Experience of state drug benefit programs

Cite this article as:
S B Soumerai and D Ross-Degnan
Experience of state drug benefit programs
Health Affairs 9, no.3 (1990):36-54
doi: 10.1377/hlthaff.9.3.36

The online version of this article, along with updated information and services, is available at:
http://content.healthaffairs.org/content/9/3/36.citation

For Reprints, Links & Permissions:
http://content.healthaffairs.org/1340_reprints.php

Email Alertings:
http://content.healthaffairs.org/subscriptions/etoc.dtl

Not for commercial use or unauthorized distribution
To Subscribe:  https://fulfillment.healthaffairs.org

Health Affairs is published monthly by Project HOPE at 7500 Old Georgetown Road, Suite 600, Bethesda, MD 20814-6133. Copyright © by Project HOPE - The People-to-People Health Foundation. As provided by United States copyright law (Title 17, U.S. Code), no part of may be reproduced, displayed, or transmitted in any form or by any means, electronic or mechanical, including photocopying or by information storage or retrieval systems, without prior written permission from the Publisher. All rights reserved.

Not for commercial use or unauthorized distribution
EXPERIENCE OF STATE DRUG BENEFIT PROGRAMS

by Stephen B. Soumerai and Dennis Ross-Degnan

Prologue: The federal government’s recent flirtation with providing an outpatient drug benefit to Medicare beneficiaries has focused Washington’s attention on prescription drugs and the elderly as never before. For many years, state governments, which administer Medicaid pharmaceutical benefits and other state-financed drug benefit programs for the elderly, have been experimenting with various quality assurance and cost containment initiatives. Reflecting the importance that states attach to providing outpatient drugs to the poor people who are eligible to receive Medicaid coverage, all but two states (Alaska and Wyoming) offer such drugs, although they are not required to do so by federal law. In this essay, Stephen Soumerai and Dennis Ross-Degnan discuss the diversity and impact of these initiatives and urge that the federal government pay more attention to lessons learned thus far as it seeks to craft new policy in relation to Medicare and Medicaid. They consider the policy implications of recent well-controlled research focusing on two key questions: (1) What are the intended and unintended impacts of drug cost containment policies, particularly for chronically ill elderly? (2) Can inappropriate prescribing behavior be reduced without affecting essential medical care? They argue for an increased federal effort to produce and disseminate rigorous evaluation research on this topic to policymakers and also draw some tentative conclusions on the risks and benefits of several popular cost-sharing, regulatory, and informational interventions. Soumerai and Ross-Degnan both hold doctor of science degrees from the Harvard School of Public Health. They are currently faculty members of Harvard Medical School’s Department of Social Medicine and are affiliated with the Program for the Analysis of Clinical Strategies at Boston’s Beth Israel Hospital. They lead several federal studies on the relationship between prescription drugs and cost containment, quality of care, and clinical outcomes.
The misuse of medications in the elderly reflects a persistent problem in the delivery of medical services to vulnerable populations in the United States: How to encourage economical use of effective technologies while discouraging ineffective and inappropriate care, which inflates health care costs and exposes patients to the risk of serious iatrogenic, or treatment-induced, illness. Rapidly accumulating evidence of previously unknown risks and benefits of medications among the elderly has helped to fuel a particularly active discussion about pharmaceutical use among concerned consumers, fiscally stretched governments, private insurers, public interest organizations, and a pharmaceutical industry whose product development and profits are at stake. It is hardly surprising that much of the recent debate on how to implement a nationwide drug benefit program for the elderly has revolved more around politics, ideology, and testimonials than around hard data.

Public policymakers seldom have sufficient time to react systematically to fiscal imperatives or legislative mandates; often, the result is a failure to consider previous experience in crafting solutions for pressing health policy dilemmas. As Congress and the Bush administration struggle with new mechanisms to ensure needed drug coverage for the elderly and disabled, they should heed some of the important lessons derived from previous natural and controlled experiments conducted at the state and local level. This information might help avoid the “unintended” quality-of-care outcomes of cost containment experiments or the unnecessary costs of reinventing effective solutions. State governments, along with nonprofit and academic collaborators, have a long and rich history of providing or analyzing drug benefits provided to Medicaid beneficiaries of all ages and to middle-class elderly in pharmaceutical assistance programs for the aged. The purpose of this article is to critically review some of the important policy experiments conducted in statewide drug benefit programs aimed at improving the quality and economy of medication use. We discuss some of the most popular financial, regulatory, and educational strategies, including patient-level copayments and service limits, limited drug lists, and traditional and innovative educational strategies aimed at improving prescribing practices.

