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Changes in expenditures for Medicaid enrollees with a behavioral health diagnosis: 2005-2010

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ABSTRACT

Objective: The Affordable Care Act requires care coordination for individuals with behavioral health problems due to frequent physical health problems. The potential for cost savings is often used to motivate the use of care coordination. This paper examined Medicaid physical and behavioral health expenditures over a six year period for individuals with a behavioral health diagnosis to explore whether current and future costs are sufficient to justify care coordination.
Methods: The analysis used Florida Medicaid enrollment and claims data. Transitions between expenditure quintiles were examined for people with a behavioral health diagnosis, as was the likelihood of exiting the Medicaid program. We also examined the distribution of expenditures related to physical and mental health problems and how this changed over time.
Results: Individuals with a behavioral health diagnosis were in higher expenditure groups in 2005, were more likely to move to higher expenditure groups, and were less likely to exit the Medicaid program between 2005 and 2010 than people without a behavioral health diagnosis. Individuals with behavioral health problems had higher expenditures for physical health care than behavioral health care.
Conclusions: Medicaid expenditures are high for people with a behavioral health diagnosis and have a higher likelihood of increasing over time. Given high current and future costs, modest reductions in costs may be sufficient to justify the use of care coordination programs for people with physical and behavioral health diagnoses.

Key Words: Medicaid expenditures, Behavioral health diagnosis, Trends, Care coordination, Markov analysis

1. INTRODUCTION

Medicaid programs pay for a substantial amount of mental health services provided to patients in the US, increasing from 16% of all expenditures in 1986 to 26% in 2003.[1] Among Medicaid beneficiaries, individuals with a mental health diagnosis have higher expenditures than people without a mental health diagnosis. In addition, individuals with a behavioral health (mental health and/or substance abuse) diagnosis are more likely to have very high costs,[1,2] comprising about one-third of all high cost enrollees.[1] Such high costs are not due solely to mental illness as individuals with serious mental illness often have significant physical health problems as well. As a result of the high rate of physical health problems among people with mental illness, the Patient Protection and Affordable Care Act (ACA) requires access to care coordination as an important component of quality health care for individuals with mental illness.

Studies have suggested that high cost users be targeted for intensive case management services.[3] Case management can take many forms such as care coordination for high-cost individuals with mental illness. Such suggestions for case management have mostly been driven by short-term data,

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with studies typically examining costs over a two year period. Several models have been developed to predict costs in the following year given characteristics in a base year.[4–8] One exception was Bayerstadler and colleagues, who used data from several prior years used to predict costs one year into the future.[9] Case management programs can use such predictions to achieve economic effectiveness by targeting interventions toward individuals most likely to have high costs. However, intensive case management has the potential to improve short-term outcomes (*e.g.*, costs one year into the future) and longer-term outcomes (reducing costs over several years by preventing declines in health status). Thus, in order to assess the potential benefits of a case management program, it is crucial to understand whether investments in case management programs today have potential longer-term benefits beyond a one year period. While individuals with a behavioral health diagnosis tend to have higher costs in the current year, less is known about the longer-term stability of expenditures for individuals with a behavioral health diagnosis. For example, whether expenditures remain consistently high for individuals or whether the individuals in the high-cost group change markedly over time.

Medicaid programs cover a substantial number of individuals with a serious mental illness. One challenge is that Medicaid programs tend to have high turnover. For example, one study found that 21% of adults in Medicaid were not enrolled 12 months later.[10] Thus, it is important to understand whether people with a behavioral health diagnosis and high expenditures typically remain in the program. While persistence of high costs provide greater potential benefits for Medicaid programs to provide case management, high rates of disenrollment present numerous challenges to the cost effectiveness of potential interventions.

