ORIGINAL ARTICLE

Ten-Year Trends in Quality of Care and Spending for Depression

1996 Through 2005

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Context: During the past decade, the introduction of generic versions of newer antidepressants and the release of Food and Drug Administration warnings regarding suicidality in children, adolescents, and young adults may have had an effect on cost and quality of depression treatment.

Objectives: To examine longitudinal trends in health service utilization, spending, and quality of care for depression.

Design: Observational trend study.

Setting: Florida Medicaid enrollees, between July 1, 1996, and June 30, 2006.

Patients: Annual cohorts aged 18 to 64 years diagnosed as having depression.

Main Outcome Measures: Mental health care spending (adjusted for inflation and case mix), as well as its components, including inpatient, outpatient, and medication expenditures. Quality-of-care measures included medication adherence, psychotherapy, and follow-up visits.

Results: Mental health care spending increased from a mean of $2802 per enrollee to $3610 during this period (29% increase). This increase occurred despite a mean decrease in inpatient spending from $641 per enrollee to $373 and was driven primarily by an increase in pharmacotherapy spending (up 110%), the bulk of which was due to spending on antipsychotics (949% increase). The percentage of enrollees with depression who were hospitalized decreased from 9.1% to 5.1%, and the percentage who received psychotherapy decreased from 56.6% to 37.5%. Antidepressant use increased from 80.6% to 86.8%, anxiety medication use was unchanged at 62.7% and 64.4%, and antipsychotic use increased from 25.9% to 41.9%. Changes in quality of care were mixed, with antidepressant use improving slightly, psychotherapy utilization fluctuating, and follow-up visits decreasing.

Conclusions: During a 10-year period, spending for Medicaid enrollees with depression increased substantially, with minimal improvements in quality of care. Antipsychotic use contributed significantly to the increase in spending, while contributing little to traditional measures of quality of care.

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Depression affects almost 1 in 5 adults in the United States during their lifetime[1] and has significant personal and societal costs.[2] Untreated depression is associated with significant clinical morbidity and worsens the morbidity of other chronic diseases.[3] Depression results in increased health care use and costs,[4,5] incurs significant emotional difficulties and lost work productivity,[6-8] and is linked to premature death.[9]

During the 1980s and 1990s, the number of adults diagnosed with and treated for depression increased, and the modality of treatment shifted. The percentage of adults with depression who received antidepressants increased, and the percentage who received psychotherapy or were hospitalized for depression decreased.[10] As a consequence of the shift away from psychotherapy and hospitalization, estimates of the mean cost per treated patient decreased.[11] The introduction of selective serotonin reuptake inhibitors and other new antidepressants (such as bupropion hydrochloride, venlafaxine hydrochloride, etc) contributed to these treatment trends. The newer medications have a lower incidence of potentially fatal adverse effects at high therapeutic levels and interactions with commonly consumed foods than previously available antidepressants and allowed primary care physicians to have a larger role in assessing and treating depression.[12] Despite the more common use of antidepressant medica-

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tions for depression, several studies[13-15] examining quality of depression treatment showed generally low performance throughout the 1990s.

In the past decade, multiple developments may have had an effect on spending and antidepressant use for the treatment of depression. Beginning in 1999, the selective serotonin reuptake inhibitors and other new antidepressants like bupropion began to come off patent, potentially lowering cost of care and further increasing use as generics became available.[16] The Food and Drug Administration approved new antidepressants for the treatment of depression, including escitalopram oxalate in 2002 and duloxetine hydrochloride in 2004, as well as multiple new formulations of previously approved medications (eg, extended-release bupropion). After gaining approval in 1997, direct-to-consumer advertising of antidepressants may have increased the acceptance and use of these medications.[17] In 2004, the Food and Drug Administration issued warnings about the increased risk of suicidal thoughts among children and young adults receiving treatment with selective serotonin reuptake inhibitors, likely decreasing the use of antidepressants in children, with some possible spillover to use in adult populations.[18]

In this study, we examined changes in depression health service utilization, spending, and quality of care between July 1, 1996, and June 30, 2006, in a Medicaid program from a large and diverse state (Florida). We addressed the following questions: (1) How have health service utilization trends changed over time? (2) How have the different components of mental health care spending (inpatient, outpatient, and pharmacotherapy) changed? (3) Has there been any improvement in the quality of depression care?

METHODS

DATA AND STUDY SAMPLE

We used administrative data (eligibility and claims files) from Florida's Medicaid program for fiscal years 1996 through 2005 (Florida's Medicaid fiscal year runs from July 1 to June 30). We restricted our analyses to these years because Florida moved large numbers of Medicaid enrollees into prepaid mental health plans that may not reliably report encounter data beginning in fiscal year 2006. Through fiscal year 2005, Florida's Medicaid program was primarily fee-for-service, had enrollment ranging from 2.1 to 2.9 million persons, and was the fourth largest in the United States.[19] Florida's Medicaid data include information on enrollees' age, sex, race/ethnicity, Medicaid eligibility category, clinical diagnoses, health service utilization (including pharmacotherapy), and spending.

We identified annual cohorts of adults with depression consisting of enrollees aged 18 to 64 years having 1 or more hospitalizations with a principal diagnosis of depression or having at least 2 outpatient claims of depression (*International Classification of Diseases, Ninth Revision, Clinical Modification* [*ICD-9-CM*] code 296.2, 296.3, 300.4, or 311) on different days.[15,20-23] A limitation of claims data is that there could be false-positives and false-negatives in establishing the cohort. Prior research has shown that using a less stringent algorithm for identifying depression in administrative data is associated with a high specificity (ie, low false-positive rates) but at the expense of sensitivity (ie, higher false-negative rates).[24] The implications of the use of this algorithm are that our cohort is likely to have few false-positive results but that many enrollees who may have depression were excluded from our cohort. For these individuals, we cannot say anything about their health service utilization or quality of care. Enrollees were excluded if they were enrolled for fewer than 10 months of the fiscal year or were enrolled through family planning services. In addition, enrollees were excluded if they were dually eligible for Medicare or were enrolled in a health maintenance organization or prepaid mental health plan at any time during the fiscal year because of the possibility of incomplete encounter data. We also excluded enrollees who received a diagnosis of schizophrenia (*ICD-9-CM* code 295) or bipolar disorder (*ICD-9-CM* codes 296.0-296.1, 296.4-296.8, or 301.13) during the fiscal year because we would expect their treatment patterns to be defined by their primary mental health diagnoses. A summary of these exclusions is given in eTable 1 (http://archgenpsychiatry.com).

