
Medicaid's Expenditures for Newer Pharmacotherapies for Adults with Disabilities

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Medicaid's drug expenditures have grown at double-digit inflation rates since 2000. These prescription drug costs are important contributors to increasing health care costs for disabled persons. In spite of this knowledge, little has been reported about specific patterns of medication use among disabled enrollees. We analyzed Kansas Medicaid data to describe trends in medication use patterns across 3 years among disabled beneficiaries. The marked shifts toward newer medications and disproportionate contributions of newer, more expensive medications to overall prescription costs for antipsychotics, antidepressants, anticonvulsants, anti-ulcer medications, anti-inflammatory agents, and opioids have implications for both policy and practice.

INTRODUCTION

Prescription drug costs are an important contributor to increasing health care costs for aged and disabled persons. Medicaid's drug expenditures have grown at double-digit inflation rates since 2000 (Baugh et al., 2004). Although prescription drug coverage for dually eligible beneficiaries transitioned to the Medicare Part D drug benefit on January 1, 2006, the pattern of rising prescription drug costs for

dually eligible Medicaid recipients is likely to continue to affect public expenditures in a similar manner. In fiscal year 2000, the aged- and blind/disabled-eligibility groups accounted for 14.3 and 24.8 percent, respectively, of Medicaid enrollment but 26.8 and 58.1 percent, respectively, of Medicaid prescription drug expenditures (Baugh et al., 2004). Blind and disabled enrollees have seen the sharpest increases in payments for prescription medications since 1990, growing at an annual rate of 20.1 percent compared to 13.5 percent for the elderly (Baugh et al., 2004).

Previously, we assessed the cost contributions of newer pharmaceuticals to growing prescription expenditures for Kansas Medicaid's aged enrollees during a 3-year period (Shireman et al., 2005). Although newer pharmaceuticals accounted for more than 50 percent of prescriptions in four of eight therapeutic classes, they accounted for a disproportionately higher rate of expenditures for five of those classes. Mean prescription prices rose during the 3 years primarily due to the adoption of newer pharmaceuticals as the newer products were at least twice as expensive as older options in six of eight classes.

Little has been reported about the specific patterns of medication use among Medicaid's disabled enrollees. Since they constitute the most expensive Medicaid Program and have even more extreme medication expenditures than the elderly, we performed a similar analysis of newer versus older medication use patterns to help inform State policymakers. It is

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reasonable to assume that this analysis will identify future areas of research into understanding medication use in a highly medicated population.

We analyzed Kansas Medicaid data to describe trends in medication use patterns for seven therapeutic drug classes across 3 years. We limited the analysis to disabled persons between the ages of 18 and 65 who qualified for Social Security Income (SSI) benefits or were medically needy. We excluded other disabled groups who may have received Medicaid benefits, such as those awaiting SSI determination (Medi-Kan). Our exploration was limited to the types of medications commonly used by this population. In particular, we evaluated the impact on Medicaid's expenditures of shifts from older, less expensive medications to newer, more costly options within the same drug class.

METHODS

Study Design

The study design was a retrospective cross-sectional analysis reflecting three sequential, 1-year time periods. Due to the timing of the data extraction, the third time period only included 11 months of prescription claims. The methods were nearly identical to those applied in the analysis of newer medication adoption in an older Medicaid cohort (Shireman et al., 2005). The only difference was the list of therapeutic classes included in the analysis that follows.

Sample Selection

The sampling frame consisted of persons enrolled at least 1 month between May 1999 and April 2002 in Kansas Medicaid's SSI or medically needy disabled programs. The Department of Social and

Rehabilitation Services (SRS) provided a 10-percent random sample ($n = 6,256$) of the sampling frame ($n = 62,651$) to represent the study population. We eliminated 38 cases with dates of death prior to May 1999, leaving a final baseline cohort of 6,218 persons. Persons enrolled in managed care were excluded as their claims data would not be complete.