This paper looks at a six year time frame using Florida Medicaid data to examine changes in expenditures for individuals with a 2005 behavioral health diagnosis. We focus on individuals with a behavioral health diagnosis because prior research indicates they comprise a disproportionate share of high-cost cases, and thus may be candidates for case management services. More specifically, this paper examines the distribution of expenditures related to physical and mental health problems, and how this changes over time. The paper also looks at how people with a behavioral health diagnosis transition between higher and lower expenditure groups between 2005 and 2010. In addition, we compare individuals with and without a behavioral health diagnosis to examine whether a behavioral health diagnosis is associated with the likelihood of exiting the Medicaid fee-for-service program or having expenditures in the top quintile of 2010 expenditures. Implications for case management and care coordination interventions are also discussed.

2. METHODS

2.1 Data

Florida Medicaid enrollment and claims files from 2005 and 2010 were the data source. Critical enrollment data included beneficiary demographics (age, sex, race, and eligibility status) and Medicaid coverage periods. Medicaid expenditures and International Classification of Diseases Version 9 (ICD-9) diagnoses were available from inpatient, outpatient, and physician settings. Expenditures were classified as physical health or mental health based on the primary diagnosis on the claim. Expenditures were also available from prescription drug claims which are classified a physical and behavioral health based on their typical usage.[11] Individuals had to be enrolled in the Medicaid program all 12 months of 2005. No restrictions were placed on age, but individuals were also excluded if they received services from intermediate care facilities (ICF) for mental retardation in 2005 or 2010. Individuals receiving ICF services are almost certain to remain high cost cases, and case management would not reduce their need for services.

Florida Medicaid offers coverage through different programs and has undergone a number of changes in the last decade. Medicaid beneficiaries have been able to choose coverage through managed care organizations throughout this time period. While most beneficiaries do not select this option, those that do were excluded from this analysis because encounter data were not available. For those beneficiaries receiving coverage through the fee-for-service program, Florida implemented a Prepaid Mental Health plan (PMHP) carve-out in 1997 in the Panhandle region of the State and expanded statewide in 2006-2007. Beneficiaries received their physical health care and all prescription medications through the fee-for-service program, with behavioral health services provided through managed care organizations. Data from PMHP encounters were included in this analysis. In 2006, Florida Medicaid reform required almost all beneficiaries to enroll in managed care plans in Duval and Broward counties and in 2007 was expanded to three smaller counties (Baker, Clay, and Nassau). Data were not available for these plans and consequently these areas were excluded removing about 14% of Medicaid enrollees from the sample.

2.2 Analytic methods

The distribution of expenditures (including all physical and behavioral healthcare) was computed using all Medicaid beneficiaries with individuals placed into their respective quintiles for each year. The highest quintile was further divided into two groups due to the range of costs for this

group.

A transition matrix was computed to determine how individual expenditures changed over the six years. While the distribution was computed using all Medicaid beneficiaries, the transition matrix is limited to people that had a claim with a primary or secondary ICD-9 diagnosis in the category for mental disorders (ICD-9 290-319) in 2005. A Markov analysis is appropriate when there are a limited number of alternatives, the alternatives are mutually exclusive and exhaustive, and the study is interested in transitions between the alternatives.[12] Thus, the transition matrix can be used to describe expenditures for individuals with a behavioral health diagnosis relative to others in the Medicaid population. Such a matrix provides more information than simply reporting the average change in expenditures between two points in time. The matrix probabilities were not adjusted for differences in individual characteristics. An alternative would be to estimate the transition probabilities from multinomial logistic regressions that control for individual characteristics. Thus, the analysis is more descriptive in nature.