**Characteristics Of State Programs And Beneficiaries**

**Programs to cover drug costs.** Drug benefits are provided by states under two programs: (1) Medicaid, which uses federal and state funds to cover a wide range of inpatient and outpatient services to poor elderly, the permanently disabled, and recipients of Aid to Families with Dependent Children; and (2) state-financed programs, which subsidize the purchase of
pharmaceuticals by elderly or disabled individuals who do not qualify for Medicaid benefits but who nonetheless meet mandated income guidelines.

Despite the undeniable effectiveness of many medications in curing or preventing illness, pharmaceutical benefits are considered “optional” services under Medicaid; that is, states have considerable flexibility in deciding whether and how much to pay for prescription drugs. In fiscal year 1987, Medicaid pharmaceutical expenditures in the United States approximated $3 billion, or 6.6 percent of total program expenditures. Only two states, Alaska and Wyoming, do not cover prescription drug costs. However, as we discuss below, Medicaid programs have increasingly implemented cost containment mechanisms and service limitations in an attempt to control drug spending inflation.

**Beneficiaries.** State-provided data show that recipients of old age assistance and the permanently disabled each accounted for 14 percent of eligible patients in forty-eight Medicaid programs in 1987, but they consumed a disproportionately high fraction of drug prescriptions dispensed.

Based on previously unpublished data obtained from the Health Care Financing Administration (HCFA) and state-level data on the number of aged Medicaid recipients, we constructed an eight-year time series of the number of prescriptions dispensed per elderly Medicaid recipient per year (Exhibit 1). To reduce the influence of data errors and outliers, trend lines represent the median value and interquartile range across reporting states.

The median rate was 20.4 prescriptions per elderly recipient per year in 1980; this rate increased to 25.7 prescriptions per person in 1987, substantially more than in the overall population. We found a large variation in

---

**Exhibit 1**

Number Of Prescriptions Per Elderly Medicaid Recipient Per Year, 1980–1987

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


**Note:** The unit of analysis is the individual state. Number of states with complete data: 1980, 44; 1981, 45; 1982, 44; 1983, 48; 1984, 47; 1985, 47; 1986, 44; and 1987, 43.
this rate among states, which could be explained by a number of factors including patient characteristics, physician practice styles, or intensity of reimbursement restrictions.

The high prevalence of multiple illnesses among poor, elderly populations likely accounts for much of this high level of medication use. For example, a large sample of Medicare beneficiaries who rated their health as poor filled an average of thirty-one prescriptions in 1987—six times higher than the rate for beneficiaries reporting excellent health. Besides being chronically ill, elderly Medicaid patients are generally extremely poor, often falling below federal poverty standards (depending in large part on their state’s Medicaid eligibility standards). Nationwide, the average combined state and federal payments in 1986 for an elderly or disabled Medicaid recipient living alone, on Supplemental Security Income (SSI), and without any other income was $384, hardly sufficient to allow excess “disposable income” for significant amounts of health care cost sharing. Perhaps of more concern, those poor and near-poor elderly who are ineligible for Medicaid often do not have any coverage for prescription drugs at all. Based on HCFA and Department of Labor statistics, we calculated that in 1985 a “typical” low-income elderly person had about $36 left each month after paying for such necessities as food, shelter, clothing, and other health care.

In addition to state Medicaid programs, drug benefits are available to other poor, near-poor, or middle-class elderly in nine states. Exhibit 2 outlines the characteristics of seven of these programs in calendar year 1988. These programs are most often financed through general funds and, in some states, lotteries. Most states cover a wide range of prescription drugs for elderly individuals who fall below specific annual income levels (between $6,400 and $15,000 per person).

Based on data reported by the largest program in the nation (Pennsylvania), the average participant increased use from eighteen prescriptions to twenty-five prescriptions annually during the first three years of the benefit. Similar increases have been observed in Mississippi since the advent of the state’s Medicaid program.

Overview Of Cost-Sharing Policies

Throughout the 1980s, state Medicaid and elderly assistance programs experimented with various forms of cost sharing to help finance drug benefits and discourage overutilization. Typically, copayments require patients to pay one dollar per monthly prescription, but in some elderly assistance programs this payment could be as high as four dollars per prescription or 40 percent of prescription costs. Service limits or “drug
### Exhibit 2: Characteristics Of State Drug Coverage Programs For The Elderly