Data Extraction

Using the beneficiary identification numbers, an SRS programmer extracted all paid and crossover claims from institutions, outpatient service providers, pharmacies, and nursing homes for services rendered during the three study periods. The beneficiary-based claims files contained detailed information regarding services provided, including dates of service; diagnosis codes; procedures conducted or medications dispensed; billing provider information; and payment amounts for Medicare, other third party payers, and Medicaid. The programmer also cleaned the claims data by removing reversals and duplicates and accounting for adjustments. In addition to the claims data, the programmer created an eligibility file that contained beneficiary information such as date of birth, date of death, race and ethnic class, sex, and monthly enrollment indicators for each month during the period that the beneficiary was actively enrolled in Medicaid.

We determined dual eligibility for Medicaid and Medicare by analyzing Medicaid's inpatient and outpatient claims for Medicare payments. We pooled diagnosis codes from institutional, outpatient service, and nursing home claims for each individual, and determined the presence of major medical and mental health conditions through comorbidity flags based on diagnosis codes (Centers for Disease Control and Prevention, 2007) from the *International*

Prescription Drug Analysis

We analyzed drug use patterns in the seven therapeutic classes accounting for the largest expenditures for the Kansas Medicaid disabled population: (1) antibiotics, (2) antidepressants, (3) antipsychotics, (4) anticonvulsants, (5) anti-ulcer medications, (6) diabetes medications, and (7) analgesics. Due to differences in indications for use, we further divided analgesics into two categories: opioids and non-steroidal anti-inflammatory drugs (NSAIDs). These therapeutic classes differed slightly from those examined in our prior analysis of aged Medicaid beneficiaries (Shireman et al., 2005).

Drugs within each therapeutic class were separated into two subclasses, based on relative newness to the class at the time the medication was prescribed (Shireman et al., 2005). A physician and a clinical pharmacist independently classified the individual drugs within each class, with a second physician adjudicating disagreements. For most drug groups, newer and older designations were based on whether or not a generic form of the medication was available during the study timeframe. If the specific drug was available in generic form, then that drug was classified as old, regardless of whether a generic or brand name agent may have been ordered or dispensed. If only a trade-name agent was available during the study timeframe, then the medication was classified as new.

For most drug groups, this categorization paralleled clinically relevant drug characteristics for grouping similar medications together. For example, antipsychotics were categorized as either older, typical antipsychotics (e.g., chlorpromazine and haloperidol) or newer, atypical antipsychotics

(e.g., clozapine, risperidone, and olanzapine). Similarly, we classified the tricyclic amines (TCAs), trazodone, and maprotiline as older antidepressants: selective serotonin reuptake inhibitors (SSRIs), and other trade name only antidepressants (e.g., venlafaxine and mirtazapine) constituted the newer antidepressants. For other therapeutic classes, categories were derived based on clinically relevant distinctions, but which still paralleled older and newer treatment options. For example, opioid analgesics were categorized into the long-acting opioids (e.g., MSContin, Oxycontin, and transdermal fentanyl) or shorter-acting agents. Anti-ulcer agents were categorized into H2 receptor antagonists (H2RA) or proton-pump inhibitors (PPI), after excluding antacids and misoprostol. The final adjudicated categories are shown in Table 1.

Overall Use and Price Changes

After selection and classification of the pertinent medications from the Medicaid pharmacy claims, we explored changes within therapeutic classes over the three study periods. First, we calculated utilization changes within therapeutic categories based on the number of prescriptions per person-years of observation. We determined person-years of observation using the months of eligibility within each study period for each beneficiary. This unit of measure allowed us to document general trends in the use of each class over time.

Secondly, we examined the mean prescription price for agents in the subclass during each period. We included only the amounts paid by Medicaid. Dollar amounts were adjusted for inflation using the U.S. city average consumer price index for all items with 1999 as the base year (U.S. Department of Labor, 2007). Manufacturers' rebates were not considered in the prices since these were proprietary.

