

Factors Associated With Persistent High Health Care Utilization in Managed Medicaid

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Health care spending in the United States has been accelerating over the past decade, with Medicaid contributing to a significant portion.¹ In 2018, Medicaid represented 16% of total health care spending in the United States, more than half of which was attributable to Medicaid managed care plans.¹ Coordinated supportive health care services have been shown to reduce use of inpatient hospital resources among Medicaid enrollees, suggesting that these patients have otherwise unmet health needs due to lack of coordination of care.² However, Medicaid spending continues to grow despite increasing enrollment of Medicaid enrollees into comprehensive managed care plans.³ Individuals with serious mental illness (SMI) may benefit from this shift into managed care organizations following the passage of the Affordable Care Act.⁴

Lack of mental health integration may be a critical barrier to optimizing health care quality and containing spending among Medicaid managed care enrollees with mental illness.⁵ The lack of coordination between primary care and behavioral health services, exacerbated by carve-outs (contracted agreements with special care providers) of funding for mental health care, can result in missed opportunities and suboptimal treatment strategies.⁵ On average, Medicaid spending is 4 times higher for enrollees with SMI compared with spending for individuals without it.⁴ The highest Medicaid utilizers (“high utilizers”) are those who account for the top 5% of expenditures in any given year and are more likely to have SMI and chronic conditions such as major depression, schizophrenia, and bipolar disorder.⁶⁻⁸

Initial observational studies of intensive case management for high utilizers have shown benefits, but these benefits disappear when studied in randomized controlled trials.⁹ This lack of effectiveness may be explained by the temporal variability in utilization. As a consequence, for most Medicaid enrollees, prior periods of excessive utilization may be a poor predictor of high utilization in subsequent years.⁶⁻⁸ In addition, population-wide care for this vulnerable population is rarely focused on specific medical conditions.⁹ Identifying vulnerable Medicaid enrollees who are at risk of persistent high health care utilization after

ABSTRACT

OBJECTIVES: Prior studies have had difficulty predicting which patients will have persistent high utilization past 1 year within the Medicaid population. The objective of this study was to examine the medical diagnoses at the time of enrollment of patients with persistent high health care utilization over 24 months following enrollment in Medicaid managed care in a large integrated care setting.

STUDY DESIGN: Retrospective cohort study in a large integrated managed health care system.

METHODS: We identified a cohort of high utilizers (top 5% of health care costs in 2014) and extracted their electronic health record data (2014-2016). Differences in baseline characteristics of high utilizers and the general Medicaid population were determined using bivariate analysis. We used multivariable regression to determine the independent association between medical comorbidities and demographics with persistent high health care utilization over the 2 years following enrollment.

RESULTS: Compared with the general Medicaid managed care enrollee population, schizophrenia was the only mental health diagnosis at the time of enrollment associated with persistent high health care utilization (risk ratio [RR], 1.50; 95% CI, 1.20-1.86). Additional characteristics associated with persistent high utilization included age between 31 and 50 years (RR, 1.20; 95% CI, 1.02-1.41), dual enrollment in Medicaid and Medicare (RR, 1.26; 95% CI, 1.09-1.45), chronic pain diagnoses (RR, 1.26; 95% CI, 1.04-1.53), and multimorbidity (RR, 1.43; 95% CI, 1.25-1.63).

CONCLUSIONS: Among adults newly enrolled in Medicaid managed care, certain diagnoses noted at the time of enrollment into the plan are associated with persistent high health care utilization over the first 2 years, suggesting that targeting early supportive case management to these individuals could optimize care and reduce health care costs.

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1 year, particularly in managed care settings, can help better identify at-risk individuals in population management.

In this retrospective cohort study, we leverage the rich, longitudinal health care data from a managed care integrated health care system in California to examine the association between specific patient characteristics and persistent high health care utilization among adults in Medicaid managed care who were high utilizers in their first year of enrollment. Leveraging a stable, longitudinal cohort of managed Medicaid recipients, we hypothesized that certain patient comorbidities can be identified as risk factors for persistent high health care utilization.