PATIENT CHARACTERISTICS AND OUTCOME MEASURES

Results of patient characteristics, outcome measures, and statistical analyses were obtained separately within each fiscal year for each enrollee. Findings are presented as 2-year means to minimize year-to-year fluctuation.

Patient Characteristics

We used files from Florida Medicaid to identify enrollees' age, sex, race/ethnicity, and Medicaid eligibility category. For race/ethnicity, we combined Hispanic and other race/ethnicity categories, because before 1999, enrollees who were eligible for Medicaid via Supplemental Security Income only were included in race/ethnicity categories of black, white, and other.[25,26] We identified the following 4 subtypes of depression (*ICD-9-CM* codes): major depressive disorder with psychosis (codes 296.24 and 296.34), major depressive disorder without psychosis (codes 296.20-296.23, 296.25-296.26, 296.30-296.33, and 296.35-296.36), and other depression, which includes depression disorder not otherwise specified (code 311) and dysthymia (code 300.4). We assigned 1 of 4 subtypes to each enrollee with depression via the hierarchy already given. In other words, if an enrollee had claims for both other depression and major depressive disorder without psychosis, we identified that enrollee as having major depressive disorder without psychosis. We identified individuals having comorbid anxiety or adjustment disorder (codes 300.0-300.3, 300.5-300.9, and 308.0-309.9), comorbid substance use disorders (codes 291-292 and 303-305), or other comorbid mental health condition (codes 290-319, excluding the aforelisted diagnoses) if they had at least 1 *ICD-9-CM* code indicating the condition within the fiscal year. In addition, because of the high levels of physical comorbidity in depression, we identified individuals having the following comorbid physical illness, defined as the presence of relevant *ICD-9-CM* codes for 1 or more of the following: human immunodeficiency virus or AIDS, diabetes mellitus, hypertension, back or joint pain, and chronic obstructive pulmonary disease or asthma. These conditions were chosen because they were the most common chronic medical conditions in our cohort. We identified individuals being treated by a psychiatrist if they had 1 or more claims submitted by a psychiatrist during the fiscal year.

Health Service Utilization and Spending Measures

We examined the proportions of enrollees with depression who had an inpatient hospitalization, psychotherapy visits, or pharmacotherapy with antidepressants or other mental health medi-

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cation classes. We examined medication class utilization by depression type. Numerators were defined as the number of enrollees who received the health service for the given year, and denominators were defined as the total number of eligible enrollees with depression.

We tabulated the total annual health care spending and the mental health care spending for each enrollee. We categorized mental health care spending as inpatient, outpatient, or pharmacotherapy expenditures. For each category, we summed the amount paid in claims. For enrollees who were enrolled for only 10 or 11 months of the fiscal year, we annualized the claims. Using the southern region medical care component of the consumer price index, we adjusted the dollar amounts to fiscal year 2005 US dollars.

We classified a claim as being for mental health if it met any of the following criteria: (1) the procedure code was mental health specific, (2) the place of service was mental health specific, (3) a mental health diagnosis was present, or (4) the provider was a mental health specialist. Claims were then categorized as inpatient, outpatient, or pharmacotherapy expenditures. Inpatient stays included only admissions with a mental health diagnosis reported as the primary diagnosis. Any mental health claims that occurred during the period of hospitalization were included in the inpatient claims. We further categorized outpatient spending as psychotherapy, other physician or clinic visits, and other outpatient services (eg, case management, treatment planning, psychosocial rehabilitation, day treatment programs, laboratory testing, and other outpatient wraparound services). Claims that included coding for both psychotherapy and pharmacotherapy (eg, *ICD-9-CM* codes 90805, 90807, and 90809) were categorized as psychotherapy for the spending and health service utilization measures. Mental health pharmacotherapy claims were examined in aggregate and by mental health medication class. Medication classes examined included antidepressants, antipsychotics, antianxiety medications, and other mental health medications (the specific classification is given in Appendix).

Quality-of-Care Measures

Published guidelines recommend treatment during both acute-phase and continuation-phase episodes.[27] In this study, we focus on acute-phase measures. We identified individuals from our cohort having a new acute-phase episode of depression if they entered outpatient treatment with no previous claims for mental health diagnoses for the previous 120 days and no antidepressant claims between 31 and 120 days before the initial diagnosis (given that some patients may receive medication before actually seeing the physician) or if they were discharged from an inpatient hospitalization with a principal diagnosis of depression.

We defined acute-phase episodes as lasting 112 days (16 weeks). We used this period to accommodate response to treatment and inefficiencies that can occur in usual care. The index date of the acute-phase episode was defined as the date of the first depression diagnosis or the first day after discharge from the hospital. Our quality-of-care measures are informed by prior research and published guidelines. For individuals who filled an antidepressant prescription within 30 days of the index date, we defined adequate drug treatment as receiving 75% or more days of antidepressant use from the first antidepressant fill to the end of the acute-phase episode[28,29] and adequate follow-up as 3 or more follow-up visits during the acute-phase episode.[30] For individuals who received psychotherapy within 30 days of the index date, we defined minimally adequate psychotherapy as 4 or more visits during the acute-phase episode, based on previous studies.[13,21,31,32] Finally, for individuals being discharged from a psychiatric hospitalization for depression, we defined the following 2 measures to examine adequate follow-up visits: the receipt of an ambulatory mental health visit within 7 days or 30 days of hospital discharge (based on measures in the Healthcare Effectiveness Data and Information Set). Numerators for these quality end points were the number of eligible acute-phase episodes that met the definitions already given, and denominators were the number of eligible acute-phase episodes. Individuals who were not continuously enrolled for the acute-care episode were excluded (5.5%), as were individuals who were hospitalized during the acute-care episode (6.8%). Episodes that spanned fiscal years were included in the fiscal year of the index date.

STATISTICAL ANALYSIS

We first described the demographic characteristics of enrollees identified as having depression for the first 2 and last 2 fiscal years of the 10-year period studied. We compared changes in demographic characteristics using the χ^2 test for categorical data and the *t* test for continuous data.