Table 1
Individual Medication Categorized as New or Old within Therapeutic Classes

Category	
Old	New
Antibiotics	
Acyclovir, amoxicillin, ampicillin, cefaclor, cefadroxil, cefazolin, cephalexin, chloroquine, clindamycin, clotrimazole, cloxacillin, dapsone, demeclocycline, dicloxacillin, doxycycline, erythromycin, gentamicin, griseofulvin microsize, ketoconazole, lincomycin, mebendazole, mefloquine, methenamine, metronidazole, minocycline, neomycin, nitrofurantoin, nystatin, oxacillin, penicillin, rifampin, sulfamethoxazole/trimethoprim, sulfasalazine, tetracycline, tobramycin sulfate, trimethoprim, vancomycin	Amoxicillin/clavulanate, ampicillin/sulbactam, azithromycin, aztreonam, carbenicillin, cefdinir, cefditoren, cefepime, cefixime, cefpodoxime, cefprozil, ceftazidime, ceftibuten, ceftriaxone, cefuroxime, cephadrine, cinoxacin, ciprofloxacin, clarithromycin, dirithromycin, famciclovir, fluconazole, fosfomycin, ganciclovir, gatifloxacin, griseofulvin ultramicrosize, itraconazole, levofloxacin, linezolid, loracarbef, moxifloxacin, norfloxacin, ofloxacin, oseltamivir, piperacillin/tazobactam, rimantadine, sparfloxacin, terbinafine, ticarcillin/clavulanate, tobramycin sodium sulfate, trovafloxacin, valacyclovir, valganciclovir, zanamivir
Anticonvulsants	
Carbamazepine, clonazepam, diazepam, divalproex, ethosuximide, mephenytoin, mephobarbital, methsuximide, phenytoin, sustained release phenytoin, primidone, valproate, valproic acid	Felbamate, gabapentin, lamotrigine, levetiracetam, oxcarbazepine, tiagabine, topiramate, zonisamide
Antidepressants	
Amitriptyline, amoxapine, clomipramine, desipramine, doxepin, imipramine, maprotiline, nortriptyline, phenelzine, protriptyline, trancyclomine, trazodone	Bupropion, citalopram, fluoxetine, fluvoxamine, mirtazapine, nefazodone, paroxetine, sertraline, venlafaxine
Antidiabetic Agents	
Insulin, chlorpropamide, glipizide, glyburide, metformin	Acarbose, glipizide extended release, glyburide/metformin, glimepiride, insulin glargine, miglitol, nateglinide, pioglitazone, repaglinide, rosiglitazone, troglitazone
Anti-Inflammatory Agents	
NSAIDs: Diclofenac, diflunisal, choline salicylate, ketorolac, ketoprofen, naproxen, sulindac, indomethacin, ibuprofen, oxaprozin, nabumetone, meclofenamate, mefenamic acid, meloxicam, etodolac, salsalate, flurbiprofen, piroxicam, fenoprofen, tolmetin	Cox-2 Selective: Celecoxib, rofecoxib, valdecoxib
Antipsychotics	
Chlorpromazine, fluphenazine, haloperidol, lithium, loxapine, mesoridazine, molindone, perphenazine, pimozide, thioridazine, thiothixene, trifluoperazine	Clozapine, olanzapine, quetiapine, risperidone, ziprasidone
Anti-Ulcer Medications	
H2 antagonist: Cimetidine, famotidine, nizatidine, ranitidine	Proton pump inhibitor: Esomeprazole, lansoprazole, omeprazole, pantoprazole, rabeprazole
Opioids	
Short-acting opioids: Acetaminophen/aspirin/propoxyphene with codeine or hydrocodone, butorphanol, codeine, fentanyl transmucosal, hydrocodone, hydromorphone, meperidine, methadone, morphine, oxycodone, propoxyphene, tramadol	Long-acting opioids: Sustained release oxycodone, sustained-release morphine, fentanyl transdermal

NOTES: If a specific drug was available in generic form, then that drug was classified as old. If only a trade-name was available during the study timeframe, then that drug was classified as new.

SOURCE: Shireman, T.I., University of Kansas Medical Center: Analysis of Kansas Medicaid prescription drug claims from Kansas Department of Social and Rehabilitation Services, 2007.