Logistic regressions were used to examine whether individuals with a behavioral health diagnosis were more likely than those without a behavioral health diagnosis to remain in the fee-for-service Medicaid program, more likely to have expenditures increase or decrease, and more likely to have expenditures in the top quintile in 2010. Separate regressions were estimated for each of the six 2005 expenditure groups. Two of the dependent variables (remaining Medicaid enrolled and top quintile expenditures) were dichotomous variables and required a binomial logit regression, while changes in expenditures (higher expenditure group, lower expenditure group, exit; ref: same expenditure group) required a multinomial logit regression. Regressions included controls (measured in 2005) for age, race (Asian, black, Hispanic, other; white is the reference category), gender, eligibility status (SSI), Medicare coverage, a dummy variable denoting a behavioral health diagnosis, and dummy variables for 16 physical health diagnostic groups to account for non-behavioral health comorbidities. The physical health diagnostic groups were ICD-9001-139, infectious and parasitic diseases; 140-239, neoplasms; 240-279, endocrine, nutritional and metabolic diseases, and immunity disorders; 280-289, diseases of the blood and blood forming organs; 320-389, diseases of the nervous system and sense organs; 390-459, diseases of the circulatory system; 460-519, diseases of the respiratory system; 520-579, diseases of the digestive system; 580-629, diseases of the genitourinary system; 630-679, complications of pregnancy, childbirth, and the puerperium; 680-709, diseases of the skin and subcutaneous tissue; 710-739, diseases of the musculoskeletal system and connective tissue; 740-759, congenital anomalies; 760-779, certain conditions originating in the perinatal period; 780-799, symptoms, signs, and ill defined conditions; 800-999, injury and poisoning.

3. RESULTS

There were 974,619 with 12 months enrollment in 2005. Table 1 contains descriptive statistics for the sample. The first columns of the table contain descriptive statistics for the full sample, while the second set of columns only includes people with a behavioral health diagnosis in 2005 who remained Medicaid enrolled for all 12 months of 2010. The average age for the full sample was 36.6 (*SD* = 29.9). Approximately one quarter of the sample was black, one quarter was Hispanic, 35% was white, and the remaining 12% included other racial groups (*e.g.*, Asian, Native American and mixed race) and individuals where race was not reported. Fifty-eight percent of the sample was female. Twenty-three percent (n = 219,572) of the sample had a behavioral health diagnosis in 2005, of which 116,348 continued to be Medicaid enrolled for all of 2010. Thus, 47% of individuals with a behavioral health diagnosis in 2005 were not enrolled throughout 2010. The average age for the restricted sample was 34.0 (*SD* = 24.1). Twenty-one percent were Black, 21% was Hispanic, 41% was white, and the remaining 17% other racial groups. Fifty-three percent were female.

Table 1. Descriptive statistics for sample Florida Medicaid, 2005

	Full sample		Behavioral Health Diagnosis and Enrolled in 2010	
	Mean/%	**Std dev**	**Mean/%**	**Std dev**
Age	36.6	29.9	34.00	24.1
Female	57.7%		52.9%	
Race				
White	38.7%		41.4%	
Black	25.5%		21.0%	
Hispanic	24.5%		20.7%	
Other	11.3%		16.9%	
Dual eligible	53.2%		65.5%	
N	974,619		116,348	

Note. Behavioral Health Diagnosis and Enrolled in 2010 restricts the sample to individuals with a 2005 behavioral health diagnosis who were enrolled for all of 2010. Dual eligible denotes an individual was enrolled in both the Medicaid and Medicare programs.

Table 2 contains a breakdown the behavioral health diagnoses in the sample. Among people with a behavioral health diagnosis, the most common diagnoses include episodic mood disorders (includes major depressive disorder and bipolar disorder, 24.9%), specific delays in development (17.9%), schizophrenic disorders (17.8%), hyperkinetic syndrome of childhood (includes attention-deficit hyperactivity disorder, 15.3%), neurotic disorders (14.4%), and nondependent abuse of drugs (14.2%).