METHODS

Setting and Participants

This is a retrospective cohort study using electronic health record data from Kaiser Permanente Northern California (KPNC), a large multispecialty health care system serving nearly 4.4 million people, including more than 300,000 Medicaid patients.¹⁰ We included nonelderly adults (aged 18-64 years) who were newly enrolled (no enrollment in the prior 12 months) in Medicaid managed care between June and December 2014 (n = 28,209). Previously, cost-based definitions have been used when using Medicaid claims data to define high utilizers.¹¹ We identified the subset of short-term high utilizers (n = 1414), individuals who were in the top 5% of utilization costs per patient during their first 12 months of enrollment (June 2014-December 2015). Costs calculated included all inpatient and outpatient costs, including drug costs; however, costs of inpatient psychiatric hospitalizations were excluded. Two individuals were excluded because they were not enrolled in KPNC Medicaid managed care for at least a month in their first and second year of enrollment. Patients were all enrolled in KPNC insurance during the time of the study but did have churning between Medicaid and commercial KPNC insurance. Persistent high utilizers were defined as the subset of patients from the first-year cohort who had persistent high utilization in the second year after their enrollment (June 2015-December 2016) (eAppendix Figures 1 and 2 [eAppendix available at ajmc.com]).

Outcomes of Interest

Covariate information was collected from data generated during the first 12 months of enrollment, prior to the outcome of interest. We identified several factors that may be associated with high health care utilization risk, such as demographics (age, gender, race, English as first language, neighborhood median income), insurance coverage (dual enrollment in Medicaid and Medicare, months enrolled), prior primary care health services use, and comorbid condition diagnoses as defined by *International Classification of Diseases, Ninth Revision*

TAKEAWAY POINTS

Diagnoses of mental health conditions, substance use, and other comorbid medical conditions at enrollment for Medicaid patients can predict high utilization over the first year. Among high utilizers, only patients with schizophrenia, chronic pain, and comorbid medical illness showed significantly increased odds of long-term high utilization over the second year. Although these data are limited to a single health care system, they provide new evidence regarding Medicaid enrollees in managed care at risk for long-term high health care spending within 2 years of enrollment.

- ▶ This study shows that the higher risk of utilization with schizophrenia and chronic pain is associated with persistent high utilization.
- ▶ Medical comorbidities are associated with higher risk of persistent high health care utilization in the population with severe mental illness after the first year of enrollment into managed Medicaid.

and *Tenth Revision* codes¹² (severe depression, anxiety, bipolar disorder, schizophrenia, chronic pain, active cancer, alcohol abuse, and drug abuse). We also included a measure of chronic comorbid conditions using the Charlson Comorbidity Index (CCI).¹³

Statistical Analyses

Bivariate analyses were conducted using χ^2 tests to assess differences in the high-utilizer and non-high-utilizer groups over the first year. Multivariable Poisson regression, with a robust variance estimator, was used to determine the association between SMI and high utilization (top 5% of utilization during the year of concern) over the first and second years, controlling for demographics, clinical characteristics, and past utilization in 2 separate models. All variables were included in the 2 models regardless of statistical significance in univariate models. The analyses were conducted in SAS version 9.4 (SAS Institute), and the study was approved by the KPNC Institutional Review Board.

RESULTS

We identified 1428 adults who were in the top 5% of spenders during their first year of Medicaid managed care enrollment, of whom 14 patients died over the second year of enrollment, leaving 1414 patients in the second-year cohort (Table 1). The median length of enrollment per year was 365 days for both high utilizers and non-high utilizers over the first year after enrollment. During the first year after enrollment, patients with a CCI score greater than 1 and a diagnosis of any SMI, chronic pain, active cancer, or substance use disorder were significantly more likely to be high utilizers (Table 2). Within the cohort of the first-year high-utilizer population, only 667 patients (47%) had persistent high utilization in the second year. Only certain patient characteristics were noted to be associated with continued risk for being a persistent high utilizer in the second year after their enrollment (Table 1). Controlling for other factors, individuals with schizophrenia had higher risk of being persistent high utilizers into the second year (risk ratio [RR], 1.50; 95% CI, 1.20-1.86) relative to those without any mental health diagnosis (Table 2). In contrast, anxiety, depression,

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TABLE 1. Baseline Demographic and Health Care Characteristics of Cohort of New Medicaid Members and the Subcohort of High Utilizers (patients in the top 5 percentile of cost of care in the first year after enrollment)