Market Share Analysis

The next set of outcomes related to new versus old drug use. Drugs within the class designations were compared with respect to (1) the proportion of the market, or

market share, held by each subclass as a percent of total prescriptions for the class; and (2) the market share held by each subclass as a percent of total expenditures for the class.

Table 2

Description of Kansas Disabled Medicaid Enrollees with at Least 1 Month of Eligibility: 1999-2002

Characteristic	May 1999-April 2000		May 2000-April 2001		May 2001-March 2002	
	Number of Subjects	Percent of Subjects	Number of Subjects	Percent of Subjects	Number of Subjects	Percent of Subjects
Total Cohort	4,075	100	4,231	100	4,208	100
Female	2,261	55.5	2,321	54.9	2,341	55.6
Race/Ethnic						
White	3,203	78.6	3,336	78.8	3,301	78.4
Black	653	16	679	16	691	16.4
Hispanic-American	94	2.3	100	2.4	96	2.3
Other	125	3.1	116	2.7	120	2.9
Age Mean	43.1	—	43.8	—	44.3	—
(SD)	(12.6)	—	(12.8)	—	(13.0)	—
Age						
18–35 Years	1,231	30.2	1,200	28.4	1,156	27.5
36–50 Years	1,569	38.5	1,643	38.8	1,595	37.9
51–64 Years	1,275	31.3	1,388	32.8	1,457	34.6
Dually Eligible Enrollee	1,327	32.6	1,359	32.1	1,372	32.6
Eligibility During Period						
< 6 Months	432	10.6	427	10.1	362	8.6
6–9 Months	375	9.2	396	9.4	363	8.6
10–12 Months	3,268	80.2	3,408	80.5	3,483	82.8
Person Years of Eligibility ¹	3,587	—	3,735	—	3,778	—
Comorbidities						
Psychoses	1,634	40.1	1,688	39.9	1,680	39.9
Hypertension	806	19.8	854	20.2	861	20.5
Chronic Lung Diseases	674	16.5	702	16.6	684	16.3
Mental Retardation	532	13.1	495	11.7	548	13.0
Diabetes	491	12.0	560	13.2	568	13.5
Gastrointestinal Disorders	456	11.2	506	12.0	507	12.0
Depression	390	9.6	437	10.3	424	10.1
Cancer	362	8.9	363	8.6	345	8.2
Ischemic Heart Disease	271	6.7	279	6.6	252	6.0
Mobility Disorders	241	5.9	272	6.4	254	6.0
Congestive Heart Failure	240	5.9	235	5.6	218	5.2
Arrhythmias	224	5.5	214	5.1	199	4.7
Cerebrovascular Disease	165	4.0	195	4.6	178	4.2

¹Person years of eligibility is a summation of the length of eligibility for each Medicaid enrollee during the study period.

NOTE: SD is standard deviation.

SOURCE: Shireman, T.I., University of Kansas Medical Center: Analysis of Kansas Medicaid prescription drug claims from Kansas Department of Social and Rehabilitation Services, 2007.

RESULTS

In each study period, the analysis included in excess of 4,000 disabled adults (Table 2). Just over one-half were female (55 percent each year). Over three-quarters (78 percent) were White persons; Black persons were the most predominant minority group. The mean age was 43-44 years, and the highest proportion of enrollees (38

percent) was between the ages of 36 and 50. Nearly one-third of the cohort members (32 percent) were dually eligible for Medicaid and Medicare. Eighty percent or more were eligible for 10-12 months during each period, resulting in over 3,500 person-years of observation per period. The most prevalent conditions among the cohort were psychosis (40 percent), hypertension (20 percent), chronic lung diseases

Table 3
Patterns of Drug Use Adjusted for Person-Years of Observation for Eight Therapeutic Classes
for Kansas Medicaid Disabled Enrollees: 1999-2002

