Published in final edited form as:

Health Aff (Millwood). 2011 December ; 30(12): . doi:10.1377/hlthaff.2010.1296.

Medicaid Cost Control Measures Aimed at Second Generation Antipsychotics Led to Less Use of All Antipsychotics

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Abstract

Atypical antipsychotics and other psychotherapeutics are increasingly subject to prior authorization and other restrictions in state Medicaid programs, begging the question of how these formulary restrictions affect the drug treatments being delivered. To find an answer we collected drug-level information on utilization management for 30 state Medicaid programs over the past 10 years and drug-level utilization data for state Medicaid programs. We find that prior authorization requirements on atypical antipsychotics and other psychotherapeutics greatly reduced the utilization of these drugs and this reduction is not offset by substitution to other drugs in the same drug classes—with the adverse consequence that fewer patients are receiving pharmacotherapy.

Introduction

Increasingly, public and private health insurance plans are imposing prior authorization and other requirements to better manage drug spending. These programs typically establish a list of preferred drugs and require use of older or less expensive medications before covering newer therapies (step therapy) or require authorization from the plan before covering medications not on the preferred list. Forty-five states and the District of Columbia have implemented these lists in their Medicaid state programs, where prior authorization requirements are the preferred measure for reducing pharmaceutical expenses.¹

Prior authorization programs intend to save money by steering utilization to lower cost medications and by aiding states in price negotiations with pharmaceutical manufacturers.^{2,3} Companies agree to offer their medication to Medicaid at a lower price, and in return, the state agrees to place the medication on the state's preferred-drug list. Inclusion on this list is a strong incentive to pharmaceutical manufacturers, who know that prior authorization requirements are a hurdle that will almost certainly reduce patient access to their products.

In addition to increasing the number of medications subject to prior authorization, some states are applying it to therapeutic classes once considered off-limits to such restrictions. For example, state Medicaid programs have been reluctant to restrict the choice of psychotherapeutics because of the vulnerability of the mentally ill and their heterogeneous response to these medications.⁴ However, spending on psychotherapeutic drugs comprises one quarter of total Medicaid drug spending, making it a logical target of cost containment.⁵ In particular, many states have targeted second generation antipsychotics (so-called "atypicals") for prior authorization given their relatively high cost and increasing use among Medicaid enrollees. One study found, for example, that by 2005, most states spent in excess of 15 percent of their Medicaid drug budgets on atypicals.⁶ Prior studies examining the impact of management controls on psychotropic drug use have relied on dual state comparisons in which outcomes of mentally-ill Medicaid recipients are compared between a

single state which implemented a new utilization management strategy (e.g. prior authorization or prescription-limits) and a control state which did not.⁷⁻¹¹ For example, when Maine subjected atypicals to prior authorization, the risk of atypical medication discontinuation increased by 29 percent among non-elderly patients with schizophrenia compared to a control state, while the rate of initiation of bipolar treatments among non-elderly patients decreased by 32.3 percent.^{7,8} Studies in Georgia⁹ and New Hampshire¹⁰ found that prior authorization and other prescription restrictions reduced utilization of targeted drugs but increased spending on outpatient and other health services.

While dual state comparisons are informative, the results may not generalize to the experiences of the more than 30 state Medicaid programs which have implemented such policies. This paper augments earlier work by examining, in thirty states, the effects of prior authorization on the use of the targeted drug, other drugs in its class, and drugs in a related class, over the last decade. Antidepressants and anticonvulsants are commonly used in conjunction with antipsychotics, and have been shown to improve the efficacy of treatment for schizophrenia.¹² Our analysis includes all three classes of drugs; however, we focus our discussion on atypical antipsychotics because they are the primary target of cost-control measures in state Medicaid programs. Although our results are somewhat sensitive to the inclusion of the three classes of drugs, the results reported in Appendix B, model 2 demonstrate that prior authorization has similar effects in each drug class.