Variable		Total	First-year high utilization		P
			No	Yes (top 5%)	
Age in years, median (IQR)		36 (26-49)	35 (26-49)	44 (30-54)	<.001
BMI (kg/m ²), median (IQR)		27.7 (23.8-32.6)	27.6 (23.7-32.5)	29.4 (25.0-35.0)	<.001
Neighborhood median income (\$1000s), median (IQR)		71.5 (51.3-97.1)	71.8 (51.4-97.3)	67.9 (47.9-93.8)	<.001
Variable	Category	n = 28,509 n (%)	n = 27,080 n (%)	n = 1428 n (%)	P
Sex	Female	17,310 (60.7)	16,418 (60.6)	892 (62.5)	.17
Race and ethnicity	White	11,207 (39.3)	10,576 (39.1)	631 (44.2)	<.001
	Asian/Pacific Islander	4721 (16.6)	4575 (16.9)	146 (10.2)	
	Black	3512 (12.3)	3267 (12.1)	245 (17.2)	
	Hispanic	6186 (21.7)	5893 (21.8)	293 (20.5)	
	Multiracial	1485 (5.2)	1387 (5.1)	98 (6.9)	
	Unknown	1397 (4.9)	1382 (5.1)	15 (1.1)	
English speaker	Yes	25,095 (88.0)	23,785 (87.8)	1310 (91.7)	<.001
Visited PCP	Yes	20,679 (72.5)	19,363 (71.5)	1316 (92.2)	<.001
Dual Medicare	Yes	1245 (4.4)	1101 (4.1)	144 (10.1)	<.001
Tobacco smoker	Never	15,906 (55.8)	15,124 (55.8)	782 (54.8)	<.001
	Former	4323 (15.2)	3974 (14.7)	349 (24.4)	
	Current	3445 (12.1)	3169 (11.7)	276 (19.3)	
	Not asked	4834 (17.0)	4813 (17.8)	21 (1.5)	
Any mental health Dx	Yes	4018 (14.1)	3485 (12.9)	533 (37.3)	<.001
Anxiety Dx	Yes	1536 (5.4)	1316 (4.9)	220 (15.4)	<.001
Schizophrenia Dx	Yes	195 (0.7)	144 (0.5)	51 (3.6)	<.001
Depression Dx	Yes	2672 (9.4)	2304 (8.5)	368 (25.8)	<.001
Bipolar Dx	Yes	631 (2.2)	502 (1.9)	129 (9.0)	<.001
Chronic pain Dx	Yes	366 (1.3)	271 (1.0)	95 (6.7)	<.001
Active cancer	Yes	116 (0.4)	45 (0.2)	71 (5.0)	<.001
Charlson Comorbidity Index score	0	18,654 (65.4)	18,061 (66.7)	593 (41.5)	<.001
	1	3632 (12.7)	3345 (12.4)	287 (20.1)	
	≥2	1840 (6.5)	1297 (4.8)	543 (38.0)	
	No utilization	4382 (15.4)	4377 (16.2)	5 (0.4)	
Alcohol abuse Dx	Yes	125 (0.4)	66 (0.2)	59 (4.1)	<.001
Drug abuse Dx	Yes	411 (1.4)	294 (1.1)	117 (8.2)	<.001

BMI, body mass index; Dx, diagnosis; IQR, interquartile range; PCP, primary care provider.

comorbid anxiety and depression, and bipolar disorder were not associated with persistent high utilization.

Other factors associated with persistent high utilization included age between 31 and 50 years (reference: aged 18-30 years; RR, 1.20; 95% CI, 1.02-1.41), dual enrollment in Medicaid and Medicare (RR, 1.26; 95% CI, 1.09-1.45), having a chronic pain diagnosis (RR, 1.26; 95% CI, 1.04-1.53), and having a CCI score of 2 or more (RR, 1.43; 95% CI, 1.25-1.63). Enrollment in Medicaid managed care for less than a full 12 months in the first year was associated with lower

risk of persistent high utilization (RR, 0.69; 95% CI, 0.49-0.97) (Table 2). Patients with the following characteristics were less likely to be high utilizers in the second year despite being high utilizers in the first year after enrollment: female sex (RR, 0.79; 95% CI, 0.70-0.88) and obesity relative to a body mass index in normal or overweight range (RR, 0.87; 95% CI, 0.77-0.97).

DISCUSSION

Only a subset of the high-utilizer population has persistent increased utilization in the second year of enrollment into managed Medicaid. In this managed integrated care setting, schizophrenia was associated with persistent health care utilization among adult Medicaid managed care enrollees, whereas other mental health diagnoses were not associated with it. Previous predictive modeling studies have also identified schizophrenia as a risk factor for short-term health care utilization.¹⁴ In addition, this study is one of the first to identify differences in risk of persistent high utilization by type of mental illness. The common use of carve-outs of mental health care delivery services from managed Medicaid as seen in the population studied could be leading not only to the exacerbation of poor care for their mental health diagnoses, but also to overall increased medical costs for the managed care systems that are treating other medical problems not directly associated with their mental illness.