We then examined unadjusted trends in health service utilization, spending, and quality of care during the 10-year study period. We report trends over 10 years in the mean total health care spending, mental health care spending, mental health component spending, and pharmacotherapy spending by mental health medication class. We calculated the percentage increase in spending after combining the first 2 and last 2 fiscal years of the 10-year period studied to minimize the effect of year-to-year fluctuation. As a supplement to unadjusted spending data, we adjusted each spending category for changes in underlying demographics (age, sex, race/ethnicity, and Medicaid eligibility category) and medical and psychiatric comorbidities using a linear generalized estimating equation clustered on individuals to estimate spending.[33] We present the percentage of the unadjusted changes that are attributed to demographic changes over time, as well as the remaining contributions of each spending category, adjusted for changing demographics. Finally, we describe trends in quality of care and test for trends using the Cochran-Armitage trend test.

RESULTS

The number of enrollees with depression identified annually varied from 8970 to 13 265, with more enrollees identified toward the end of our study period. The rate of identified depression remained constant and was 5.6% in fiscal years 1996 and 1997 and 5.7% in fiscal years 2004 and 2005. Many enrollees were identified in more than 1 annual cohort. The total number of unique individuals identified with depression in our study period was 56 805. There were 107 931 observations over 10 years. Demographically, the racial/ethnic makeup of our sample changed during the study period to include a larger proportion of patients with identified depression who are of Hispanic or other race/ethnicity (**Table 1**). This change in demographics likely reflects the change in the Social Security Administration's definition of race/ethnicity and an increase in the Hispanic population in Florida.[34,35] The percentage of our sample who had major depressive disorder with psychosis increased over this period. In addition, the percentage who had other forms of depression increased but remained a small portion. The percentage of our sample who had comorbid anxiety or adjustment disorder diagnoses decreased, and the per-

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Table 1. Characteristics of Florida Medicaid Enrollees With Identified Depression in FYs 1996 and 1997 vs in FYs 2004 and 2005[a]

Variable	FYs 1996 and 1997 (n = 18 663)	FYs 2004 and 2005 (n = 24 312)	*P* Value
Age, mean (SD), y	43.5 (12.4)	44.5 (13.1)	<.001
Sex, %			
Male	22.6	23.9	.01
Female	77.4	76.1	
Race/ethnicity, %			
White	50.6	42.4	<.001
Black	13.3	13.7	
Hispanic or other	36.1	44.1	
Medicaid eligibility category, %			
Supplemental Security Income	69.5	67.5	<.001
AFDC or TANF	23.6	21.2	
Other	6.8	11.3	
Depression subtype, %			
MDD with psychosis	15.2	21.2	<.001
MDD without psychosis	84.3	74.3	<.001
Other depression[b]	<0.4	4.5	<.001
Mental health comorbidity, %			
Anxiety or adjustment disorder	36.5	30.5	<.001
Substance use disorder	10.5	17.5	<.001
Other	9.8	10.2	.18
Physical comorbidity, %			
Human immunodeficiency virus or AIDS	4.6	4.5	.16
Diabetes mellitus	12.2	20.3	<.001
Hypertension	24.2	38.7	<.001
Back or joint pain	44.0	52.5	<.001
Chronic obstructive pulmonary disease or asthma	25.0	29.3	<.001
Treated by a psychiatrist, %	82.8	72.3	<.001

Abbreviations: AFDC, Aid to Families With Dependent Children; FYs, fiscal years; MDD, major depressive disorder; TANF, Temporary Assistance for Needy Families.

[a] Observations refer to data on a person-year basis. In FY 1996, there were 9662 observations, and in FY 1997 there were 9001 observations. Forty-two percent of patients in FY 1996 were also in FY 1997. In FY 2004, there were 13 265 observations, and in FY 2005 there were 11 047 observations. Thirty-nine percent of patients in FY 2004 were also in FY 2005. Data may not total 100% due to rounding

[b] Includes depression disorder not otherwise specified and dysthymia.

centage with substance use disorders increased. Except for human immunodeficiency disorder or AIDS, all other physical comorbidities increased during this time. The percentage of enrollees with depression treated by a psychiatrist decreased over this period.

HEALTH SERVICE UTILIZATION

During the period studied, the percentage of enrollees with depression who received psychotherapy decreased from 56.6% to 37.5%, and the percentage who were hospitalized decreased from 9.1% to 5.1% (data not shown). In contrast, the percentages of enrollees with depression who filled prescriptions within any mental health medication classes remained the same (antianxiety medications) or increased (antidepressants, antipsychotics, and other mental health medications) during this period (**Table 2**). Trends were similar for all subtypes of depression. Of particular note are the increases in antipsychotic use for all subtypes of depression, not just major depressive disorder with psychosis.

SPENDING

After adjusting for inflation, demographics, and medical and psychiatric comorbidities, spending for mental health treatment increased 29% during the study period, from $2802 to $3610 (**Table 3**). Spending for inpatient mental health care decreased 42%, while spending for outpatient visits increased 21%. Spending for other physician or clinic visits and other outpatient services increased more than spending for psychotherapy.

Spending on mental health pharmacotherapy increased 110% during the 10 years studied (Table 3). Spending for antidepressants increased 22% over the 10-year period and peaked in fiscal years 2000 and 2001. Spending on antianxiety medications decreased substantially during the study period despite no change in their use. By contrast, spending on antipsychotics (up 949%) and other mental health medication classes (up 328%) increased dramatically. By the end of the 10-year period, the mean spending on antipsychotics ($860) surpassed the mean spending on antidepressants ($557). Among antipsychotics, spending on quetiapine fumarate was greatest, followed by risperidone.