Drug Class	Prescriptions/Person-Year			Percent Change
	May 1999-April 2000	May 2000-April 2001	May 2001-March 2002	
Antidepressants				
New (SSRI/Others)	2.00	2.30	2.52	26.0
Old (TCA)	0.98	0.97	0.92	-5.8
Combined	2.98	3.27	3.44	15.5
Anticonvulsants				
New	0.53	0.74	0.92	72.2
Old	2.42	2.49	2.35	-3.0
Combined	2.95	3.23	3.26	10.6
Opioids				
New (Long-Acting)	0.23	0.33	0.34	46.0
Old (Short-Acting)	2.48	2.43	2.61	5.1
Combined	2.72	2.76	2.95	8.6
Antipsychotics				
New (Atypical)	1.92	2.12	2.23	15.9
Old (Typical)	0.86	0.75	0.65	-24.4
Combined	2.78	2.87	2.88	3.5
Antibiotics				
New	1.04	0.99	1.02	-1.2
Old	1.19	1.11	1.09	-7.6
Combined	2.22	2.09	2.12	-4.7
Antidiabetic Agents				
New	0.41	0.54	0.66	62.2
Old	1.03	1.09	1.04	1.1
Combined	1.43	1.62	1.70	18.4
Anti-Ulcer				
New (PPIs)	1.03	1.15	1.18	14.8
Old (H2RA)	0.63	0.52	0.49	-21.8
Combined	1.66	1.68	1.68	1.0
Anti-Inflammatories				
New (Cox-2 Selective)	0.46	0.69	0.73	58.1
Old (NSAID)	0.84	0.70	0.67	-20.3
Combined	1.31	1.39	1.41	7.5

NOTES: Figures reflect the number of prescriptions in that therapeutic class divided by all cohort members, including those who did and did not receive such a prescription, and displayed per person-year of observation to adjust for different periods of eligibility for each individual. SSRI is selective serotonin reuptake inhibitor. TCA is tricyclic amine. PPI is proton pump inhibitor. H2RA is histamine-2 receptor antagonist. NSAID is non-steroidal anti-inflammatory drug.

SOURCE: Shireman, T.I., University of Kansas Medical Center: Analysis of Kansas Medicaid prescription drug claims from Kansas Department of Social and Rehabilitation Services, 2007.

(16 percent), diabetes (12-13 percent), mental retardation (12-13 percent), and gastrointestinal disorders (11-12 percent), as shown in Table 2.

Table 3 displays the trends in prescription utilization per person-year of observation for each of the drug classes. The classes with the highest use were antidepressants (3.44 prescriptions per person year, or RXs/PY), anticonvulsants (3.26 RXs/PY), opioids (2.95 RXs/PY), and antipsychotics (2.88 RXs/PY). Overall drug use increased in all classes except

for antibiotics which saw a 4.7-percent decline in prescriptions per person year. Newer agents accounted for a clear majority of the increases: newer anticonvulsants increased by 72 percent, newer antidiabetic agents by 62 percent, newer anti-inflammatory agents by 58 percent, newer long-acting opioids by 46 percent, and newer antidepressants by 26 percent. The use of older agents declined in six of the eight classes: antibiotics, antipsychotics, antidepressants, anticonvulsants, anti-ulcer medications, and anti-inflammatory

Table 4
Changes in Mean Prescription Price for Eight Therapeutic Classes for Kansas Medicaid Disabled Enrollees: 1999-2002

	Mean Prescription Price			
Drug Class	Period 1	Period 2	Period 3	Percent Change
Antidepressants				
New (SSRI/Others)	\$84.51	\$84.89	\$86.43	2.3
Old (TCA)	14.16	10.99	8.24	-41.8
Combined	61.37	62.92	65.45	6.7
Anticonvulsants				
New	139.34	133.73	136.15	-2.3
Old	52.27	49.28	48.08	-8.0
Combined	67.97	68.58	72.81	7.1
Opioids				
New (Long-Acting)	171.56	234.85	310.77	81.1
Old (Short-Acting)	20.81	22.45	22.89	10.0
Combined	33.65	47.96	55.86	66.0
Antipsychotics				
New (Atypical)	182.39	183.98	191.35	4.9
Old (Typical)	31.80	29.07	29.59	-6.9
Combined	135.76	143.33	154.74	14.0
Antibiotics				
New	93.96	93.37	83.36	-11.3
Old	17.35	16.63	16.68	-3.9
Combined	53.07	52.72	48.88	-7.9
Antidiabetic Agents				
New	77.86	66.50	69.55	-10.7
Old	39.29	42.31	46.11	17.4
Combined	50.22	50.32	55.21	9.9
Anti-Ulcer				
New (PPIs)	130.90	123.20	118.04	-9.8
Old (H2RA)	60.46	50.99	28.05	-53.6
Combined	104.26	100.64	91.67	-12.1
Anti-Inflammatories				
New (Cox-2 Selective)	80.27	79.39	83.87	1.3
Old (NSAID)	37.93	34.64	31.64	-16.6
Combined	52.94	56.84	58.88	11.2