Data

Regulatory policies

We collected information from 30 state Medicaid programs on their utilization review policies for atypical antipsychotics, antidepressants, and anticonvulsants over the period 1999 to 2008. These states were chosen based on the availability of extensive Medicaid fee-for-service claims and to assure that both states with and without prior authorization restrictions on study were included. The survey asked whether prior authorization, quantity limits, step-therapy, and other policies applied to a list of drugs, identified by US brand name (see Appendix E). To supplement the survey, we examined Medicaid pharmacy program websites and internet archive websites for relevant documents: preferred drug lists; quantity limit lists; pharmacy and therapeutics committee meeting minutes; prior authorization criteria; instructions and frequently asked questions; letters to providers and beneficiaries; and provider/pharmacy manuals. We also communicated with Medicaid program personnel by telephone and email.

The survey asked specifically about 10 common atypicals, 22 antidepressants, and 5 anticonvulsants, listed by US propriety name for branded drugs and generic name for generics. In 1999, at the beginning of our survey period, five of the atypicals, 11 of the antidepressants, and all of the anticonvulsants existed on the market. The other 16 new ingredients, new forms, or generics were introduced during the study period. The list of antidepressants mainly consists of selective serotonin reuptake inhibitors and newer drugs. We only studied those anticonvulsants commonly prescribed to treat bipolar disorder.

Information on several types of use restrictions were collected. Prior authorization requires a prescriber to obtain permission to prescribe a medication before prescribing. Quantity limits restrict how much of a particular drug may be dispensed over a month supply while dose optimization limits daily dosing frequencies. Since the two regulations are so similar and because states tend to use one or the other for any particular drug, we subsumed dose optimization into quantity limits. Step therapy requires that a particular medication be prescribed only after a trial of other selected medications and documentation of non-satisfactory responses from patients is provided to the State Medicaid program. Dose

restriction discourages usage of specific dosages or forms of certain drugs. Duplicate therapy restricts concurrent use of two or more drugs in the same drug class. We also noted other less common policies that restrict age of patients or specialty of prescribers.

Of the 30 states contacted, we were able to assemble substantially complete information from 24 of them (80 percent). Of the six states for which we have only partial information, the least completed state was Illinois, for which we acquired detailed current policy information but no historical information.

The period of our investigation, 1999 to 2008, saw the introduction of many atypicals, a dramatic increase in atypical expenditures and the rapid development of Medicaid utilization management. The regulatory data permit the examination of the long-term consequences of Medicaid utilization management of psychiatric drugs.

Utilization data

State-level utilization data were obtained from the State Drug Utilization Data files available from the Centers for Medicare and Medicaid Services (CMS). The data include the amount reimbursed and the number of prescriptions filled for each drug by each state Medicaid program, by calendar quarter. These data were collected for 1999 through 2008 for the study drugs and for conventional antipsychotics. However, because prescription spending for those dually eligible for Medicaid and Medicare migrated from the Medicaid program to the Part D program beginning in 2006, data after 2005 are not comparable to data from 2005 and before. State-level Medicaid enrollment as of June of each year was obtained from the Kaiser Family Foundations' State Health Facts database.¹³

Methods—The key outcomes are drug utilization, measured by prescriptions per enrollee, and drug expenditure, measured by drug spending per enrollee in 2008 dollars, adjusting for inflation using the consumer price index. Since the data are disaggregated by drug but aggregated across enrollees, it is impossible to limit analysis to those enrollees diagnosed with schizophrenia. However, since we do include state-level fixed effects, we are treating each state as its own control, so that unmeasured schizophrenia prevalence will only introduce bias if state level prevalence changes systematically around the time that states adopt utilization review—a hypothesis we cannot test with current data.

Regulation is measured in two ways. In analyses at the individual drug level, regulations are represented by a series of binary variables indicating whether this drug is subject to prior authorization, quantity limit, step therapy, etc., in each state, each year. In analysis at the drug class level, we aggregate binary measures for individual drugs to one measure for the drug-class, weighted by each drug's national share of utilization that year.