Compared with unadjusted data, adjusting for patients' demographic and clinical characteristics decreased the change in total mental health care spending from $1134 to $808 (Table 3 and eTable 2). Spending on inpatient, outpatient, and pharmacotherapy expenditures shows similar patterns between adjusted and unadjusted estimates. The increase in antipsychotic use seemed to contribute most to increased spending for mental health care, and the decrease in inpatient spending

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Table 2. Proportions of Florida Medicaid Enrollees Using Mental Health Medication Classes by Depression Subtype

Variable	% (95% CI) FYs 1996 and 1997	% (95% CI) FYs 2004 and 2005	*P* Value
Antidepressants			
All enrollees with depression	80.6 (80.0-81.2)	86.8 (86.4-87.3)	<.001
MDD with psychosis	86.5 (85.2-87.7)	92.2 (91.5-93.0)	<.001
MDD without psychosis	80.6 (80.0-81.3)	86.5 (86.0-87.0)	<.001
Other depression	47.4 (36.1-58.8)	75.7 (73.1-78.2)	<.001
Antipsychotics			
All enrollees with depression	25.9 (25.3-26.5)	41.9 (41.3-42.6)	<.001
MDD with psychosis	61.8 (60.0-63.6)	78.8 (77.7-80.0)	<.001
MDD without psychosis	19.8 (19.2-20.5)	32.9 (32.2-33.6)	<.001
Other depression	9.0 (2.5-15.5)	19.6 (17.2-22.0)	.02
Antianxiety medications			
All enrollees with depression	62.7 (62.0-63.0)	64.4 (64.0-65.0)	<.001
MDD with psychosis	69.4 (67.7-71.1)	77.3 (76.2-78.5)	<.001
MDD without psychosis	62.5 (61.7-63.2)	62.3 (61.6-63.0)	.73
Other depression	20.5 (11.3-29.7)	41.8 (38.9-44.8)	<.001
Other mental health medications			
All enrollees with depression	15.6 (15.1-16.1)	26.9 (26.4-27.5)	<.001
MDD with psychosis	15.5 (14.2-16.9)	22.3 (21.2-23.5)	<.001
MDD without psychosis	15.8 (15.3-16.4)	28.6 (28.0-29.3)	<.001
Other depression	7.7 (1.6-14.7)	17.8 (15.5-20.0)	.02

Abbreviations: FYs, fiscal years; MDD, major depressive disorder.

Table 3. Trends in Mental Health Care Spending per Florida Medicaid Enrollee With Identified Depression Over 10 Years

Variable	Mean (95% CI), $ FYs 1996 and 1997	Mean (95% CI), $ FYs 2000 and 2001	Mean (95% CI), $ FYs 2004 and 2005	Change From FYs 1996 and 1997 to FYs 2004 and 2005: Adjusted[a] Increase,%	Adjusted[a] Difference,$	Unadjusted Difference, $
Mental health care	2802 (2791-2813)	3763 (3282-3303)	3610 (3599-3621)	29	808	1134
Inpatient	641 (637-645)	567 (563-572)	373 (369-378)	–42	–268	–179
Outpatient	1267 (1261-1274)	1594 (1587-1600)	1509 (1502-1515)	21	242	474
Psychotherapy	146 (145-146)	123 (123-124)	150 (150-150)	3	4	7
Other physician or clinic visits	174 (174-174)	225 (225-226)	214 (213-214)	23	40	42
Other outpatient services	945 (939-952)	1237 (1231-1244)	1133 (1127-1140)	20	188	425
Pharmaceuticals	840 (838-843)	1580 (1577-1583)	1768 (1765-1771)	110	928	880
Antidepressants	457 (456-458)	675 (674-676)	557 (556-558)	22	100	70
Antipsychotics	82 (80-84)	494 (493-496)	860 (859-862)	949	778	716
Antianxiety medications	161 (161-161)	226 (225-226)	89 (88-89)	–45	–72	–88
Other mental health medication classes	61 (61-62)	187 (186-187)	261 (261-262)	328	200	192

Abbreviation: FYs, fiscal years.
[a] Estimates adjusted for age, sex, race/ethnicity, Medicaid eligibility category, mental health comorbidities, and physical comorbidities using a linear generalized estimating equation clustered on individuals with exchangeable correlation. Annualized estimates and US dollar amounts are consumer price index–adjusted to fiscal year 2005. Unadjusted estimates are given in eTable 2.

seemed to contribute most to decreased overall mental health care spending (**Figure**).

QUALITY OF CARE

We identified 2523 outpatient acute phases in fiscal years 1996 and 1997, with 2836 in fiscal years 2000 and 2001 and 3017 in fiscal years 2004 and 2005 (**Table 4**). The percentage of acute-phase episodes that were treated with antidepressants increased from 65.1% to 75.2% during this 10-year period. In contrast, the percentage of acute-phase episodes that were treated with psychotherapy decreased from 42.6% to 26.9%.

Among patients who received pharmacotherapy, the proportion who received minimally adequate drug treatment increased slightly over time from 58.7% to 68.2% ($P<.01$), and the proportion who received minimally adequate follow-up visits decreased from 19.4% to 10.9% ($P<.01$) (Table 4). Among outpatients who received psychotherapy, the proportion who received at least 4 sessions within the acute phase fluctuated between 9.5% and 14.3% ($P=.35$).

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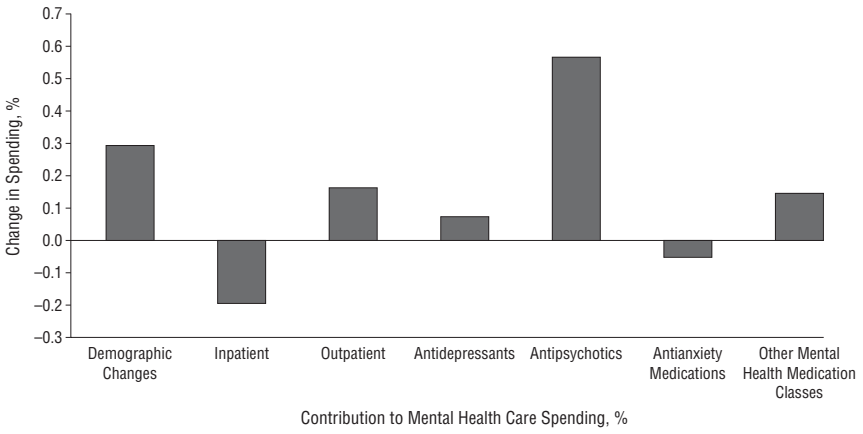

Figure. Contributions of demographic changes and mental health care components to increases in mental health care spending in Florida Medicaid from fiscal years 1996 and 1997 to fiscal years 2004 and 2005. Data are adjusted for demographic factors, mental health comorbidities, and physical comorbidities.