NOTES: Combined indicates mean price for entire market basket including new and old agents. Mean prescription prices adjusted for inflation to 1999 dollars. SSRI is selective serotonin reuptake inhibitor. TCA is tricyclic amine. PPI is proton pump inhibitor. H2RA is histamine-2 receptor antagonist. NSAID is non-steroidal anti-inflammatory drug.

SOURCE: Shireman, T.I., University of Kansas Medical Center: Analysis of Kansas Medicaid prescription drug claims from Kansas Department of Social and Rehabilitation Services, 2007.

agents. The most dramatic declines were seen in the older antipsychotics (24 percent), anti-ulcer medications (22 percent), and anti-inflammatory agents (21 percent).

Table 4 shows changing mean monthly prescription expenditures for each drug class, including increases for six of the eight classes. In contrast, mean monthly expenditures declined for antibiotics and anti-ulcer medications, with costs for both newer and older drugs in both of these classes decreasing. For example, mean monthly PPI expenditures declined from

\$130.90 to \$118.04 per drug and mean monthly H2-antagonist prices declined from \$60.46 to \$28.05. This is likely due to generic versions of omeprazole (a PPI) and ranitidine (an H2-antagonist) becoming available part-way through the study. The largest increase in prescription price occurred for the long-acting opioids where mean monthly prices increased from \$171.56 to \$310.77, or 81 percent. Although prices for older agents generally declined, they increased for short-acting opioids and antidiabetic agents.

In all classes, newer agents accounted for a higher percent of expenditures than the percentage of prescriptions as shown in Figure 1. (Additional information is available on request from the author.) Antibiotics and antidiabetic agents saw the least change in the relative composition of newer and older agents. For all other groups, newer medications contributed disproportionately to expenditures. For instance, newer anti-inflammatory agents accounted for 35 percent of the prescriptions in the class in the first period, but 54 percent of the expenditures. They grew to 52 percent of the prescriptions and 74 percent of the expenditures by the third period. Long-acting opioid use grew only slightly from 9 to 11-12 percent of prescriptions, but accounted for a marked increase in the proportion of expenditures (increasing from 43 to 64 percent). Newer antipsychotics, antidepressants, and anti-ulcer medications comprised over 70 percent of prescriptions and over 90 percent of expenditures in their respective markets. Newer anticonvulsants grew from 18 to 28 percent of prescriptions accompanied by a change from 37 to 53 percent of expenditures.