We first report the percentage of states adopting various regulations over time and the mean levels of per-enrollee spending and utilization of atypical and conventional antipsychotics over time, both for states with and without prior authorization—our primary focus—for atypicals. Because of the introduction of Part D, utilization data from 2006-2008 are not directly comparable to data from 1999-2005. For this reason, the descriptive analyses omit data from 2006-2008.

To address differences among states, among drugs, and over time in utilization and spending, we conduct a fixed-effects regression analysis. We regress drug utilization on a full set of state fixed effects, time fixed effects, drug fixed effects, and interactions among these. The effect of the utilization management techniques is measured via binary variables for the presence of prior authorization and other utilization management techniques. The fixed-effects panel design allows each state (for each drug) to serve as its own control in a

natural experiment design. In the regression analyses, the introduction of Part D is accounted for via the use of fixed effects for each state after 2005.

Results

Overall spending and utilization

From 1999 to 2005, spending on and use of antipsychotics grew at a rapid pace, reflecting increased utilization and a shift to the newer atypicals (Exhibit 1). For the average Medicaid program, annual spending per enrollee on antipsychotic agents increased by 106 percent net of general inflation, from \$82 per enrollee in 1999 to \$169 in 2005 (2008\$), while the number of prescriptions per enrollee increased by 29 percent, from 0.54 per enrollee to 0.70. During the same period, spending on antidepressants grew by 33 percent while antidepressant prescriptions grew by 53 percent. Exhibit 2 shows that both atypical antipsychotics and antidepressants had a number of new drug introductions during this period. However, many of the new antidepressant drugs were generic versions of existing branded products, while the new antipsychotics were more likely to be new molecular entities.

Regulation

Utilization management by Medicaid programs also increased dramatically from 1999 to 2008 (Exhibit 3). The most common type of utilization management is prior authorization, which, by 2008, was used by 63 percent of states for atypicals, 77 percent of states for antidepressants, and 37 percent of states for anticonvulsants. The number of drugs requiring prior authorization also increased over the period—from 1 to 3.6 out of the 10 drugs covered by our survey. The variation is also substantial—most required prior authorization from 1 to 7 drugs, and one state required prior authorization for all 10 drugs. The drugs most commonly subject to prior authorization were Clozaril, orally disintegrating tablets of Abilify and Zyprexa, and the injectable form of Risperdal. Conventional Abilify and Zyprexa also commonly require prior authorization. The criteria for granting authorization varied as well—from a failed trial of preferred agents to documentation of clinical necessity.

We also found that a greater absolute number of antidepressants than atypicals are subject to prior authorization (Exhibit 3). There are, however, more brand name drugs and various extended release forms in the antidepressant class. If we group the drugs by active ingredient and only count that ingredient as subject to prior authorization if all drugs with that ingredient are subject to it, then the average number of atypicals on prior authorization is 2 out of 6 ingredients, and 2 out of 9 ingredients for antidepressants. Anticonvulsants are less frequently subject to prior authorization than the other two drug classes. However, three states restrict prescription of anticonvulsants for treatment of non-seizure disorders. Although we do not show data for regulation of typical antipsychotics, they are also less frequently subject to prior authorization than are atypicals.

The trend in the use of quantity limits is similar, as their use rose from 3 percent of states in 1999 to 63 percent in 2008 for atypicals. Interestingly, there is little overlap between the states employing prior authorization and the states employing quantity limits, as more than 90 percent of states employ at least one of the two techniques.

Step therapy is another fairly common technique, and, although it was not used prior to 2000, 25 states were using it by 2008. Dose restriction also rose from insignificance to use by 7 percent of states for atypicals and 30 percent of states for antidepressants by 2008. Dose restriction appears to be used by some state Medicaid programs to enforce a *de facto* pill-splitting policy (by requiring 30mg tablets to be bought rather than 10mg tablets) where

that is cost-reducing. There were a number of less common techniques including restrictions on duplicate therapy, age edit, and specialty edit.