<table>
<thead>
<tr>
<th>Year enacted</th>
<th>New Jersey</th>
<th>Maine</th>
<th>Maryland</th>
<th>Pennsylvania</th>
<th>Illinois</th>
<th>Connecticut</th>
<th>New York</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Eligibility criteria</th>
<th>New Jersey</th>
<th>Maine</th>
<th>Maryland</th>
<th>Pennsylvania</th>
<th>Illinois</th>
<th>Connecticut</th>
<th>New York</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 65+</td>
<td>65+</td>
<td>62+</td>
<td>None</td>
<td>65+</td>
<td>65+</td>
<td>65+</td>
<td>65+</td>
</tr>
<tr>
<td>Means test</td>
<td>$13,650</td>
<td>$6,700</td>
<td>None</td>
<td>$6,400</td>
<td>Less than $12,000</td>
<td>$14,000 per household</td>
<td>$13,300</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Copayment</th>
<th>Drugs covered</th>
<th>Funding</th>
<th>Number of recipients</th>
<th>Cost per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2.00</td>
<td>All legend Rx, insulin test materials</td>
<td>General fund</td>
<td>21,000</td>
<td>$95.3 million</td>
</tr>
<tr>
<td>Up to $1000</td>
<td>Most Rx, heart, blood pressure, diabetes, anti-arthritic</td>
<td>General fund</td>
<td>37,020</td>
<td>$2.0 million</td>
</tr>
<tr>
<td>$1.00</td>
<td>All Rx, Medicaid covered, counter drugs</td>
<td>General fund</td>
<td>470,000</td>
<td>$56.1 million</td>
</tr>
<tr>
<td>$4.00</td>
<td>All Rx, 30-day supply or 100 units</td>
<td>Lottery funds</td>
<td>77,000</td>
<td>$141.5 million</td>
</tr>
<tr>
<td>None</td>
<td>All Rx, Cardiovascular Rx, anti-arthritic, insulin needles and syringes</td>
<td>General fund</td>
<td>31,000</td>
<td>$29.8 million</td>
</tr>
<tr>
<td></td>
<td>All state Rx</td>
<td>General fund</td>
<td>281,335</td>
<td>$9.0 million</td>
</tr>
</tbody>
</table>

| Note: Rx denotes prescription drugs. States with fewer than 20,000 recipients (Delaware and Rhode Island) are not displayed. |
| Unless otherwise stated, figures above are for single persons only. |

Prescription caps,” on the other hand, deny any coverage for medications beyond a predetermined limit, usually three or four prescriptions per month and frequently with a one-month maximum supply. In some cases, the limits are placed at a dollar level, such as twenty dollars per month. Both of these strategies place the burden to economize on the patient rather than on the physician. Such cost-sharing policies appear frequently in Medicaid programs, spurred on in part by the Reagan administration’s cuts in the federal share of the Medicaid budget contained in the Omnibus Budget Reconciliation Act (OBRA) of 1981 (Exhibit 3). By 1988, twenty states had copayments in effect, and twelve states placed caps on the number of prescriptions or expenditures per recipient. In early 1990, the New York State Medicaid program also planned to implement a prescription drug cap.

**Effects of cost sharing.** Evidence in Exhibit 4 suggests that cost sharing and other drug utilization controls do have an impact on overall Medicaid drug expenditures. Before 1981, the average annual rate of increase in nationwide Medicaid drug expenditures per recipient (in constant dollars) was 2.9 percent; from 1981 to 1984, the rate of change in expenditures actually declined by an average of 1.2 percent per year, followed by an increase of 3.1 percent after 1984. Similarly, Exhibit 1 suggests a slight reduction in rates of prescription acquisitions from 1980 to 1982 among elderly Medicaid recipients residing in states with higher-than-average use of medications, followed by increased utilization after 1984. The separate influences of changes in utilization, price, other policy initiatives, and characteristics of the population served cannot be determined in
Exhibit 3
Number Of State Medicaid Programs With Prescription Copayments Or Caps, 1982–1988

<table>
<thead>
<tr>
<th>Year</th>
<th>Copayments</th>
<th>Caps (number/dollar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1983</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>1984</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>1985</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>1986</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>1987</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>1988</td>
<td>25</td>
<td>30</td>
</tr>
</tbody>
</table>

Source: Health Care Financing Administration, Bureau of Data Management and Strategy; and National Pharmaceutical Council.

Note: In 1981, the Omnibus Budget Reconciliation Act (OBRA) reduced federal support for state Medicaid programs and promoted cost containment experiments.

Exhibit 4
Nationwide Medicaid Pharmaceutical Expenditures Per Drug Recipient Per Year, 1975–1987

<table>
<thead>
<tr>
<th>Year</th>
<th>Constant 1975 dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>50</td>
</tr>
<tr>
<td>1976</td>
<td>55</td>
</tr>
<tr>
<td>1977</td>
<td>60</td>
</tr>
<tr>
<td>1978</td>
<td>60</td>
</tr>
<tr>
<td>1979</td>
<td>60</td>
</tr>
<tr>
<td>1980</td>
<td>60</td>
</tr>
<tr>
<td>1981</td>
<td>60</td>
</tr>
<tr>
<td>1982</td>
<td>60</td>
</tr>
<tr>
<td>1983</td>
<td>60</td>
</tr>
<tr>
<td>1984</td>
<td>60</td>
</tr>
<tr>
<td>1985</td>
<td>60</td>
</tr>
<tr>
<td>1986</td>
<td>60</td>
</tr>
<tr>
<td>1987</td>
<td>60</td>
</tr>
</tbody>
</table>

Source: Health Care Financing Administration, Bureau of Data Management and Strategy.