Table 2. Proportion of people with behavioral health diagnoses in 2005

ICD-9	ICD-9 Description	N	%
290	Dementias	1,060	0.9%
291	Alcoholic psychoses	408	0.4%
292	Drug psychoses	762	0.7%
293	Transient organic psychotic conditions	1,212	1.0%
294	Other organic psychotic conditions	2,772	2.4%
295	Schizophrenic disorders	20,752	17.8%
296	Episodic mood disorders	28,994	24.9%
297	Paranoid states	621	0.5%
298	Other nonorganic psychoses	5,894	5.1%
299	Psychosis with origins specific to childhood	2,932	2.5%
300	Neurotic disorders	16,790	14.4%
301	Personality disorders	1,302	1.1%
302	Sexual deviations and disorders	184	0.2%
303	Alcohol dependence syndrome	1,506	1.3%
304	Drug dependence	2,235	1.9%
305	Nondependent abuse of drugs	16,527	14.2%
306	Physiological malfunction arising from mental factors	252	0.2%
307	Special symptoms or syndromes, nec	3,151	2.7%
308	Acute reaction to stress	519	0.5%
309	Adjustment reaction	8,726	7.5%
310	Specific nonpsychotic mental disorders following organic brain damage	556	0.5%
311	Depressive disorder, nec	13,772	11.8%
312	Disturbance of conduct	5,769	5.0%
313	Disturbance of emotions specific to childhood and adolescence	3,166	2.7%
314	Hyperkinetic syndrome of childhood	17,834	15.3%
315	Specific delays of development	20,781	17.9%
316	Psychic factors associated with diseases classified elsewhere	35	0.0%
317	Mild mental retardation	562	0.5%
318	Other specified mental retardation	719	0.6%
319	Unspecified mental retardation	3788	3.3%

Note. Total sample of individuals with a behavioral health diagnosis was 116,348. N denotes the number of people with the health condition in 2005. Individuals can have multiple diagnoses.

Table 3 contains the breakdown of expenditures between physical and behavioral health problems. As noted above, the distribution of expenditures was computed using all Medicaid beneficiaries who were enrolled for all 12 months of the year. Spending patterns were examined for individuals that had a behavioral health diagnosis in 2005. With the exception of the lowest quintile (0-20th percentiles), physical health expenditures were higher than behavioral health expenditures for individuals with a behavioral health diagnosis. Nearly two-thirds of expenditures for individuals in the top decile (the 91st-100th percentiles) were related to physical health problems in 2005.

Table 3. Medicaid expenditures in 2005 and 2010 by 2005 expenditure grouping (in US $)

2005 Percentile	N	Expenditures in 2005					Expenditures in 2010				
		Mean $	Std dev	%	Min	Max	Mean $	Std dev	%	Min	Max
≤ 20	1,315										
PH expenditures		33	42.2	40%	0.0	143.9	1,512.4	9,001.3	70%	0.0	192,522.6
BH expenditures		48.8	39.1	60%	0.0	145.0	644.4	4,084.9	30%	0.0	79,428.7
Total expenditures		81.8	38.9		0.0	145.1	2,166.8	10,039.4		0.0	196,213.7
21-40	8,217										
PH expenditures		316.5	208.5	65%	0.0	811.6	1,611.8	7,587	68%	0.0	188,184.1
BH expenditures		168.5	169.6	35%	0.0	810.1	743.3	4,234.7	32%	0.0	137,047.4
Total expenditures		485	194		145.4	815.4	2,355.1	8,835.7		0.0	188,387.3
41-60	1,9455										
PH expenditures		997.1	606.5	63%	0.0	2,443.7	2,248.3	9,353.9	66%	0.0	442,732.1
BH expenditures		595.5	567.3	37%	0.0	2,450.8	1,148.8	4,687.2	34%	0.0	142,935.5
Total expenditures		1,592.6	469.1		815.7	2,450.9	3,397.1	10,616.8		0.0	442,868.6
61-80	36,736										
PH expenditures		2,793.3	1,910.9	58%	0.0	7,791.6	3,822.5	11,792.2	69%	0.0	586,057.5
BH expenditures		2,028.2	1,853.3	42%	0.0	7,782.2	1,683.8	5,825.9	31%	0.0	163,182.9
Total expenditures		4,821.5	1,530.3		2,450.9	7,795.1	5,506.3	13,402.5		0.0	586,570.3
81-90	27,351										
PH expenditures		6,846.9	4,438.2	58%	0.0	18,018.9	7,797.6	17,514.4	74%	0.0	618,847.3
BH expenditures		4,985.4	4,210.9	42%	0.0	17,942.5	2,783.5	7,298.7	26%	0.0	254,550.6
Total expenditures		11,832.3	2,832.1		7,795.3	18,050.2	10,581.1	19,301.5		0.0	622,923.7
91-100	23,274										
PH expenditures		29,084.8	36,778.9	64%	0.0	2,041,291.9	35,087.3	47,160.8	86%	0.0	2,841,853.8
BH expenditures		16,536.2	22,105.4	36%	0.0	313,815.2	5,738.2	13,727.7	14%	0.0	385,709.9
Total expenditures		45,621	36,336.9		18,051.3	2,041,453.4	40,825.5	47,641.5		0.0	2,842,197.8