Utilization and regulation

The Medicaid programs that instituted prior authorization experienced lower growth in spending. In the eleven states instituting prior authorization between 1999 and 2008, atypical use per enrollee rose by 14 percent--compared with 19 percent for the other 19 states. Interestingly, there is no significant correlation between the imposition of prior authorization and initial levels of spending (results available upon request)—suggesting that while States may impose prior authorization for various reasons, levels of spending across States was not one of them.

Although prior authorization reduces use of atypicals, it does not seem to induce substitution to conventional antipsychotics. All but one of the thirty survey states experienced a decrease in conventional antipsychotic use per-enrollee (not shown). States which instituted prior authorization on *atypical antipsychotics* experienced faster declines in conventional antipsychotic use ($p=0.06$; not shown), which – as shown in the regression analysis—suggest overall reductions in use of psychiatric medications.

To confirm these results, we performed fixed effects regression analyses of utilization on prior authorization (reported in Appendixes A and B). These regressions take into account state effects, time effects, drug effects, all of the two-way interactions among these, the effects of prior authorization on each drug, the effects on each drug of having other drugs in its class being on prior authorization (i.e. substitution effects). We also accounted for the existence of drug life cycle effects. These are systematic changes in drug use over the course of the drug's lifetime on the market. Typically, newly introduced branded drugs have low consumption which builds up over time. Then, as competitor drugs in the same and related classes enter and especially as generic competitors enter, the branded drug's demand falls. These effects are accounted for in our regression analyses via the use of drug-time fixed effects. In some regressions, we also include binary indicators for the other major regulations (quantity limits, step therapy, dose restriction, and duplicate therapy) to verify that the results are robust.

Two key findings emerge from this analysis. First, prior authorization dramatically reduces consumption of the targeted drugs (Exhibit 4). Second, prior authorization has spillovers outside the targeted drugs, with the result that the overall use of psychiatric drugs falls. That is, imposing prior authorization on one atypical antipsychotic drug reduces consumption of antipsychotics overall, demonstrating that any substitution is incomplete. Specifically, subjecting the leading atypical to prior authorization reduces the number of prescriptions for that atypical agent by 35 percent (Exhibit 4). Individuals who are discouraged from using this drug may either substitute to another antipsychotic drug, or forego antipsychotic drug treatment altogether. If they substitute to other drugs, then the overall use of antipsychotics should not fall. However, overall antipsychotic use does fall, by about 4.5 percent. More stringent policies have larger effects. Imposing prior authorization on the two leading atypicals reduces consumption of the targeted drugs by about the same amount (35 percent), but overall use falls by 6 percent. Thus, any substitution from atypicals to typicals in response to prior authorization must be incomplete.

Discussion

State Medicaid programs, which institute prior authorization requirements for the use of atypical antipsychotics, see dramatic reductions in the use of those atypicals which are targeted by prior authorization. This dramatic decline is what one would expect. The

potential problem is that the reduced use of regulated drugs is not fully offset by substitution to other atypicals or to typical antipsychotics. Thus, the imposition of these regulations is followed by a decrease in use of both atypical and conventional antipsychotics.

Previous research has indicated that reductions in antipsychotic drug benefits and the associated reductions in atypical use may cause increases in the use of other types of healthcare services, including inpatient and outpatient care for the treatment of schizophrenia.^{11,19} While prior authorization was successfully implemented in some other drug classes, achieving significant savings without significant adverse outcomes,²⁰⁻²² this success may not be replicated with antipsychotics.

Although our results cannot bear directly on this point, if the reduction in atypical use leads, through the drop in antipsychotic use, to more poorly controlled schizophrenia, this may have an impact on indirect costs. Poorly controlled schizophrenia may lead to a lower probability of re-attachment to the labor market or to a greater probability of contact with law enforcement, each with its concurrent costs, not to mention potential reduction in the quality of life of Medicaid recipients. On the other hand, if the reductions in antipsychotic use were documented to be largely related to reductions in inappropriate use, then there could be benefits to patients beyond the obvious cost savings to Medicaid.

