpatient services, office visits, pharmacy services, and additional services) to identify utilization and spending patterns across multiple sectors of the US health care system.

Methods

We conducted a retrospective claims analysis for the 2018 plan year (January 2018–December 2018) using the IQVIA PharMetrics Plus database, which contains adjudicated commercial health insurance claims. The PharMetrics Plus database predominantly includes enrollees of employer-sponsored health plans but also includes a small number of individuals covered by Medicare Advantage, supplemental Medicare, and Medicaid. The database is representative of the commercially insured population under the age of 65

years in the United States, reflecting approximately 18% of commercially covered lives across census regions. Additionally, the PharMetrics Plus database includes robust cost, utilization, and enrollment information; is linkable to other real-world data assets; and allows for visibility across all settings of care. However, the database only contains health plan data and only captures health care experiences paid for by the plan. Therefore, items that are not covered by the plan do not appear in the data (eg, low-cost generics paid for by cash, cosmetic surgery).

This analysis included 16,872,732 patients who were continuously enrolled for the 2018 plan year. Spending and utilization were assessed across 5 settings of care: ambulatory services (outpatient hospitals, ambulatory surgical centers, and urgent care centers), inpatient services (inpatient hospitals, psychiatric facilities, and rehabilitation facilities), office visits (physician office or clinic and either individual or group practice), pharmacy services (retail, mail, and specialty pharmacies), and additional services (includes all other types of service not categorized elsewhere

TABLE 2 Total Spending by Category of Spending

Health spending segment	Percentage of total spend for the 2018 plan year	Percentage of total spend when adjusted for rebates	Gini coefficient
Drug ^a	28.5	26.1	0.80883
Ambulatory ^b	26.4	27.3	0.826038
Inpatient ^c	19.1	19.7	0.973767
Office ^d	18.4	19.1	0.49038
Additional services ^e	7.5	7.8	0.832787

^aClaims from pharmacy services (retail, mail, and specialty pharmacies) and the sum of prescription drug spending from the ambulatory, office, pharmacy, and additional services settings of care. Due to database limitations, this segment excludes prescription drugs administered during inpatient stays but does include drugs administered in outpatient settings.

^bService claims from outpatient hospitals, ambulatory surgical centers, and urgent care centers.

^cClaims from inpatient hospitals, psychiatric facilities, and rehab facilities.

^dClaims from physician offices or clinics, either individual or group practice.

^eIncludes all other types of service not categorized elsewhere such as laboratory, home health, nursing facilities, and emergency department.

such as laboratory, home health, nursing facilities, and emergency department).

Because spending on prescription drugs occurs in multiple settings of care, we defined “drug spending” as the sum of prescription drug spending from the ambulatory, office, pharmacy, and additional services settings of care. Due to database limitations, our calculation of drug spending excludes prescription drugs administered during inpatient stays but does include drugs administered in outpatient settings. Claims were categorized into 5 spending segments: inpatient, drug spend, ambulatory, office, and additional services.

Spending concentration was analyzed by calculating the Gini coefficient and examining population percentiles. To form percentile groups, all patients in the sample were rank-ordered from highest to lowest by their 2018 expenditures and assigned a percentile group based on their rank-order position.

To explore how health care resources are distributed across and within settings of care and spending segments, we evaluated the following commercial spending metrics: (1) overall spending concentration for all patients in the 2018 plan year as measured by Gini coefficient and percentile distribution; (2) overall spending concentration by spending segment as measured by Gini coefficient and percentile distribution; (3) total spending per patient by spending segment; (4) average total spending per patient by setting of

care and percentile range; and (5) utilization in each spending segment (as measured by patient count).

To ensure the analysis reflected realistic marketplace conditions, we conducted sensitivity analyses by applying rebates to pharmacy spend. Where indicated, we applied a 15% rebate to pharmacy spend based on a Pew Charitable Trusts analysis of retail pharmaceutical spending, rebates, and coupons across payer types for the 2016 plan year.⁹ This rebate was applied uniformly across percentiles.

Results

First, we examined the overall spending patterns for all patients who were continuously enrolled in a health plan in the 2018 plan year (Table 1). We found that the top 1% of patients accounted for nearly 28% of spending, while the top 5% accounted for more than 55% of spending. We then examined how overall spending was allocated among segments of care and conducted a sensitivity analysis adjusting drug spend for rebates to reflect current market conditions (Table 2).