Note. PH denotes expenditures for physical health care; BH denotes expenditures for behavioral health care. The sample includes individuals with 12 months of enrollment in 2005 and 2010 with a behavioral health diagnosis (ICD-9 290-319) in 2005

Average total expenditures were higher in 2010 for individuals in the 0-20th, 21st-40th, and 41st-60th percentiles. Average expenditures were lower in 2010 for individuals in the remaining expenditure groups. The proportion of expenditures associated with behavioral health problems was lower in 2010 than 2005. For example, the percentage of expenditures associated with physical health problems increased from 64% to 86% among individuals in the top decile, and from 58% to 74% among people in the second decile (the 81st-90th percentiles).

Table 4 contains the transition matrix for 2005 and 2010 expenditures. The rows represent 2005 spending levels. For example, there were 2,921 individuals with a behavioral health diagnosis that had total expenditures in the bottom 20% of the full sample in 2005. There were 46,474 individuals with a behavioral health diagnosis that had total expenditures in the top 10% of the full sample in 2005. The columns represent 2010 spending levels. For example, there were 12,752 people that had a behavioral health diagnosis in 2005 and were in the bottom 20% of total expenditures for the full sample in 2010. By examining the transition matrix, we can determine how many people had decreasing, similar, or increasing expenditures between 2005 and 2010 given their level of expenditures in 2005.

Several results are noteworthy. First, individuals with a behavioral health diagnosis were overrepresented in higher expenditure groups in 2005. The lowest expenditure quintile (by definition) included 20% of all Medicaid beneficiaries. However, only 1.1% of individuals (1,315/116,348) with a behavioral health diagnosis were in the bottom quintile of expenditures. Similarly, only 7% (8,217/116,348) of individuals with a behavioral health diagnosis had expenditures in the second quintile. Twenty-four percent (27,351/116,348) and 20% (23,274/116348) respectively of individuals with a behavioral health diagnosis had expenditures in the top two deciles of expenditures. Second, most individuals in the

top decile of expenditures in 2005 continued to have high expenditures. Seventy percent remained in the top decile in 2010 with 30% moving to a lower expenditure level. Third, the remaining groups had greater changes in expenditures with people having either increased or decreased expenditures. For example, among the 16,455 individuals in the 41st-60th percentiles (the third quintile of expenditures) in 2005, only 23% (n = 4,416) remained in the same expenditure group in 2010. Thirty-one percent (n = 5,952) increased to the 61st-80th percentiles of expenditures in 2010, while 15% (n = 2,879) and 6% (n = 1,110) increased to the top two deciles of expenditures. Thirteen percent (n = 2,550) had expenditures decline to the bottom quintile, and 13% to the second quintile. Thus, 26% (13%+13%) moved to lower expenditure groups and 52% (31%+15%+6%) moved to higher expenditure groups. Among the 36,736 individuals in the 61st-80th percentiles in 2005, only 26% (n = 9,676) remained in the same expenditure group in 2010. Twenty-two percent (n = 8,218) increased to the 81st-90th percentile of expenditures and 12% (n = 4,282) increased to the top decile. Ten percent (n = 3,542) had expenditures decline to the bottom quintile, 12% (n = 4,301) to the second quintile, and 18% to the third quintile. Thus, 40% (10%+12%+18%) moved to lower expenditure groups and 34% (22%+12%) moved to higher expenditure groups.