Limitations

Our study has several limitations. First, it is impossible to be sure whether any reductions in medication use we observe represent the discontinuation of appropriate atypical antipsychotic use or of inappropriate use. Second, because we use aggregate data on drug use, we are unable to determine which specific subpopulations of Medicaid enrollees are most affected, including the elderly and adolescents—two populations of great policy interest. Finally, we are unable to track the effect of these policies on outcomes. With aggregate data, we are unable to measure increases in hospitalizations, outpatient treatments, or other treatments for schizophrenia. We are unable to track changes in mortality and morbidity more generally for those receiving treatment for schizophrenia.

Future Directions

Some of the issues raised in this paper also apply to Part D drug plans, where prior authorization is common. Furthermore, since stand-alone Part D plans do not pay for the inpatient and outpatient care portions of their enrollees, they do not have financial incentives to take into account effects that utilization management policies might have on the consumption of other categories of medical care. However, Medicare Advantage plans (e.g. Medicare HMOs, PPOs) do have incentives to take these effects into account since they are at financial risk for high medical expenditures. In a recent report, the Kaiser Family Foundation documents that Medicare Advantage plans have more generous prescription drug benefits than do stand-alone prescription drug plans. The report attributes this, in part, to this difference in incentives.²³

The current literature points to the need for research on a large, national sample of Medicaid enrollees under treatment with atypical antipsychotics. With patient level claims data, one could investigate how much of the utilization reduction in response to prior authorization is accounted for by discontinuation of appropriate medications and how much by a reduction in questionable usage. One could assess clinical outcomes and economic consequences to other health care services for those individuals whose usage of atypical antipsychotics is affected by prior authorization and other regulations. Another promising direction for future work would be to link Medicaid and criminal justice records in order to determine the

degree to which reductions in the use of atypical antipsychotics lead to increased burdens on the criminal justice system.

Policy Implications

Our findings suggest drugs and drug classes that exhibit significant heterogeneity in clinical efficacy may be inappropriate targets for prior authorization. However, this does not mean that such requirements should be discontinued in all cases. Comparative effectiveness research (CER) can and should guide physicians and health plans on appropriate first treatment based on average efficacy. Identifying those drug classes that are likely to exhibit heterogeneous treatment responses such as antidepressants and antipsychotics is important since a failure to respond to first therapy often means other treatments requiring PA will be effective. Transitioning to these secondline therapies in a timely manner should be the goal of PA policies, which currently impose significant burden to practicing physicians.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