Drug spending was the largest contributor to overall health care spending in our sampled population of commercially insured enrollees. Of the total health care expenditures (\$99,144,803,318), 28.5% (\$28,283,041,800) of spending was attributed to prescription drug spending across all settings of care, followed by ambulatory spending (26.4%) and inpatient spending (19.1%). However, when drug spending was adjusted for rebates, prescription drug spending shrank to 26.1% and ambulatory spending became the largest share of spending (27.3%).

Second, we calculated the Gini coefficient for total spending and by spending segment (Table 2). A 0 Gini coefficient indicates spending is equally distributed across commercial plan members, while a 1 coefficient indicates that spending is concentrated in a very narrow set of plan members. We calculated a 0.757656 Gini coefficient for total spending, indicating significant spending concentration. Ambulatory, drug, and additional spending coefficient values were similar to total spending, with values ranging between 0.80883 and 0.832787. Inpatient spending was significantly more concentrated, with a 0.973767 coefficient. In contrast, office spending was significantly more dispersed, with a coefficient at 0.49038.

Third, we explored overall spending by population percentile and spending segment (Figure 1). We found that the inpatient and office visit spending categories deviated most from the mean spending curve. For example, inpatient spending was the most concentrated of all segments, with nearly 50% of inpatient spend occurring in the top 1% of spenders, 85% occurring within the top 5%, and 97%

FIGURE 1 Percentage of Total Spend by Segment and Percentile

Notes: Drug spend is the sum of prescription drug spending across pharmacy, ambulatory, office, and additional services spend. Ambulatory spending excludes drug spending (eg, physician-administered drugs) and has been removed from the ambulatory setting.

occurring in the top 10%. Drug spending was the second most concentrated, with 33.5% of total spending occurring in the top 1% of spenders and 63.7% occurring in the top 5% of spenders. Ambulatory and additional services spending followed a similar pattern, with 50.8% and 47.9% of total spending occurring in the top 5% of spenders, respectively. Office spending was the least concentrated, with the biggest change in spending occurring between the 25.01 and 50 percentiles (63.4%-87.8%).

Fourth, we examined average spending per patient by setting of care (Figure 2). Overall, the average total spending per patient across all segments of care among patients in the top 1% of spending was \$152,350. Conversely, average spending per patient in the bottom 50% was \$474. Total average spending per patient dropped 80% between the top 1% and 1.01% to 5% range (\$152,350-\$29,837), indicating that the preponderance of spending occurs among the top 1% of patients.

When examining the 5 health spending segments, we found that average spending was highest in the inpatient spending category on a per-patient basis for the top 15% of spenders. Per-patient spending was second highest in the drug spending category among the top 1% of health

care spenders (\$52,831 per patient) but closer to other spending segments as the population percentiles increased. Ambulatory spending per patient was second highest (slightly higher than drug spend) for the 1.01% to 5% range (\$11,509 per patient) but followed the mean thereafter. However, ambulatory spending per patient exceeded drug spend per patient in the 1.01% to 25% range when prescription drug rebates were considered.

Fifth, we examined the number of unique patients accessing each setting of care to get a better sense of how utilization varied among spending percentiles and across spending segments (Table 3). There were 179,354 unique patients in the top 1 percentile. Over 99% of patients had at least 1 prescription drug claim ($n=179,120$), 98% had at least 1 office visit ($n=176,344$), and 61% had at least 1 inpatient claim ($n=108,833$). Utilization diverged across spending segments as population percentiles increased. Utilization patterns remained similar (ie, highest for prescription drugs and office visits), for which utilization by unique patients was 94% and 97%, respectively, even in the 25.01-50 percentile.

FIGURE 2 Average Total Spend per Person by Setting of Care and Range

Notes: The primary y-axis represents the average spend per patient with a claim in a setting of care. The secondary y-axis is the average spend per patient within a range. For example, there are 179,354 unique patients in the top 1%. However, only 108,833 have an inpatient stay. The inpatient spend in the top 1% is calculated as the total inpatient spend divided by 108,833, while the top 1% total spend is the total spend divided by 179,354. Therefore, the bar will not sum to the line, as the denominators are different.