Table 4. Trends in Depression Quality of Care Among Florida Medicaid Enrollees Over 10 Years

Variable	No. (%)			*P* Value for Trend[a]
	FYs 1996 and 1997	FYs 2000 and 2001	FYs 2004 and 2005	
Outpatient	2523 (NA)	2836 (NA)	3017 (NA)	
Pharmacotherapy	1643 (65.1)	2069 (73.0)	2268 (75.2)	<.01
Psychotherapy	1075 (42.6)	930 (32.8)	812 (26.9)	<.01
Outpatient Acute-Phase Quality Measures				
Pharmacotherapy[b]				
Minimally adequate treatment	965 (58.7)	1333 (64.4)	1546 (68.2)	<.01
Minimally adequate follow-up visits	319 (19.4)	304 (14.7)	247 (10.9)	<.01
Minimally adequate psychotherapy[c]	154 (14.3)	88 (9.5)	108 (13.3)	.35
Posthospitalization	1028 (NA)	1310 (NA)	1252 (NA)	
Pharmacotherapy	778 (75.7)	1021 (77.9)	934 (74.6)	.47
Psychotherapy	332 (32.3)	291 (21.6)	233 (18.6)	<.01
Posthospitalization Acute-Phase Quality Measures				
Pharmacotherapy[b]				
Minimally adequate treatment	323 (41.5)	528 (51.7)	455 (48.7)	<.01
Minimally adequate follow-up visits	275 (35.3)	316 (31.0)	281 (30.1)	.02
Minimally adequate psychotherapy[c]	90 (27.1)	66 (22.6)	86 (36.9)	.02
Posthospitalization follow-up visit[d]				
Within 7 d	152 (14.7)	188 (14.3)	203 (16.2)	.32
Within 30 d	354 (34.4)	416 (31.7)	413 (32.9)	.51

Abbreviations: FYs, fiscal years; NA, not applicable.
[a] Two-sided Cochran-Armitage trend test.
[b] Denominator is the number of acute-phase episodes that received pharmacotherapy.
[c] Denominator is the number of acute-phase episodes that received psychotherapy.
[d] Denominator is the number of posthospitalization acute-phase quality measures: 1028 for FYs 1996 and 1997, with 1310 for FYs 2000 and 2001 and 1252 for FYs 2004 and 2005. During the acute-phase period, individuals who received antidepressants had minimally adequate treatment if they filled an antidepressant prescription for 75% of the days and had minimally adequate follow-up visits if they had 3 or more health provider visits. Individuals who received psychotherapy had minimally adequate psychotherapy if they had 4 or more visits. Posthospitalization individuals had minimally adequate follow-up visits if they had a visit with a mental health provider within 14 days after hospital discharge.

We identified 1028 posthospitalization acute phases in fiscal years 1996 and 1997 with 1310 in fiscal years 2000 and 2001 and 1252 in fiscal years 2004 and 2005 (Table 4). The proportion of acute phases that included antidepressant use within 30 days of discharge did not change significantly during the 10 years studied. The proportion of acute phases that included psychotherapy use decreased from 32.3% to 18.6% ($P<.01$).

Among posthospitalization acute phases that included antidepressant use, the proportion with minimally adequate drug treatment increased from 41.5% to 48.7% ($P<.01$), and the proportion with minimally adequate follow-up visits decreased slightly from 35.3% to 30.1% ($P=.02$) (Table 4). The proportion of posthospitalization acute phases that included 4 or more sessions of psychotherapy during the acute phase fluctuated between 22.6% and 36.9% during the

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period studied ($P = .02$). Finally, the proportion of post-hospitalization acute phases that included a follow-up visit within 7 days or 30 days remained low, with no significant trend. An examination of continuation-phase measures showed similar trends of an increase in antidepressant use, with no significant change in minimally adequate follow-up visits (eTable 3).

COMMENT

We examined treatment of patients with depression, including health care spending and quality of care, in Florida Medicaid between 1996 and 2005 and had 4 notable findings. First, there was a 29% increase in mental health care spending per enrollee with depression, after adjusting for inflation and changes in patients' demographic and clinical characteristics. Second, this increase occurred despite decreases in inpatient costs per enrollee. Third, spending on pharmacotherapy increased by 110%, with the bulk of that increase due to antipsychotic use rather than antidepressant use. Fourth, despite the increased expenditures, there were mixed changes in the quality-of-care measures that we studied: antidepressant use improved slightly over the 10-year period, psychotherapy utilization fluctuated, and follow-up visits decreased.

Because of prior trends showing reductions in the use of inpatient services and psychotherapy, as well as the introduction of generic newer-generation antidepressants, we expected to find decreasing expenditures per enrollee with depression. Nevertheless, we found the opposite, with increasing use of antipsychotics being the largest contributor to rising costs. Because our sample does not include individuals with comorbid schizophrenia or bipolar disorder, this increase in antipsychotic use is particularly notable.

During the period of this study, the use of adjunctive antipsychotics was recommended for the small portion of patients with depression who also experience psychotic symptoms[36] and as one of several augmentation strategies for individuals with limited or poor response to antidepressants alone.[37] Antipsychotics may also have been used off label to treat anxiety[38] or insomnia,[39] particularly in those for whom alternative treatments may not be appropriate (eg, benzodiazepines in patients with substance use disorders). Our data show an increase in antipsychotic use within all subtypes of depression. Furthermore, one would expect the more recent Food and Drug Administration approvals of aripiprazole (2007) and quetiapine extended-release tablets (2009) as adjunctive treatment to antidepressants for major depressive disorder to accelerate this trend.

In our adjusted analyses, we controlled for comorbid substance use disorders and anxiety or adjustment disorder; therefore, it seems unlikely that changes in clinical case mix accounts for the widespread (and growing) use of antipsychotics in patients who are being treated for depression. Our results are consistent with other research finding that the introduction of atypical antipsychotics has expanded the indications for which antipsychotics are prescribed.[40] Given the risk of metabolic adverse effects associated with several of the atypical antipsychotics,[41] including the most commonly used antipsychotics in this study, the large effect this use has on potential morbidity and on costs of care underscores the need for the development of targeted guidelines to address antipsychotic use for individuals with depression, as well as cost-effectiveness studies examining antipsychotic use in treatment-resistant depression.