Table 4. Transition matrix: Expenditures in 2005 and 2010, Individuals with a behavioral health diagnosis in 2005

2005 Percentile	2010 Percentile						Total N
	≤ 20	21-40	41-60	61-80	81-90	91-100	
≤ 20							
N	407	298	264	222	71	53	1,315
%	31%	23%	20%	17%	5%	4%	
21-40							
N	1,477	1513	2,218	1,938	760	311	8,217
%	18%	18%	27%	24%	9%	4%	
41-60							
N	2,550	2,548	4,416	5,952	2,879	1,110	19,455
%	13%	13%	23%	31%	15%	6%	
61-80							
N	3,542	4,301	6,717	9676	8,218	4,282	36,736
%	10%	12%	18%	26%	22%	12%	
81-90							
N	1,777	2,264	3,494	5,417	6,536	7,863	27,351
%	7%	8%	13%	20%	24%	29%	
91-100							
N	589	603	1,004	2,036	2,675	16,367	23,274
%	3%	3%	4%	9%	12%	70%	
Total							
N	10,342	11,527	18,113	25,241	21,139	29,986	116,348
%	9%	10%	16%	22%	18%	26%	

Note. The transition matrix includes individuals with 12 months of enrollment in 2005 and 2010 with a behavioral health diagnosis (ICD-9 290-319) in 2005. The 2005 percentile denotes where individual expenditures placed in the 2005 distribution for all beneficiaries. The 2010 percentile denotes where individual expenditures placed in the 2010 distribution for all beneficiaries.

Table 5 contains the regression results. The first set of results examined the likelihood of individuals not being enrolled for all 12 months of 2010. The analysis of exiting Medicaid used all 974,619 individuals who were Medicaid enrolled for 12 months in 2005. The regression results indicate that individuals with a behavioral health diagnosis were less likely to leave the Medicaid fee-for-service program than other beneficiaries. The odds ratios were less than 1.0 and achieved statistical significance for the 0-20th, 21st-40th, 41st-60th, and 91st-100th percentiles. The exception to the findings was the 61st-80th percentiles with the odds ratios indicating a higher rate of exiting for Medicaid beneficiaries with a behavioral health diagnosis.

The second set of columns contains the multinomial logistic regression results. The dependent variable was a categorical variable that denoted whether the individual exited Medicaid, moved to a higher expenditure group, or moved to a lower expenditure group. Staying in the same expenditure group was the reference. Similar to the first set of regression results,

all 974,619 individuals were included in the analysis. Individuals with a behavioral health diagnosis were less likely to move to a lower expenditure group and more likely to move to a higher expenditure group. The odds ratios for moving to a lower expenditure group achieved statistical significance for the 21st-40th, 41st-60th, 61st-80th, 81st-90th and 91st-100th percentiles. Individuals in the bottom quintile of 2005 expenditures obviously could not move to a lower expenditure group. The odds ratios for moving to a higher expenditure group achieved statistical significance for the achieved statistical significance for the 0-20th, 21st-40th, 41st-60th, 61st-80th, and 81st-90th percentiles. Thus, for each level of 2005 costs, individuals with a behavioral health diagnosis were more likely to have higher costs in 2010 and less likely to have lower costs. It should be noted that the result for the 81st-90th percentiles was not consistent with the remaining expenditure groups, and indicated a behavioral health diagnosis in this 2005 expenditure group was associated with a lower likelihood of escalating to the highest 2010 expenditure group.