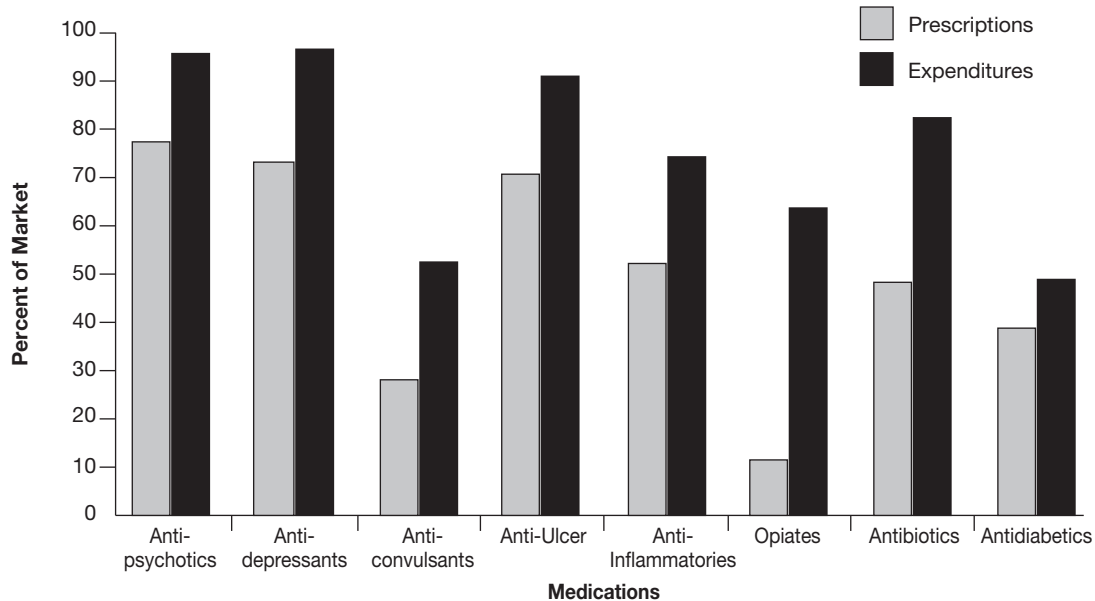
DISCUSSION

Our purposes were to describe patterns of prescription drug use among the Kansas Medicaid disabled population and to examine the contribution to Medicaid's expenditures from shifts toward newer medications. We found marked shifts toward newer medications over a 3-year period and disproportionate contributions of newer, more expensive medications to overall prescription costs for antipsychotics, antidepressants, anticonvulsants, anti-ulcer medications, anti-inflammatory agents, and opioids. These results are quite similar to those we reported for the aged Medicaid beneficiaries (Shireman et al., 2005).

The fact that newer medications are commonly prescribed and that these agents are more expensive to purchase is a familiar theme for health care professionals, policymakers, and the public. However, this study quantifies that pattern for specific, commonly used medication groups and describes the cost impact on Medicaid's pharmacy programs for disabled persons, currently the most expensive Medicaid enrolled population. Other researchers have noted that rising prescription costs in Medicaid are attributable in part to the prescribing of newer, more expensive drugs when older, less-expensive agents might often be equally effective (Morden and Sullivan, 2005; Soumerai, 2004; Soumerai, Majumdar, and Lipton, 2000). Frank et al. (2005) explored this trend specifically among psychotropic drugs. They showed that growth in spending for antipsychotics was due to changes in the price and volume of newer drugs. Medicaid provides coverage for nearly 27 percent of all mental health expenditures (Mark and Buck, 2005), and since the disabled program includes persons with severe mental illness, the present study, in part, reflects how those dollars are being spent with respect to psychiatric medications. Further, regarding Medicaid's overall spending on individual prescription products, they noted that newer antipsychotics ranked first, second, and eighth, against drugs that would be disproportionately used by the disabled Medicaid enrollees when compared to females, children, and the elderly. Indeed, the authors speculated that generous coverage by Medicaid and other insurance programs broadened the use of expensive medications and resulted in a greater willingness by physicians to prescribe them. Soumerai et al. (2000) noted, "...there is little doubt that the importance of suboptimal prescribing practice (both under- and overuse) vastly outweighs the costs of

Figure 1

Market Shares as Percent of Prescriptions and Expenditures for Newer Agents in Major Therapeutic Classes Used in the Kansas Medicaid Disabled Program: 2001-2002



SOURCE: Shireman, T.I., University of Kansas Medical Center: Analysis of Kansas Medicaid prescription drug claims from Kansas Department of Social and Rehabilitation Services, 2007.

medications themselves.” Recognizing this potential, several States are currently considering legislation that limits the ability of pharmaceutical sales representatives to gather data on physician prescribing practices. Such efforts are intended to curb targeted outreach to certain physicians that can result in overprescription of new and expensive brand name drugs (Saul, 2006).