The juxtaposition of increased mental health care spending per enrollee without a substantial improvement in depression quality of care is striking. Although public reporting of quality measures has led to greater improved performance for many aspects of care, quality performance for depression has improved more slowly and remains less than optimal. In general, Medicaid enrollees receive lower-quality care,[42] as do individuals with severe mental illness.[43] Factors affecting the quality of care for depression can be classified into informational and attitudinal variables, financial barriers, and lack of profitability.[44] Our data suggest gains in acceptance of antidepressant and antipsychotic treatment by patients and providers, potentially reflecting the effective marketing of both types of medications by pharmaceutical companies. Despite these gains, the receipt of quality measures for depression remained low. This study does not explore the reasons for this ceiling. Results of past studies[45,46] have suggested that individuals may view treatment of mental illness as less important than physical illness and may fear mental health medications as being addictive and possibly interfering with natural emotions. Collaborative care models have been identified as one of the most effective approaches to improving quality of depression care and outcomes[47]; however, the diffusion of this model has remained limited, partially as a result of the limited funding for costs related to these models.[48] Finally, the small rise in antidepressant spending could correspond to longer periods of treatment with antidepressants, as has been shown in other research[49]; however, this change would not be reflected in the quality measures examining acute episodes of depression or in simple rates of utilization.

To our knowledge, this study is the first to focus simultaneously on changes over time in health service utilization, spending, and quality of care for patients with depression. Although findings from prior studies[11,50] have examined spending up to 2007, they have not examined changes in cost per person past 2000 or by individual drug classes. Our results are consistent with prior studies[11,51,52] of overall mental health care spending showing higher expenditures for pharmacotherapy and lower expenditures for inpatient care. Past studies[53,54] focusing on the use of antidepressants and other psychoactive medications through 2005 have documented increased use of antidepressants, increased use of antipsychotics for patients taking antidepressants, and decreased use of psychotherapy for patients taking antidepressants. Unlike our study, these studies did not look specifically at a population of patients with depression. Our longitudinal results of little change in quality of depression care are consistent with prior investigations in the Veterans Administration system[55] and with limited changes in national Healthcare Effectiveness Data and Information Set measures over time.[56,57] Our findings of increased use of

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medications coupled with similar or decreased use of mental health visits or psychotherapy are also consistent with literature documenting utilization trends for depression[50] and for other psychiatric illnesses.[58-60]

There are several limitations to this study. Our claims data include information on diagnoses and health services for patients who have been identified and treated for depression. They do not reflect population prevalence of depression because many individuals in the population may go undiagnosed and not be reflected in claims data. Our quality measures were based on process measures derived from guidelines and prior research; however, we were unable to assess patient outcomes. As a result, we could not determine whether the increased use of antipsychotics in patients with depression was associated with improved outcomes. Also, our costs reflect total mental health and substance abuse costs for the year, and we did not attempt to separate out costs attributable to psychiatric comorbidities. We thought that the strength of using an observational sample was the ability to capture total spending associated with depression care, which may include spending on comorbid diagnoses. For example, if an individual was being treated for anxiety or substance use and then received a diagnosis of depression a month later, it would be difficult to parse out what elements of the previous spending were related to anxiety, substance use, or depression. Furthermore, we controlled for changes in prevalence of comorbidities in the model. There is a possibility that during the 10 years studied, coding completeness or upcoding of data occurred at different rates. To our knowledge, there were no changes in Florida Medicaid policy that would have incentivized upcoding, and we mitigated this issue to the extent possible by examining only fee-for-service enrollees and categories of spending.

Our analysis stops in June 2006 (the end of fiscal year 2005) and may not accurately reflect current practice. Since this time, more drugs similar to previous drug classes have been approved (desvenlafaxine succinate and bupropion), as well as a new medication class (vilazodone). Furthermore, the availability of generics continues to increase. Concurrent release of new antidepressant formulations with the release of more generic versions of existing antidepressants also occurred during our study period. In addition, the Food and Drug Administration has approved 2 atypical antipsychotics for adjunctive use in treatment-resistant depression since this study. We would anticipate that this development could accelerate the trends in antipsychotic use and spending that we observed in this study.

Finally, we have data from only a single state, and the Medicaid enrollees in our study may not be representative of those in other Medicaid programs or of privately insured patients given their high levels of disability, comorbidity, and low socioeconomic status. Studies have shown that Medicaid enrollees have higher rates of depression[61] and antipsychotic use[62] compared with commercially insured populations. At the same time, Medicaid enrollees often receive lower quality of care over a range of quality measures.[42] Therefore, these results may overstate national trends in spending and medication use, while understating trends in quality metrics. Nonetheless, examining spending and quality of care within the fourth largest Medicaid population is important, as public insurance continues to cover a greater percentage of mental health and substance abuse costs over time and is anticipated to further expand under the 2009 Patient Protection and Affordable Care Act.[52,63,64]

In summary, during the 10-year period between 1996 and 2005, we found a substantial increase in spending for patients with depression, with minimal improvements in quality of care. Much of the increased spending was owing to pharmacotherapy, especially the use of antipsychotics. Our findings underscore the importance of continued efforts to improve quality of care for individuals with depression, as well as the need to understand the efficacy and cost-effectiveness of using antipsychotics for the treatment of individuals with depression in the general community.