The final set of regression results examined the likelihood of being in the top quintile of expenditures in 2010. The logistic regression included only people who were enrolled for all 12 months of 2010. Among individuals remaining Medicaid enrolled, logistic regressions indicated that individuals with a behavioral health diagnosis were more likely to have expenditures in the top quintile in 2010. The odds ratios achieved statistical significance for the 21st-40th, 41st-60th, 61st-80th, and 91st-100th percentiles. Thus, for each level of 2005 costs, individuals with a behavioral health problem in 2005 were more likely to have costs in the top quintile in 2010.

4. Discussion

The results have several policy implications that relate to evaluating the effectiveness of case management programs, the potential importance for coordination of physical and mental health care, and the potential cost effectiveness of such activities. Each are addressed below.

Table 5. Logistic regression results - The effect of a behavioral health diagnosis on Medicaid exit and expenditure categories, Odds ratios for differences between individuals with and without a behavioral health diagnosis

2005 Percentile	Specification #1 - Dichotomous Logistic				Specification #2 - Multinomial Logistic				Specification #3 - Dichotomous Logistic			
	Dependent var	Behavioral Health			Dependent var	Behavioral Health			Dependent var	Behavioral Health		
		Odds ratio	95% CI			Odds ratio	95% CI			Odds ratio	95% CI	
≤ 20	Exit Medicaid 2010	0.774	0.717	0.836	Exit Medicaid 2010	0.948	0.846	1.062	Top 20% in 2010	0.97	0.802	1.173
					Higher Expenditures	1.368	1.212	1.544				
21-40	Exit Medicaid 2010	0.883	0.855	0.912	Exit Medicaid 2010	0.968	0.912	1.027	Top 20% in 2010	1.359	1.264	1.462
					Lower Expenditures	0.894	0.827	0.967				
					Higher Expenditures	1.213	1.139	1.292				
41-60	Exit Medicaid 2010	0.953	0.93	0.976	Exit Medicaid 2010	1.051	1.011	1.092	Top 20% in 2010	1.481	1.417	1.548
					Lower Expenditures	0.892	0.85	0.935				
					Higher Expenditures	1.364	1.307	1.424				
61-80	Exit Medicaid 2010	1.024	1.002	1.046	Exit Medicaid 2010	1.009	0.978	1.041	Top 20% in 2010	1.283	1.244	1.324
					Lower Expenditures	0.874	0.845	0.905				
					Higher Expenditures	1.18	1.137	1.225				
81-90	Exit Medicaid 2010	0.986	0.959	1.015	Exit Medicaid 2010	0.889	0.851	0.93	Top 20% in 2010	1.011	0.974	1.049
					Lower Expenditures	0.897	0.856	0.939				
					Higher Expenditures	0.849	0.806	0.893				
91-100	Exit Medicaid 2010	0.942	0.913	0.971	Exit Medicaid 2010	0.925	0.895	0.956	Top 20% in 2010	1.253	1.19	1.32
					Lower Expenditures	0.945	0.904	0.989				

Note. The sample includes all Medicaid beneficiaries with 12 months of enrollment in 2005. Specification #1 is a dichotomous logistic regression with dependent variable (Exit Medicaid 2010) denoting the individual did not have 12 months of enrollment in 2010. Specification #2 is a multinomial logistic regression where the categorical dependent variable denotes whether the beneficiary exited Medicaid, had expenditures in a lower cost category, or had expenditures in a higher cost category relative to the reference of the same cost category. Specification #3 is a dichotomous logistic regression with the dependent variable (Top 20% in 2010) denoting the individual was in the top quartile of expenditures in 2010. The reported odds ratios are derived from the coefficients on the behavioral health diagnostic category. All regressions also included variables denoting beneficiary age, gender, race (Asian, Black, Hispanic; ref: White), whether dual eligible (i.e., Medicare enrolled), and 16 variables denoting diagnosis.