The 1990 Omnibus Budget Reconciliation Act (OBRA) prevented State Medicaid Programs from imposing restrictive formularies and limited avenues for influencing drug utilization patterns. Many State Medicaid Programs have tried to control their prescription drug costs through drug utilization review, monthly caps on numbers of prescriptions, prior authorization programs, and more recently, preferred drug lists, though these programs have had limited effectiveness (Crowley, Ashner, and Elam, 2005). Under Medicare Part D, CMS

clearly expects prescription drug plans to implement utilization management and cost control tools, such as step therapy and therapeutic interchange. The 2003 Medicare Prescription Drug, Improvement, and Modernization Act legislation and its regulations make clear that a high use of generic medications is a goal for the Part D program (*Federal Register*, 2005). Nationally, 2.5 million dually eligible disabled persons transitioned from Medicaid to Medicare Part D coverage for prescriptions on January 1, 2006. Generally, Part D prescription drug plans (PDPs) are required to cover all or substantially all of the drugs within three of the classes studied here: antidepressants, antipsychotics, and anticonvulsants. For the other drug classes studied, PDPs are only required to cover at least two medications within a pharmacologic class. The implications for expanding generic drug use and cost control are unclear.

Several limitations of this study should be noted, including those that relate to the use of administrative claims data for research purposes. Although Medicaid pharmacy claims are widely considered to be reliable, the identification of diagnosis codes in administrative data may be more accurate for some conditions than for others. Expenditure data reflected only Medicaid's contribution and did not include costs borne by other payers. As previously noted, health outcomes, including quality of life and adherence, associated with various prescribing options were not examined. The study sample reflects a wide breadth of types of health conditions and disabilities: patterns among subgroups of beneficiaries with particular diseases may vary. Finally, these data come from a single Midwestern State with a relatively open Medicaid formulary during the study period and may not reflect the experience of other State Medicaid Programs or that of other payers.

It is also important to note that only drug expenditures are reported here. For many of these medication classes, newer medication options may have potential benefits in terms of improved tolerability, reduced dosing frequency, better adherence, or other favorable clinical characteristics. Newer medications may also be advocated by current practice guidelines, consensus statements, and disease management algorithms, and thus be preferred by prescribers. Patients may also have strong preferences for newer medications that they believe may have better tolerability or outcomes. To the extent that clinical outcomes may be better with newer, more expensive medications than with older, less expensive ones for the same condition, cost offsets may occur in other parts of the health care system due to aborted hospital admissions, fewer disease complications, or other laudable outcomes. For instance, the atypical antipsychotics were considered

a major advance in psychiatry because of lower rates of extra-pyramidal side effects that were associated with the older, typical antipsychotics. This likely fueled the rapid adoption of atypical antipsychotics and the near obsolescence of the typical antipsychotics and may have prevented many untoward reactions among persons with severe mental illness. More recent concerns about weight gain and subsequent development of diabetes coupled with trials demonstrating little therapeutic advantage associated with the atypical antipsychotics, however, have raised questions about their relative cost effectiveness. It is reasonable to assume that certain patients would benefit more from the use of atypical antipsychotics than other patients would. It is important to remember, however, that newer agents often are adopted outside the narrow scope of the populations in whom such clear cost effectiveness has been shown; the literature is replete with examples of non-selective diffusion of innovation (Dai, Stafford, and Alexander, 2005). Because manufacturers only have to demonstrate efficacy relative to placebo, clinicians have little guidance in selecting cost-effective therapy. Further work in evidence-based guidelines can help to inform clinicians.

The size and breadth of Part D will give it power to inform drug benefit design and provide a rich database for postmarketing drug surveillance (Morden and Sullivan, 2005). With regard to the findings we present, the differential Part D formulary design requirements for some drug classes versus others may create a test of which cost control strategies are effective and appropriate. Carefully designed studies that examine the impact of varying Part D coverage of key medication classes, such as those described here, and medication therapy management services on patient outcomes would contribute substantially

to our knowledge of relative therapeutic cost effectiveness.

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