Note: Medicaid expenditures adjusted for inflation to 1975 levels based on the consumer price index (CPI) for prescription drugs, all urban consumers (U.S. Department of Labor, Bureau of Labor Statistics, 1984 and 1989).

such aggregate year-to-year- analyses. Such information can only come from longitudinal analyses in defined populations of elderly patients exposed to specific cost-sharing interventions.

From an economic perspective, cost-sharing approaches are based on the premise that increases in drug prices will stimulate patients to evaluate more carefully the need for medications and thus reduce use of marginal or unnecessary drugs. However, since it is unlikely that many
patients are adequately informed about the efficacy of their medications, they may not be able to differentiate between effective and ineffective care. Thus, the danger exists that needed care will not be received, particularly among poor and chronically ill elderly, who face a much greater relative cost compared to younger adults.

The RAND Health Insurance Experiment provides the most reliable experimental evidence that cost sharing reduces both physician visits and the number of medications received, but these reductions were found to be partly responsible for increases in hypertension observed among low-income adults. However, that study excluded both the elderly and the severely disabled; thus, the observation that most other health outcomes were unaffected by cost sharing cannot be generalized to these groups, who receive many more medications for important chronic illnesses. In addition, since cost sharing was imposed on both outpatient visits and medications, independent effects of drug copayments could not be determined.

What, then, is known about the effect of such financial disincentives on the drug use of elderly and disabled patients? Because of ethical concerns, no randomized controlled experiments are likely to examine this question. Some of the best quasi-experimental evidence of the effects of mild copayments are found in a study of the South Carolina Medicaid population, largely made up of elderly and disabled patients (67 percent). The time series of medication use indicates a small but clearly observable and significant decline in patient-level use of 0.2 prescriptions per patient per month (–11 percent) following the imposition of a small fifty cent per prescription copayment in 1977. The sudden decline in the level of drug use was significantly greater than in a control state (Tennessee), which did not implement any drug cost containment policy.

To what extent do these cost-sharing mechanisms selectively reduce unnecessary care and maintain effective or essential services? Unfortunately, the RAND Health Insurance Experiment suggested that patients were equally likely to withdraw appropriate and inappropriate medications in the face of cost sharing. The South Carolina copayment policy also resulted in a modest decline in prescriptions for effective cardiovascular medications in a predominantly elderly and disabled population.

Effects of payment caps versus copayments. Cost sharing is likely to have its greatest effects on the sickest members of the population. Yet most studies do not separate out chronically ill patients with multiple illnesses, who are most susceptible to financial constraints. Using population-based Medicaid claims data, we recently reported the effects on drug utilization of two successive interventions implemented in the New Hampshire Medicaid program: a three prescription per month payment
limit, replaced one year later by a one dollar per prescription copayment in a continuously enrolled cohort of 860 multiple-drug recipients. This group, predominantly elderly or disabled (83 percent) and female (81 percent), consumed approximately $6.00 per person in prescription medications in the base year. We found that the cap caused a sudden 46 percent, or 2.4 prescription, decline in the average number of monthly prescriptions filled through Medicaid.

A subgroup analysis suggested that most of these medications were not paid for out of pocket; in addition, many patients tended to “stretch” their prescriptions over longer periods of time, a phenomenon similar to that observed by Nicole Lurie and colleagues when medically needy patients lost their Medicaid benefits in California. While marginal or ineffective drugs declined most precipitously (–58 percent), medications deemed essential by a panel of medical experts (such as insulin, lithium, and important cardiovascular preparations) declined by about 28 percent as well.

What is the relative effect of mild copayments versus payment limits on use of the most essential agents in chronically ill populations? We found that recipients of multiple drugs were much more likely to receive essential medications such as insulin under a mild one dollar per prescription copayment policy than under a three-drug cap. Both strategies achieved substantial annual savings in medication costs of between $0.4 and $0.8 million in New Hampshire Medicaid. However, we conclude that mild copayments are preferable to patient-level caps from the perspectives of cost, equity, and quality of life, due to the unknown increases in hospitalization and nursing home admissions and declines in health status potentially resulting from loss of essential medications during the “cap” (the subject of an ongoing study). Nevertheless, more research is needed on possible unintended health effects of even small copayments in the poorest and sickest populations, as are evaluations of the “affordability” of different copayment levels according to income. For example, above what price do near-poor elderly begin to defer purchase of essential medications and stretch their existing supply? These important questions remain, for the most part, unanswered.