NOTES

1. State Medicaid Outpatient Prescription Drug Policies: Findings from a National Survey 2005 Update. Washington: Kaiser Commission on Medicaid and the Uninsured; 2005.
2. Mello MM, Studdert DM, Brennan TA. The pharmaceutical industry versus Medicaid: limits on state initiatives to control prescription-drug costs. *N Engl J Med*. 2004; 350:608–13. [PubMed: 14762190]
3. Preferred Drug List Annual Report. Austin (TX): Health and Human Services Commission; 2006.
4. Huskamp, Haiden A. Pharmaceutical cost management and access to psychotropic drugs: The U.S. context. *Int J Law Psychiatr*. 2005; 28(5):484–95.
5. Hearne, J. Prescription Drug Coverage Under Medicaid. Washington (DC): US Library of Congress, Congressional Research Service; 2008.
6. Polinski JM, Wang PS, Fischer MA. Medicaid's Prior Authorization Program And Access To Atypical Antipsychotic Medications. *Health Aff (Millwood)*. 2007; 26(3):750–60. [PubMed: 17485754]
7. Soumerai SB, Zhang F, Ross-Degnan D, Ball DE, LeCates RF, Law MR, et al. Use of atypical antipsychotic drugs for schizophrenia in Maine Medicaid following a policy change. *Health Aff (Millwood)*. 2008; 27(3):w185–95. [PubMed: 18381404]
8. Lu CY, Soumerai SB, Ross-Degnan D, Zhang F, Adams AS. Unintended impacts of a Medicaid prior authorization policy on access to medications for bipolar illness. *Medical Care*. 2010; 48(1):4–9. [PubMed: 19956079]
9. Law MR, Ross-Degnan D, Soumerai SB. Effect of prior authorization of second-generation antipsychotic agents on pharmacy utilization and reimbursements. *Psychiatr Serv*. 2008; 59:540–546. [PubMed: 18451014]
10. Farley JF, Cline RR, Schommer JC, Hadsall RS, Nyman JA. Retrospective assessment of Medicaid step-therapy prior authorization policy for atypical antipsychotic medications. *Clin Ther*. 2008; 30(8):1524–39. [PubMed: 18803994]
11. Soumerai SB, McLaughlin TJ, Ross-Degnan D, Casteris CS, Bollini P. Effects of a limit on Medicaid drug-reimbursement benefits on the use of psychotropic agents and acute mental health services by patients with schizophrenia. *N Engl J Med*. 1994; 331(10):650–55. [PubMed: 8052275]
12. Singh SP, Singh, et al. Efficacy of antidepressants in treating the negative symptoms of chronic schizophrenia: meta-analysis. *Br J Psychiatry*. 2010; 197(3):174–179. [PubMed: 20807960]
13. Available from <http://www.statehealthfacts.org/> as of June 29, 2009. Due to lack of availability, December, 2006 enrollment was used in place of June 2007 enrollment.

14. Zhang Y, Adams AS, Ross-Degnan D, Zhang F, Soumerai SB. Effects of prior authorization on medication discontinuation among Medicaid beneficiaries with bipolar disorder. *Psychiatr Serv*. 2009; 60(4):520–27. [PubMed: 19339328]
15. Carson S, McDonagh MS, Peterson K. A Systematic Review of the Efficacy and Safety of Atypical Antipsychotics in Patients with Psychological and Behavioral Symptoms of Dementia. *J Am Geriatr Soc*. 2006; 54(2):354–61. [PubMed: 16460391]
16. Katz IR, Rovner BW, Schneider L. Use of Psychoactive Drugs in Nursing Homes. *N Engl J Med*. 1992; 372(190):1392–93. [PubMed: 1406849]
17. Briesacher BA, Limcangco MR, Simoni-Wastila L, Doshi JA, Levens SR, Shea DG, et al. The Quality of Antipsychotic Drug Prescribing in Nursing Homes. *Arch Intern Med*. 2005; 165(11):1280–85. [PubMed: 15956008]
18. FDA. FDA Public Health Advisory: Deaths with Antipsychotics in Elderly Patients with Behavioral Disturbances. 2005 Apr 11.
19. Soumerai SB. Benefits and Risks of Increasing Restrictions on Access to Costly Drugs in Medicaid. *Health Aff (Millwood)*. 2004; 23(1):135–46. [PubMed: 15002636]
20. Smalley WE, Griffin MR, Fought RL, Sullivan L, Ray WA. Effect of a prior-authorization requirement on the use of nonsteroidal anti-inflammatory drugs by Medicaid patients. *N Engl J Med*. 1995; 332(24):1612–17. [PubMed: 7753141]
21. Delate T, Mager DE, Sheth J, Motheral BR. Clinical and financial outcomes associated with a proton pump inhibitor prior-authorization program in a Medicaid population. *Am J Manag Care*. 2005; 11(1):29–36. [PubMed: 15697098]
22. Fischer MA, Schneeweiss S, Avorn J, Solomon DH. Medicaid prior-authorization programs and the use of cyclooxygenase – 2 inhibitors. *N Engl J Med*. 2004; 351(21):2187–94. [PubMed: 15548779]
23. Hoadley, J.; Summer, L.; Hargrave, E.; Cubanski, J.; Neuman, T. Medicare Part D 2010 data spotlight: Medicare prescription drug plans in 2010 and key changes over five years: summary of findings. 2010. <http://www.kff.org/medicare/upload/8096.pdf>