Discussion

We evaluated health care expenditures in a commercial population to compare utilization and spending patterns across segments and settings of care. We found that the top 5% of sampled individuals ranked by their total health care expenditures were responsible for 55.3% of total spending. These findings are consistent with previous analyses that have found substantial spending concentration among a small percentage of the overall patient population (ie, “frequent fliers”).^{2,4,5} Previous analyses have found that high-resource-use patients are typically older individuals who suffer from multiple chronic physical and mental health conditions^{2,11}; however, additional research is needed to improve understanding of this population and the contextual factors driving their health care utilization.

When examining spending by health care segment, we found that spending concentration, as measured by Gini coefficient and percentile distribution, was generally consistent across the ambulatory, drug, and additional

spending segments across all examined metrics. Spending on office visits was less concentrated than all other areas of spend. Inpatient spending, which involves the most intensive setting of care, had the highest per-patient expenditures in the top population percentiles, and spending was significantly more concentrated as measured by the Gini coefficient. Drug spending was the second largest driver of spending in the top percentiles; however, drug spending was less concentrated than inpatient spending (33.5% vs 49.2%, respectively, in the top 1 percentile). Additional research is needed to further determine the characteristics of high-resource-use patients. Further exploration of this population may foster better care delivery and more efficacious health care interventions (eg, more accurate diagnoses, medications, and treatments will help lead to advanced identification and more suitable treatment).

Spending per patient declined significantly across all spending segments as the population percentiles increased. Per-patient inpatient spending exceeded prescription drug spending in the top 50% of patients when spending was adjusted for rebates. Drug and ambulatory care utilization

TABLE 3 Utilization and Spend per Population Percentile, by Spending Segment

	Utilization by population percentile													
	Top 1%		Top 1.01%-5%		Top 5.01%-10%		Top 10.01%-15%		Top 15.01%-20%		Top 20.01%-25%		Top 25.01%-50%	
Spending segment	Unique patients	%	Unique patients	%	Unique patients	%	Unique patients	%	Unique patients	%	Unique patients	%	Unique patients	%
Inpatient	108,833	60.70	346,563	46.40	269,381	28.70	103,314	11.10	39,568	4.30	21,321	2.30	39,854	0.90
Drugs	179,120	99.90	744,971	99.80	931,543	99.40	918,502	98.60	904,640	97.60	893,488	96.60	4,284,105	93.80
Ambulatory	169,723	94.60	673,279	90.20	819,062	87.40	781,921	83.90	728,301	78.60	680,307	73.60	2,666,820	58.40
Office	176,344	98.30	734,898	98.40	921,036	98.30	912,839	98.00	904,369	97.60	899,749	97.30	4,413,475	96.60
Additional services	149,329	83.30	585,360	78.40	689,824	73.60	615,906	66.10	565,622	61.00	531,577	57.50	2,183,890	47.80
Total unique patients	179,354		746,542		937,170		931,648		926,596		924,480		4,568,841	
Spending segment	Spend per segment, by population percentile													
	Top 1%		Top 1.01%-5%		Top 5.01%-10%		Top 10.01%-15%		Top 15.01%-20%		Top 20.01%-25%		Top 25.01%-50%	
Inpatient	9,313,032,054.26		6,840,766,517.24		2,219,057,840.48		423,531,260.12		77,129,418.25		25,065,451.97		26,368,074.36	
Drugs	9,463,079,523.98		8,554,404,048.66		3,178,968,114.47		1,955,534,172.17		1,312,432,191.59		905,962,101.18		2,146,773,892.08	
Ambulatory	5,541,162,334.75		7,749,095,783.76		4,880,240,647.73		2,794,313,407.70		1,674,766,824.66		1,084,127,088.39		2,014,913,933.08	
Office	1,221,279,582.83		2,684,351,251.95		2,457,795,491.64		2,071,737,381.26		1,717,224,179.42		1,435,311,966.82		4,456,713,977.29	
Additional services	1,786,116,700.42		1,797,080,196.83		1,230,107,016.67		751,569,310.93		520,939,331.93		377,596,105.81		823,870,998.65	
Total spend per population percentile	27,324,670,196		27,625,697,798		13,966,169,110		7,996,685,532		5,302,491,945		3,828,062,714		9,468,640,875	
Spending segment	Average per patient spending, by population percentile													
	Top 1%		Top 1.01%-5%		Top 5.01%-10%		Top 10.01%-15%		Top 15.01%-20%		Top 20.01%-25%		Top 25.01%-50%	
Inpatient	85,571.77		19,738.88		8,237.62		4,099.46		1,949.29		1,175.62		661.62	
Drugs	52,830.95		11,482.87		3,412.58		2,129.05		1,450.78		1,013.96		501.10	
Ambulatory	32,648.27		11,509.49		5,958.33		3,573.65		2,299.55		1,593.59		755.55	
Office	6,925.55		3,652.69		2,668.51		2,269.55		1,898.81		1,595.24		1,009.80	
Additional services	11,960.95		3,070.04		1,783.22		1,220.27		921.00		710.33		377.25	