**Limited Drug Lists**

One of the most ubiquitous and increasingly popular cost containment strategies is to simply deny payment for specific categories of “marginal” or “nonessential” medications. These restrictions are often characterized as “negative drug lists” and are very different from systematic, “positive” formulary programs undertaken in some hospitals. Such formulary programs employ the concept of “drugs of choice” and carefully select medi-
cations for inclusion when they represent, according to the best scientific and clinical evidence, the optimum among similar medications on the basis of cost, efficacy, or toxicity. This model has not been widely implemented in state drug benefit programs.

By 1988, only four of forty-eight Medicaid programs had completely “open” formularies covering essentially all drugs approved as effective by FDA. The reason for the proliferation of negative drug lists may seem obvious. Without careful examination of empirical data, many cost-conscious legislators assume that the savings attributable to such strategies will be equal to the cost of the drugs eliminated. The problem is that these “savings” are based on three questionable assumptions: (1) that physicians will not substitute other prescription or nonprescription treatments for perceived health problems; (2) that the lack of access to medications will not exacerbate both psychological and physical illnesses, prompting some patients to seek more intensive care; and (3) that patients will not purchase nonreimbursed drugs out of pocket. Unfortunately, the available literature to answer these important questions is scanty and generally of poor methodological quality.

Given the potential economic repercussions of the use of formulary restriction, it is not surprising that the existing literature has been financed in large part by the pharmaceutical industry and tends to focus on cases of unintended substitution of alternative agents that undermine the desired cost and quality objectives of limited drug lists. Most of these studies lack any control group to determine the impact of nonregulatory factors on drug utilization, and almost none adjust for preregulatory trends in drug usage. Nevertheless, some results are suggestive. For example, the removal of minor tranquilizers in one Medicaid program was associated with rises in the use of major tranquilizers, barbiturates (considered unsafe as anti-anxiety agents), and psychostimulants. Similarly, a recent report from Ireland observed that the “delisting” of such minor remedies as antacids, cough medicines, and antihistamines was followed by increases in several more expensive prescription medications, such as histamine-receptor antagonists, presumably used for the minor illnesses previously treated by over-the-counter preparations. In addition, some of the above studies suggest that some low-income patients may continue paying for the nonreimbursable drugs out of pocket, resulting in public/private cost shifting to those who may be least able to afford the added expense. These results must be interpreted cautiously, however, due to small sample sizes, lack of control groups or preexisting trends in prescribing of substitutes (which often show increases in utilization due to marketing or other factors), and selection of small numbers of drug categories in each study.
To overcome many of the above problems, we recently conducted a large time-series study (using 390,465 patients), which evaluated the drug utilization and cost effects of the sudden withdrawal from reimbursement of twelve categories of scientifically unsubstantiated drugs in the New Jersey Medicaid program. Although withdrawn drugs accounted for 7 percent of prescriptions dispensed in the base year, there was no measurable reduction in programwide drug use or expenditures after the regulation was implemented. Further, reductions in use of study drugs were offset by increases in a variety of substitute drugs, which varied substantially in cost and efficacy. For example, patients regularly receiving irrational fixed-ratio combinations of theophylline and barbiturates in the year prior to the policy received increased numbers of prescriptions for bronchodilators without sedatives, representing a likely improvement in therapy. However, recipients of cerebral vasodilators were often switched to papaverine or ergoloid mesylates, both poorly effective and costly treatments for these conditions. These findings suggest that simple regulation may prevent use of specific marginal health services; however, if such policies do not address underlying educational needs or behavioral factors causing inappropriate prescribing (for example, patient demand and intentional use of active placebos), they may have unintended consequences. A promising strategy may be to combine restrictions on irrational agents with prescribing guidelines and education encouraging appropriate use of replacement therapies.

The potential positive and negative effects of limited lists on the quality and outcomes of care is a field ripe for more rigorous and objective analysis. Unfortunately, the most often referenced report of such “adverse effects” is methodologically inadequate. The study purports to show sizable increases in hospitalization rates for conditions generally unrelated to withdrawn drugs and in a sample of Medicaid recipients who were never shown to use the drugs in the first place. Further, it is quite possible that rates of hospitalization were different between the study and comparison states even before the drug restriction policies in question. Despite these limitations, a recent study published in a respected health services research journal accepted the results of this unpublished report without question. Clearly, there is a need for more rigorous examination of both the intended and unintended economic and quality-of-care effects of negative drug lists before their widespread implementation in drug benefits programs.
or poor-quality prescribing, placing much of the burden on relatively uninformed patients to decide which treatments to continue or forgo. Rather than restricting choice or placing economic obstacles on those least able to surmount them, some health policy analysts have emphasized the need to upgrade the clinical decision making of physicians—the primary gatekeepers to prescription drug use in the elderly. There is abundant evidence that physician training in therapeutics, continuing medical education, and prescribing for the elderly are not sufficient. Here we review what lessons can be derived from the state-level experiments to improve prescribing practice.