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REFERENCES

1. Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters EE. Lifetime prevalence and age-of-onset distributions of *DSM-IV* disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry*. 2005;62(6):593-602.
2. Murray CJL, Lopez AD. *The Global Burden of Disease: A Comprehensive Assessment of Mortality and Disability From Diseases, Injuries, and Risk Factors in 1990 and Projected to 2020*. Cambridge, MA: Harvard University Press; 1996.
3. Wells KB, Stewart A, Hays RD, Burnam MA, Rogers W, Daniels M, Berry S, Greenfield S, Ware J. The functioning and well-being of depressed patients: results from the Medical Outcomes Study. *JAMA*. 1989;262(7):914-919.
4. Druss BG, Rosenheck RA, Sledge WH. Health and disability costs of depressive illness in a major U.S. corporation. *Am J Psychiatry*. 2000;157(8):1274-1278.
5. Simon GE, VonKorff M, Barlow W. Health care costs of primary care patients with recognized depression. *Arch Gen Psychiatry*. 1995;52(10):850-856.
6. Broadhead WE, Blazer DG, George LK, Tse CK. Depression, disability days, and days lost from work in a prospective epidemiologic survey. *JAMA*. 1990;264(19):2524-2528.
7. Berndt ER, Koran LM, Finkelstein SN, Gelenberg AJ, Kornstein SG, Miller IM, Thase ME, Trapp GA, Keller MB. Lost human capital from early-onset chronic depression. *Am J Psychiatry*. 2000;157(6):940-947.
8. Stewart WF, Ricci JA, Chee E, Hahn SR, Morganstein D. Cost of lost productive work time among US workers with depression. *JAMA*. 2003;289(23):3135-3144.
9. Bruce ML, Leaf PJ, Rozal GP, Florio L, Hoff RA. Psychiatric status and 9-year mortality data in the New Haven Epidemiologic Catchment Area Study. *Am J Psychiatry*. 1994;151(5):716-721.
10. Olfson M, Marcus SC, Druss BG, Elinson L, Tanielian T, Pincus HA. National trends in the outpatient treatment of depression. *JAMA*. 2002;287(2):203-209.
11. Greenberg PE, Kessler RC, Birnbaum HG, Leong SA, Lowe SW, Berglund PA, Corey-Lisle PK. The economic burden of depression in the United States: how did it change between 1990 and 2000? *J Clin Psychiatry*. 2003;64(12):1465-1475.