Case management programs may be targeted towards high cost patients,[3] patients with specific high cost diseases,[13] or patients at-risk for repeated hospitalizations.[14] For example, Kaiser Permanante implemented an Assertive Community Treatment program with identified high-cost users of behavioral health care.[15] Case management can be viewed as an investment that will reduce costs and improve outcomes, but while most interventions and evaluations have been short-term in nature, such cost savings and improved outcomes may take several years to be observed. For example, a review of three Medicare case management demonstrations found little impact in the first year after implementation.[13] Thus, it is likely that a longer time frame needs to be considered to build a cost effectiveness argument for case management. The results of this study found that costs were higher in the base year for people with a behavioral health diagnosis, and

remained high five years later. The persistent high costs were expected given the chronic nature of several high cost behavioral health problems including schizophrenia and mood disorders. Thus, case management programs focused on individuals with a behavioral health diagnosis have the potential to reduce current and future costs, and a cost effectiveness analysis should include the reduction in future costs.

The Affordable Care Act focuses on care coordination for people with mental health problems and the results in this paper suggest that the emphasis is well placed. The distribution of expenditures among Florida Medicaid recipients indicates that individuals with behavioral health problems use more physical health services than behavioral health services. In addition, the distribution becomes more skewed towards physical health services over time with the shift occurring for a variety of potential reasons. Such trends suggest that physical health problems may be worsening over time, or perhaps the individual's need for behavioral health services has declined over time. Interventions designed to diagnosis physical health problems earlier may provide long-term benefits for individuals with mental health problems. Consequently, interventions that focus on both the mental and physical health of individuals may be cost effective for health plans. For example, recent expansions in the Medicaid program have led to an increase in the number of patients with diabetes diagnoses who are being treated earlier.[16]

More than one-third of the individuals left the Medicaid fee-for-service program between 2005 and 2010. However, the rate was lower for individuals with a behavioral health diagnosis than for other beneficiaries. Prior studies have also found that turnover of Medicaid beneficiaries is common. Twenty-one percent of adults in Medicaid were not enrolled 12 months later.[10] In addition, people who lose coverage often become uninsured, at least for some period of time, and loss of coverage is associated with numerous adverse outcomes.[17] The introduction of the ACA may change disenrollment patterns due to expanded eligibility, and health insurance exchanges may offer alternatives to the Medicaid program. At the same time, the potential cost effectiveness of any intervention will be reduced if individuals do not remain in the program, and a business model for any intervention must incorporate such attrition.

A potential intervention might focus on individuals with a behavioral health diagnosis. The intervention would have two goals. First, to work with individuals to keep them enrolled in the Medicaid program. While this would potentially increase Medicaid costs, overall public sector costs might be reduced if the adverse outcomes associated with treatment stoppages or gaps can be avoided (*e.g.*, criminal justice costs). In addition, a goal would be to reduce the progression of behavioral health problems in order to reduce future health care costs.

As with any study that uses administrative data, there are several shortcomings to the analysis. First, Medicaid data are examined from a single state, and the results may not generalize to all states. Second, any analysis of administrative data requires accurate and complete expenditure and diagnostic data. Third, we could not determine what happened to people who were no longer in the fee-for-service program. Among the most common reasons for people no longer being enrolled in Medicaid are death, imprisonment, no longer meeting eligibility standards, voluntarily giving up coverage, or moving out-of-state. Fourth, we lacked managed care data and thus were limited to the fee-for-service (and the PMHP) program. These shortcomings provide several opportunities for future research efforts. Finally, there have been a number of changes to the Florida Medicaid program during this time frame. It is unclear how the transition towards a Prepaid Mental Health Plan carve-out may have influenced the distribution of expenditures.

5. Conclusion

This study examined changes in Medicaid expenditures over a six year time period for individuals with a behavioral health diagnosis. Expenditures were higher in the first year for individuals with a behavioral health diagnosis than for individuals without a behavioral health diagnosis, and individuals with a behavioral health diagnosis were more likely to move to a higher expenditure group over time and be high cost cases in the sixth year. In addition, those with a behavioral health diagnosis were less likely to leave the Medicaid program. The results have implications for the implementation and potential cost effectiveness of case management interventions.

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