**Medicaid drug utilization review activities.** Virtually all Medicaid programs maintain computerized information systems containing patient-specific data on the identity, dose, date of dispensing, quantity, and frequency of all prescriptions; demographic characteristics of all Medicaid recipients; and use of other medical services. These data can be linked with specific identified providers (or groups) categorized by location, specialty, or board certification to identify potentially uneconomical or poor-quality drug utilization patterns. A major question is whether this database has been effectively put to use to identify and improve patterns of prescribing.

Recently, the Department of Health and Human Services (HHS) Office of the Inspector General issued a report of a survey of drug utilization review activities in forty-eight Medicaid programs. The report concluded that, at the prepayment level, drug utilization review activities were not relevant to the most pressing problems of prescribing to geriatric and disabled patients. For example, they noted that the majority of programs emphasized fraud and abuse by individual recipients and, to a lesser extent, abuse of the system by health practitioners. Most often, these cases involved the use of narcotics and controlled substances—problems that are less likely to be patient-initiated in an elderly population. In addition, a common strategy has been to implement computerized screens, which eliminate payment for nonformulary drugs, duplicate billings, and excessive medication supplies.

At the postpayment level, the large prescription data sets can be analyzed to identify the most critical drug utilization problems (from a cost, efficacy, or safety perspective) by region or physician. These data could then be used to develop carefully targeted feedback or educational programs to encourage physicians to change these patterns of prescribing. For example, it has been shown that long-acting tranquilizers are particularly toxic for elderly patients and may produce numerous adverse effects, including an increased risk of falls and hip fractures. Physicians with many elderly patients on such therapies could be targeted for...
educational programs; furthermore, the Medicaid data could then aid in evaluating changes in practice patterns. Only a few programs have used these retrospective data to implement such educational programs, although this was the most frequently cited need expressed by Medicaid administrators in the survey.

Some Medicaid programs have gone one step further than these efforts and have implemented computer-generated drug use review and feedback programs. These programs typically screen Medicaid claims and eligibility files for possible instances of inappropriate drug use, such as contraindicated drug combinations, over- or underuse of specific medications, or therapies contraindicated by diagnosis. Specific cases in which patients are given nonindicated therapy are transmitted to a peer review committee for case-by-case review. The committee confirms problematic prescribing and sends written inquiries to the responsible physician questioning the prescribing practice and asking for a written response.

Although this system has been implemented in many states, the claims of efficacy are based on studies with one-group, post-only research designs, which tend to report impressive statistics when in fact the findings are also consistent with a hypothesis of little or no effect. For example, in one state, it was reported that slightly over 50 percent of prescribing problems observed in individual patients were eliminated following feedback; yet no adjustment was made for physicians who discontinued the drug long before receiving any letters. The absence of any population controls thus makes such efficacy claims highly suspect. Further, since the vast majority of cases failing screens are never confirmed or acted upon by the peer review committee, it is not clear whether such a case-by-case retrospective approach can be as cost-effective as broader strategies aimed at physician-level patterns of prescribing. Finally, the regulatory nature of the physician-level oversight may reduce its effectiveness in comparison with more supportive educational approaches that aim for greater adherence to overall prescribing guidelines.

Other prescribing improvement strategies. Over the past two decades, published reports have abounded describing the effects of informational, educational, and administrative strategies to improve prescribing in a variety of settings. Some of these programs have used Medicaid data or similar administrative data sets to target high-priority problem areas and physicians in need of education, and have measured the effectiveness and efficiency of these programs. We completed critical reviews of the methods and results of the experimental and quasi-experimental literature in both hospital and outpatient settings, to identify the most promising strategies for improving prescribing practices. We reviewed forty-two experiments in primary care settings, of which approximately 60 percent
met our research design standards necessary for inclusion. In the inpatient setting, only nine of thirty-one studies were adequately controlled. Nevertheless, where adequate numbers of high-quality studies exist, several findings tend to be consistent.

1. Seven well-controlled studies confirm that mailed educational materials, when used alone—including drug therapy guidelines, protocols, drug bulletins, self-education curricula, or commercially prepared and attractive brochures—may affect knowledge but have little or no effect on the prevalence of inappropriate prescribing practices. Attesting to the importance of adequate controls, it is interesting to note that all such studies in the outpatient setting with inadequate research designs report positive effects of print-only interventions, while all well-controlled studies show no effect of simple information dissemination. However, as described below, high-quality educational materials are important components of other broader educational strategies, particularly those including person-to-person communication from respected drug therapy counselors.