Note: Spending included in this table for the prescription drug spending segment is not adjusted for rebates.

were widespread across commercial membership based on unique patient utilization numbers. However, ambulatory spending was the biggest overall cost contributor when prescription drug rebates were considered.

Utilization varied substantially by spending segment and population percentile. Utilization in the top 1 percentile ranged from 99.9% in the prescription drug spending segment to 60.7% in the inpatient spending segment, but utilization diverged as population percentiles increased. While the inpatient setting had the highest per-patient spending, very few patients above the 15th percentile had

an inpatient claim. This indicates that a smaller group of patients are contributing to higher inpatient spend relative to other settings of care.

Our findings have 2 main policy implications. First, spending by segment and setting of care for a commercial plan population is consistent with a health system in which the sickest patients will consume the greatest number of resources. As a result, policies that aim to arbitrarily reduce high spending concentration via utilization incentives (eg, health plans with high cost-sharing) or health care price restrictions (eg, caps on specialty drug prices) lack

requisite nuance and may unintentionally limit patient access to needed, high-value treatments without appropriate understanding, intervention, and resolution of patients' health care needs. Rather, health care payers and policies should focus on appropriate use of care and examine frequent flier patients more closely for proactive identification and optimized care.

Second, a significant portion of health care spending is concentrated in a small population. Therefore, managing rising health spending requires that health care decision makers evaluate the value of care delivered to this subset of patients.

LIMITATIONS

Our analysis has 3 main limitations. First, this analysis examines 1 year of utilization and spending in a commercially insured population and cannot speak to how the concentration of spending has changed over time. Given the significant concentration of patient spending in the top 10% of spenders, long-term trends are unlikely to change our conclusion that drug spending is consistent with overall spending. Moreover, our analysis is consistent with several cross-sectional analyses of health spending concentration published by the Agency for Healthcare Research and Quality.^{2,10}

Second, our calculations that adjusted for prescription drug rebates relied on a Pew Charitable Trusts' estimate that we applied uniformly. Rebates are more common in drug classes with higher spending and competition, and the distribution of rebates across overall prescription drug spending is unknown. However, we used a conservative commercial rebate estimate of 15%, which implies that the impact of this is minimal.

Third, this analysis exclusively examines spending within the commercially insured population and

predominantly includes enrollees of employer-sponsored health plans under the age of 65, a population that has lower inpatient stays compared with the general population, including Medicare and Medicaid.^{12,13} As a result, our analysis of the commercial market finds a higher proportion of drug spending of total spending than is present in the general population.¹⁴

Conclusions

Commercial health plan spending is largely concentrated within a small population of high-intensity consumers of health care. This pattern persists when examining spending in individual health care segments, including inpatient services, ambulatory services, and prescription drugs. Inpatient spending was revealed to be the most concentrated of all evaluated spending segments. Curbing rising health care spending will require systemwide evaluation of the value of spending within and across settings of care for a subset of high-resource-use patients.

DISCLOSURES

This study was funded by the National Pharmaceutical Council (NPC). Ciarametaro, Buelt, and Dubois are employed by the NPC. Kleinrock and Campbell are employed by IQVIA, which was contracted by the NPC for data analysis.

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