This study identified additional risk for persistent high health care utilization in clinically complex subgroups. The finding of chronic pain being associated with persistent high utilization builds on prior evidence regarding its association with acute health care utilization. A study in an integrated health system has shown an association with high acute use of hospital services associated with diagnoses of chronic pain.¹⁵ The finding of higher risk among middle-aged (31-50 years) and male enrollees was not anticipated. However, it may reflect the changing demographics of the Medicaid population due to the Affordable Care Act enrollment of newly eligible middle-aged adults and men who might have had no previous health care coverage, resulting in high levels of unmet health care needs.¹⁶ In addition, pregnancy-related costs in women could be associated with high utilization over the first year of enrollment that decreases in the second year.

Two other factors were associated with lower risk of persistent high health care utilization in this population. Individuals enrolled in Medicaid managed care for less than 12 months had lower risk of persistent high utilization relative to individuals with a full 12 months of coverage. Lower rates of enrollment may reflect access to other types of health insurance and spending rather than gaps in access to medical care services. However, our finding of a protective effect of obesity was unexpected. It is possible that body mass index is correlated with some unmeasured factors or that obese individuals may be targeted for health system interventions at the time of enrollment that positively affect health services use in the following months. Further research is needed to refute or confirm these findings. In addition, use of any primary care was not associated with lower risk of persistent high utilization. Although prior utilization might be an indicator of health care needs, we expected that increased access to preventive care services would reduce the need for health care services over time. Additional research to understand how these patients are using primary care might identify potential missed opportunities.

Strengths and Limitations

Strengths of this study include the ability to follow newly enrolled Medicaid managed care enrollees for 2 years following entry. In addition, we can use information collected in the first year of enrollment to predict persistent high health care utilization. However, this study also has several limitations. First, this study uses cost data generated within the health care system to identify high utilizers. However, due to lack of integration in payment and care delivery related to carve-outs, information about behavioral health services incurred outside of this system is missing. Consequently, individuals with high behavioral health costs incurred by out-of-system contractors could have had lower measured costs. The findings in this study suggest associations but do not necessarily prove causation. The findings may not be generalized to all Medicaid managed care populations, because KPNC’s Medicaid population may not be representative of the national population. However, the findings may be highly relevant to other integrated care

TABLE 2. Percentage and Adjusted RRs (from Poisson regression) of Persistent High Utilization Among First-Year High Utilizers During the Second Year After Enrollment, Categorized by Baseline Characteristics Taken in the First Year of High Utilization*

Variable	Category	n	n with persistent high utilization	% with persistent high utilization	Adjusted RR	95% CI
Total		1426	667	46.8		
Mental health Dx	Depression	210	50	45.7	1.01	0.85-1.19
	Anxiety	63	26	41.3	0.97	0.72-1.30
	Depression and anxiety	102	52	51.0	1.11	0.91-1.37
	Bipolar	106	50	47.2	1.05	0.84-1.30
	Schizophrenia	51	36	70.6	1.50	1.20-1.86
	None	894	407	45.5	Reference	
Chronic pain Dx	Yes	95	55	57.9	1.26	1.04-1.53
Active cancer	Yes	71	35	49.3	0.91	0.71-1.18
Charlson Comorbidity Index score	0	592	229	38.7	Reference	
	1	287	120	41.8	1.08	0.91-1.28
	≥2	542	315	58.1	1.43	1.25-1.63
BMI (kg/m²)	< 18.5	28	10	35.7	0.80	0.51-1.28
	18.5-29.9	725	358	49.4	Reference	
	≥30	664	293	44.1	0.87	0.77-0.97
Age in years	18-30	359	135	37.6	Reference	
	31-50	576	280	48.6	1.20	1.02-1.41
	51-64	491	252	51.3	1.15	0.97-1.36
Sex	Female	891	365	41.0	0.79	0.70-0.88
	Male	535	302	56.5	Reference	
Race and ethnicity	White	630	310	49.2	Reference	
	Asian/Pacific Islander	145	61	42.1	0.87	0.71-1.07
	Black	245	118	48.2	1.01	0.86-1.17
	Hispanic	293	128	43.7	0.93	0.79-1.10
	Multiracial	98	44	44.9	0.95	0.76-1.18
Neighborhood median income	< \$50,000	386	174	45.1	0.91	0.71-1.17
English speaker	No	117	50	42.7	0.95	0.75-1.20
≥ 1 visit to PCP	No	110	54	49.1	0.99	0.80-1.24
Enrollment	< 12 months	67	22	32.8	0.69	0.49-0.97
Dual Medicare/Medicaid	Yes	144	89	61.8	1.26	1.09-1.45
Tobacco smoker	Never	781	338	43.3	Reference	
	Former	349	186	53.3	1.09	0.96-1.24
	Current	275	131	47.6	1.00	0.86-1.16
Alcohol abuse Dx	Yes	59	29	49.2	0.99	0.75-1.32
Drug abuse Dx	Yes	116	55	47.4	0.93	0.75-1.15

BMI, body mass index; Dx, diagnosis; PCP, primary care provider; RR, risk ratio. *Values in bold significant at P < .05.