2. Simple feedback strategies, involving the distribution of computerized “profiles” or lists of each patient’s medications to physicians, have had no effect on reducing either irrational prescribing (that is, duplicate or interacting drugs) or overall drug utilization and costs. It has been suggested that the lack of explicit suggestions for improvements in practice, coupled with the large volume of computerized information provided to physicians, may have acted as barriers to their effectiveness.

3. In group practice settings, ongoing retrospective feedback of physician-specific prescribing performance, communicated by influential physicians, has been shown to increase the use of generic drugs. However, no adequate study has tested this approach in single-office settings where physicians are more insulated from ongoing peer review and discussion. In addition, in the pharmaceutical area, there has been no adequate study of John Wennberg’s approach of feeding back data on local area variations to medical societies. However, a recent controlled study in the hospital setting has failed to demonstrate any effect of notifying physicians of variations with their peers in the amount of overall antibiotic expenditures.

4. In academic group practices, small group tutorials conducted by senior physicians have increased the appropriate use of antibiotics and improved hypertension treatment.

5. Several studies in health maintenance organizations (HMOs) and hospital primary care settings have provided evidence that ongoing computerized reminders can prevent physicians from underprescribing essential preventive therapies, such as antibiotics following laboratory
confirmation of streptococcal infections and appropriate agents for hypertension.\textsuperscript{40} Since such improvements have been shown to deteriorate after cessation of reminders, it has been suggested that these approaches are effective for correcting errors of omission rather than incorrect beliefs. No data are available on the effectiveness of this approach targeted at overuse of medications.

(6) Several large studies, using Medicaid data from five states, are consistent in reporting that brief one-on-one educational visits by either medical school–affiliated clinical pharmacists or medical society–based physician/counselors can reduce inappropriate use of a wide range of medications for peripheral vascular disease or senile dementia, mild to moderate pain, bacterial and viral infections, and nervous conditions.\textsuperscript{41} These effects were consistent across age, specialty, and rural versus urban practice and were shown to persist for up to two years. Such behaviorally based approaches are potentially broader in scope than are many of the regulatory interventions described above because they concentrate not only on reductions in inappropriate prescribing, but also on positive inducements to provide cost-effective and safe alternative treatments (such as aspirin for the marginally effective analgesic propoxyphene).

An important question not answered by most studies conducted to date is the potential for such programs to achieve savings that exceed the costs of intervention. Only one formal economic analysis of a large randomized controlled trial has been conducted to date.\textsuperscript{42} This study indicated that when a prescription claims database was used to target moderate to high prescribers of three specific often-overused medications, the savings-to-cost ratio for the small group of drugs in Medicaid could be as high as 3:1. Savings to private-pay patients and other insurers were excluded from this analysis; nor do these estimates include the reduced risk of adverse effects associated with reductions in use of toxic and addictive medications such as propoxyphene.

**Policy Recommendations**

This article has examined the impacts of some of the more popular cost containment options, formulary restrictions, and educational and information strategies implemented by state programs to improve the quality and economy of medication use. The findings have several important implications for selection and implementation of rational policy strategies, and for the monitoring and evaluation of their impacts. However, before making any specific policy recommendations, we discuss some general issues highlighted by the paucity, poor quality, and apparent lack of impact of much of the existing research.
There is a notable lack of coordination between state drug benefit program policymakers and those investigating the results of previous policy initiatives. Fiscally strapped Medicaid programs are reluctant to allocate scarce local resources to the policy research process necessary to make informed decisions. Historically, this research has been carried out in a more or less haphazard manner with no comprehensive agenda, typically by academic or private research groups who are removed from the policy process and whose funding depends either on industry or on occasional government and foundation support. Even when policy-relevant results have been produced, there have been no timely mechanism and no funding to disseminate them to state and local decisionmakers. This void must be filled, given the important economic and clinical consequences of over- and underuse of medications.

Much as it is essential to find strategies to disseminate empirically derived medical practice guidelines to physicians, so it is equally important to produce and disseminate policy-relevant knowledge to those concerned with the shape and substance of public drug benefit programs. There needs to be a government-financed national mechanism for defining the priority drug policy research needs, for promoting funding strategies to see that this research is carried out, and for disseminating results to state and local policymakers. Perhaps this could take the form of an expert panel of federal and state drug program administrators, clinicians, health services researchers, industry representatives, and consumers working under the auspices of HCFA and the Agency for Health Care Policy and Research, but with established linkages to federal and state drug benefit programs.