Exhibit 2. Per Beneficiary Medicaid Spending and Drug Introductions, 1999-2005

Source: Utilization: State Drug Utilization Data files from CMS; Enrollment: Kaiser Family Foundations' State health Facts database; Drug introduction: Orange Book, FDA.

Exhibit 1**Annual Psychiatric Drug Utilization in 30 State Medicaid Programs, 1999-2005**

Drug Class	<u>Annual spending per beneficiary</u>		<u>Annual no. of Prescriptions per beneficiary</u>	
	1999	2005	1999	2005
Antipsychotics	\$82	\$169	0.54	0.70
Antidepressants	\$51	\$67	0.58	0.89
Anticonvulsants	\$22	\$45	0.23	0.26
No. of states	29	30	29	30

SOURCE: Center for Medicaid and Medicare Services.

Notes: Spending is measured in 2008 dollars. Utilization after 2005 is not comparable to earlier periods because of Part D implementation. Utilization data for Indiana is missing in 1999.

Exhibit 3**Medicaid Regulation of Psychiatric Drugs in 30 States, 1999-2008**

Utilization management policy	Percent of states with regulation:		Mean no. of drugs covered ^d	
	1999	2008	1999	2008
Antipsychotics				
Prior Authorization	3.3	63.3	1	3.6
Quantity Limit - Dose Optimization ^f	3.3	63.3	5 ^e	6.0
Step Therapy	0.0	23.3	--	3.4
Dose Restriction ^g	0.0	6.7	--	1.0
Duplicate Therapy ^h	0.0	10.0	--	7.7
No. of drugs on market	--	--	5	10
Antidepressants				
Prior Authorization	10.0	76.7	1.67	9.7
Quantity Limit - Dose Optimization ^f	3.3	53.3	11 ^e	10.4
Step Therapy	0.0	26.7	--	6.6
Dose Restriction ^g	3.3	30.0	1	2.8
Duplicate Therapy ^h	0.0	10.0	--	19.7
No. of drugs on market	--	--	11	21
Anticonvulsants				
Prior Authorization	3.3	36.7	1	1.6
Quantity Limit - Dose Optimization ^f	3.3	6.7	5 ^e	3.0
Step Therapy	0.0	16.7	--	1.0
Dose Restriction ^g	0.0	3.3	--	1.0
Duplicate Therapy ^h	0.0	0.0	--	--
No. of drugs on market	--	--	5	5
No. of states	30	30		

SOURCE: Utilization: State Drug Utilization Data files from CMS; Regulation: Author's survey of state Medicaid programs.

Notes:

^dMean number of drugs calculated only for states that have at least one drug in the class subject to regulation.

^eIn 1999, only New Jersey had dose optimization and it places all drugs on market.

^fQuantity Limit is usually in the form of number of units per month while Dose Optimization restricts number of units per day

^gDose Restriction: Specific dosage forms require prior authorization.

^hDuplicate Therapy: Concurrent use of two atypicals/antidepressants requires prior authorization.

Exhibit 4

Effect of Prior Authorization on Utilization of Antipsychotics

Policy	<u>Percent change in # of prescriptions per enrollee</u>	
	Targeted drugs	All antipsychotics**
Prior auth. on a leading atypical	-35.3%	-3.1%
Prior auth. on 2 leading atypicals	-35.3%	-5.9%
Prior auth. on all atypicals	-32.4%	-9.8%

SOURCE: Author's analysis.

Notes: Results are based on models that adjust for initial differences across states, across drug classes, and after the introduction of Part D. All antipsychotics includes typical and atypical antipsychotics