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12. Wang PS, Demler O, Olfson M, Pincus HA, Wells KB, Kessler RC. Changing profiles of service sectors used for mental health care in the United States. *Am J Psychiatry*. 2006;163(7):1187-1198.
13. Young AS, Klap R, Sherbourne CD, Wells KB. The quality of care for depressive and anxiety disorders in the United States. *Arch Gen Psychiatry*. 2001;58(1): 55-61.
14. Wang PS, Lane M, Olfson M, Pincus HA, Wells KB, Kessler RC. Twelve-month use of mental health services in the United States: results from the National Comorbidity Survey Replication. *Arch Gen Psychiatry*. 2005;62(6):629-640.
15. Charbonneau A, Rosen AK, Ash AS, Owen RR, Kader B, Spiro A III, Hankin C, Herz LR, Pugh MJV, Kazis L, Miller DR, Berlowitz DR. Measuring the quality of depression care in a large integrated health system. *Med Care*. 2003;41(5): 669-680.
16. Chen Y, Kelton CM, Jing Y, Guo JJ, Li X, Patel NC. Utilization, price, and spending trends for antidepressants in the US Medicaid program. *Res Social Adm Pharm*. 2008;4(3):244-257.
17. Donohue JM, Berndt ER, Rosenthal M, Epstein AM, Frank RG. Effects of pharmaceutical promotion on adherence to the treatment guidelines for depression. *Med Care*. 2004;42(12):1176-1185.
18. Libby AM, Orton HD, Valuck RJ. Persisting decline in depression treatment after FDA warnings. *Arch Gen Psychiatry*. 2009;66(6):633-639.
19. Centers for Medicare and Medicaid Services, Office of Research Development and Information, Mathematica Policy Research. The Medicaid Analytic eXtract (MAX) Chartbook. https://www.cms.gov/medicaiddatasourcesgeninfo/07_maxgeneralinformation.asp. Accessed September 8, 2011.
20. Kniesner TJ, Powers RH, Croghan TW. Provider type and depression treatment adequacy. *Health Policy*. 2005;72(3):321-332.
21. Katon WJ, Richardson L, Russo J, Lozano P, McCauley E. Quality of mental health care for youth with asthma and comorbid anxiety and depression. *Med Care*. 2006; 44(12):1064-1072.
22. Sewitch MJ, Blais R, Rahme E, Bexton B, Galarneau S. Receiving guideline-concordant pharmacotherapy for major depression: impact on ambulatory and inpatient health service use. *Can J Psychiatry*. 2007;52(3):191-200.
23. Busch AB, Huskamp HA, Normand SL, Young AS, Goldman HH, Frank RG. The impact of parity on major depression treatment quality in the Federal Employees' Health Benefits Program after parity implementation. *Med Care*. 2006; 44(6):506-512.
24. Spettell CM, Wall TC, Allison J, Calhoun J, Kobylinski R, Fargason R, Kiefe CI. Identifying physician-recognized depression from administrative data: consequences for quality measurement. *Health Serv Res*. 2003;38(4):1081-1102.
25. Arday SL, Arday DR, Monroe S, Zhang J. HCFA's racial and ethnic data: current accuracy and recent improvements. *Health Care Financ Rev*. 2000;21(4):107-116.
26. Scott CG. Identifying the race or ethnicity of SSI recipients. *Soc Secur Bull*. 1999; 62(4):9-20.
27. Fochtmann IJ, Gelenberg AJ. *Guideline Watch: Practice Guideline for the Treatment of Patients With Major Depressive Disorder*. 2nd ed. Arlington, VA: American Pyshicatric Association; 2005.
28. Charbonneau A, Rosen AK, Owen RR, Spiro A III, Ash AS, Miller DR, Kazis L, Kader B, Cunningham F, Berlowitz DR. Monitoring depression care: in search of an accurate quality indicator. *Med Care*. 2004;42(6):522-531.
29. Rost K, Dickinson LM, Fortney JC, Westfall J, Hermann RC. Clinical improvement associated with conformance to HEDIS-based depression care. *Ment Health Serv Res*. 2005;7(2):103-112.
30. Wells KB, Sturm R. Care for depression in a changing environment. *Health Aff (Millwood)*. 1995;14(3):78-89.
31. Schoenbaum M, Unützer J, McCaffrey D, Duan N, Sherbourne C, Wells KB. The effects of primary care depression treatment on patients' clinical status and employment. *Health Serv Res*. 2002;37(5):1145-1158.
32. Katon WJ, Simon GE, Russo J, Von Korff M, Lin EHB, Ludman E, Ciechanowski P, Bush T. Quality of depression care in a population-based sample of patients with diabetes and major depression. *Med Care*. 2004;42(12):1222-1229.
33. Zeger SL, Liang KY. Longitudinal data analysis for discrete and continuous outcomes. *Biometrics*. 1986;42(1):121-130.
34. US Census Bureau. Current Population Survey table creator. http://www.census.gov/hhes/www/cpstc/cps_table_creator.html. Accessed October 5, 2010.
35. US Census Bureau. Population estimates for states by race and Hispanic origin: July 1, 1996. http://www.census.gov/popest/archives/1990s/strh/srh96.txt. Accessed October 5, 2010.
36. American Psychiatric Association. Practice guideline for the treatment of patients with major depressive disorder (revision). *Am J Psychiatry*. 2000;157 (4)(suppl):1-45.
37. Labbate LA, Fava M, Rosenbaum JF, Arana GW. *Handbook of Psychiatric Drug Therapy*. 6th ed. New York, NY: Lippincott, Williams & Wilkins; 2009.
38. Leslie DL, Mohamed S, Rosenheck RA. Off-label use of antipsychotic medications in the Department of Veterans Affairs health care system. *Psychiatr Serv*. 2009;60(9):1175-1181.
39. Philip NS, Mello K, Carpenter LL, Tyrka AR, Price LH. Patterns of quetiapine use in psychiatric inpatients: an examination of off-label use. *Ann Clin Psychiatry*. 2008;20(1):15-20.
40. Alexander GC, Gallagher SA, Mascola A, Moloney RM, Stafford RS. Increasing off-label use of antipsychotic medications in the United States, 1995-2008. *Pharmacoepidemiol Drug Saf*. 2011;20(2):177-184.
41. Newcomer JW. Metabolic considerations in the use of antipsychotic medications: a review of recent evidence. *J Clin Psychiatry*. 2007;68(suppl 1):20-27.
42. Landon BE, Schneider EC, Normand SL, Scholle SH, Pawlson LG, Epstein AM. Quality of care in Medicaid managed care and commercial health plans. *JAMA*. 2007;298(14):1674-1681.
43. Druss BG, Bradford WD, Rosenheck RA, Radford MJ, Krumholz HM. Quality of medical care and excess mortality in older patients with mental disorders. *Arch Gen Psychiatry*. 2001;58(6):565-572.
44. Drake R, Skinner J, Goldman HH. What explains the diffusion of treatments for mental illness? *Am J Psychiatry*. 2008;165(11):1385-1392.
45. Kadam UT, Croft P, McLeod J, Hutchinson M. A qualitative study of patients' views on anxiety and depression. *Br J Gen Pract*. 2001;51(466):375-380.
46. Zivin K, Kales HC. Adherence to depression treatment in older adults: a narrative review. *Drugs Aging*. 2008;25(7):559-571.
47. Gilbody S, Bower P, Fletcher J, Richards D, Sutton AJ. Collaborative care for depression: a cumulative meta-analysis and review of longer-term outcomes. *Arch Intern Med*. 2006;166(21):2314-2321.
48. Katon WJ, Zatzick D, Bond G, Williams J Jr. Dissemination of evidence-based mental health interventions: importance to the trauma field. *J Trauma Stress*. 2006;19(5):611-623.
49. Moore M, Yuen HM, Dunn N, Mullee MA, Maskell J, Kendrick T. Explaining the rise in antidepressant prescribing: a descriptive study using the general practice research database [published correction appears in *BMJ*. 2009;339:b4361]. *BMJ*. 2009;339:b3999. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2762496/?tool=pubmed. Accessed September 6, 2011.
50. Marcus SC, Olfson M. National trends in the treatment for depression from 1998 to 2007. *Arch Gen Psychiatry*. 2010;67(12):1265-1273.
51. Frank RG, Goldman HH, McGuire TG. Trends in mental health cost growth: an expanded role for management? *Health Aff (Millwood)*. 2009;28(3):649-659.
52. Mark TL, Levit KR, Buck JA, Coffey RM, Vandivort-Warren R. Mental health treatment expenditure trends, 1986-2003. *Psychiatr Serv*. 2007;58(8):1041-1048.
53. Harman JS, Edlund MJ, Fortney JC. Trends in antidepressant utilization from 2001 to 2004. *Psychiatr Serv*. 2009;60(5):611-616.
54. Olfson M, Marcus SC. National patterns in antidepressant medication treatment. *Arch Gen Psychiatry*. 2009;66(8):848-856.
55. Cully JA, Zimmer M, Khan MM, Petersen LA. Quality of depression care and its impact on health service use and mortality among veterans. *Psychiatr Serv*. 2008; 59(12):1399-1405.
56. National Committee for Quality Assurance. *The State of Health Care Quality, 2009*. Washington, DC: NCQA; 2009.
57. National Committee for Quality Assurance. *The State of Health Care Quality, 2003*. Washington, DC: NCQA; 2003.
58. Busch AB, Ling DC, Frank RG, Greenfield SF. Changes in the quality of care for bipolar I disorder during the 1990s. *Psychiatr Serv*. 2007;58(1):27-33.
59. Busch AB, Lehman AF, Goldman HH, Frank RG. Changes over time and disparities in schizophrenia treatment quality. *Med Care*. 2009;47(2):199-207.
60. Zuvekas SH. Prescription drugs and the changing patterns of treatment for mental disorders, 1996-2001. *Health Aff (Millwood)*. 2005;24(1):195-205.
61. Gibson TB, Lee TA, Vogeli CS, Hidalgo J, Carls GS, Sredl K, DesHarnais S, Marder WD, Weiss KB, Williams TV, Shields AE. A four-system comparison of patients with chronic illness: the Military Health System, Veterans Health Administration, Medicaid, and commercial plans. *Mil Med*. 2009;174(9):936-943.
62. Domino ME, Swartz MS. Who are the new users of antipsychotic medications? *Psychiatr Serv*. 2008;59(5):507-514.
63. Mark TL, Levit KR, Vandivort-Warren R, Buck JA, Coffey RM. Changes in US spending on mental health and substance abuse treatment, 1996-2005, and implications for policy. *Health Aff (Millwood)*. 2011;30(2):284-292.
64. Foster RS. *Estimated Financial Effects of the "Patient Protection and Affordability Care Act" as Amended*. Baltimore, MD: Dept of Health and Human Services; April 22, 2010.

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