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delivery systems that are increasingly providing care to vulnerable Medicaid enrollees.

Overall, this study focuses only on the characteristics associated with high utilization in the 2 years following enrollment when there can be pent-up health care demand. The driving forces behind high utilization in a more established managed Medicaid population can differ from those found to be associated with high utilization after enrollment here. Therefore, the findings in this study can be useful in targeting patients early in their Medicaid enrollment but may not apply to longer-term managed Medicaid patients.

CONCLUSIONS

Leveraging rich, longitudinal electronic health record data, we examined the association between patient characteristics at enrollment and the risk of persistent high health care utilization among adults newly enrolled in Medicaid managed care. Diagnoses of schizophrenia, chronic pain, and multimorbidity were found to be associated with persistent high health care utilization into the second year following enrollment. Targeting at-risk patients for intensive case management during the first year of managed care enrollment may be one important strategy for reducing costs and increasing the value of care for Medicaid enrollees. ■

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of the manuscript (SB); critical revision of the manuscript for important intellectual content (SB, AA, ASA); statistical analysis (SB, AA, PK); obtaining funding (ASA); administrative, technical, or logistic support (SB); and supervision (ASA).

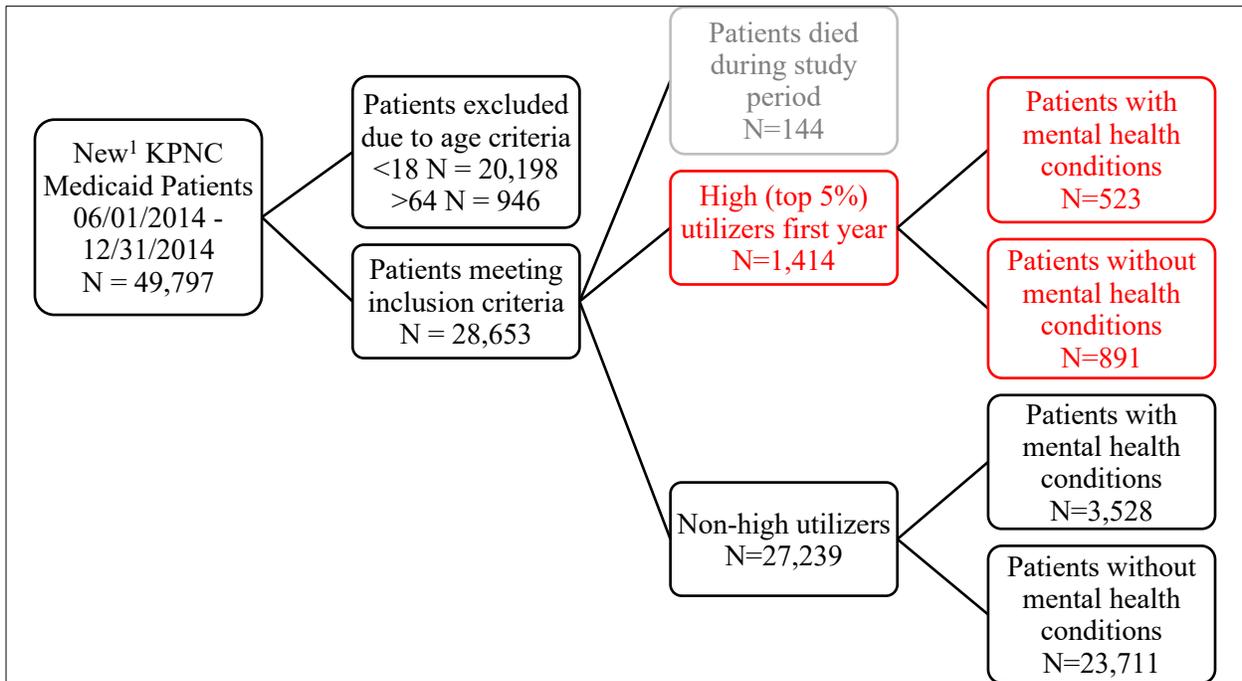
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eAppendix Figure 1. Cohort Creation - First Year High Utilizer Cohort Creation



¹ No Medicaid enrollment in last 12 months

eAppendix Figure 2. Cohort Creation - Second Year Persistent High Utilizer Cohort Creation