Medicaid and state drug benefit program databases, possibly linked with existing Medicare files, represent powerful tools for identifying groups of high-risk beneficiaries, for locating prescribers with specific educational needs, and for evaluating the effects of policy interventions. However, such databases are not being exploited to their full potential, due both to a lack of resources devoted to this process and to a lack of technical expertise and simple computer systems for carrying out these studies in a timely and efficient manner. One function of the national expert group might be to identify specific drug policy issues for which these data resources might be most effectively used.

In the development of a coherent set of research priorities, some basic questions remain unanswered. First, what are the health and economic impacts of drug benefits for vulnerable groups, in terms of health outcomes, quality of life, and expenditures on other forms of medical care? Second, what combination of administrative and educational strategies is most feasible and cost-effective in improving quality of care and reducing un-
necessary expenditures? Since much of the existing work has emphasized the aggregate economic impact of policy changes, there is a particular need to focus on the effects of policy on patient-level quality of care, especially for those chronically ill elderly and disabled who are most in need of drug coverage but who are also most at risk of inappropriate medication use.

More evaluation studies are needed to understand the effects of formulary restrictions or of the many policies aimed at containing drug reimbursement. Policymakers have an ethical responsibility to evaluate both intended and unintended consequences of specific strategies. It is sobering to note that some of the most popular policies would probably fail to pass the patient risk provisions of human subject reviews required in National Institutes of Health (NIH)-funded research. At the very least, those strategies that can potentially reduce essential care in high-risk populations or that will be expensive to implement should undergo careful evaluation before widespread adoption. For example, the prospective, point-of-sale drug utilization review systems required in the recently abolished Medicare catastrophic drug coverage program or in the proposed amendments to the Social Security Act on Medicaid drug prices and quality should be tested rigorously for feasibility and cost-effectiveness before being mandated.

Research standards and methods in this area need substantial upgrading. It is natural and legitimate that pharmaceutical companies wish to demonstrate that certain cost containment policies could limit use of particular effective products and may result in unintended increases in use of other medical services and declines in health status. However, some commercially funded research has resulted in flawed and clearly biased conclusions.43 The interests of the pharmaceutical industry and society might be best served by creating a centralized source of private funding for pharmaceutical policy research, but with the allocation of research funds decided by peer review of the scientific and policy merit of proposals, perhaps conducted by a private nonprofit organization such as the Association for Health Services Research. Such a change in funding strategy would improve the quality of drug policy research and more clearly indicate the potential benefits and risks of changes in reimbursement policy.

Specific policy recommendations. Based on the limited evidence cited above, several specific policy recommendations could reduce the cost of drug benefits while maintaining or improving quality. State drug benefit programs should avoid placing arbitrary caps on patient-level medication use (for example, three prescriptions per month). These strategies have the potential to reduce access to essential medications; they could be associated with important declines in health status and, ultimately,
increases in the use of more intensive substitute services, such as hospitalization and nursing home admissions. Early data from our study of the clinical outcomes of drug payment caps among low-income, chronically ill elderly suggest that maintaining or expanding (rather than contracting) drug coverage for these populations may reduce the risk of expensive and unnecessary nursing home admissions.\textsuperscript{44}

Second, if some cost sharing is required to help finance benefits, mild copayments (for example, one dollar per prescription) may act as a modest disincentive to marginal utilization. This type of cost sharing has less impact on chronically ill populations, and resulting reductions in reimbursement may help to finance Medicaid or other benefit programs.

Third, state programs may wish to cooperate in the development of a consistent and coordinated educational outreach program to continuously improve the quality of prescribing. Educational models could include face-to-face “academic detailing,” ongoing computerized reminders, audit-based feedback, or other innovative means of communicating prescribing guidelines.\textsuperscript{45} Such experimental programs have been cost-effective and acceptable to practicing physicians, especially when they are carried out in a nonthreatening, supportive manner and when they emanate from credible, unbiased professional organizations.

---

NOTES


10. Soumerai et al., “Payment Restrictions for Prescription Drugs in Medicaid.”
15. Lohr et al., “Use of Medical Care in the RAND Health Insurance Experiment.”
17. Soumerai et al., “Payment Restrictions for Prescription Drugs in Medicaid.”
19. Soumerai et al., “Payment Restrictions for Prescription Drugs in Medicaid.”


35. Ibid.

36. Soumerai et al., “Improving Drug Prescribing in Primary Care,” and Soumerai and Avorn, “Efficacy and Cost-Containment in Hospital Pharmacotherapy.”


42. Soumerai and Avorn, “University-based Drug ‘Detailing’.”

43. Hefner, “A Study to Determine the Cost-Effectiveness of a Restrictive Formulary.”

44. S.B. Soumerai et al., “Medicaid Drug Payment Limits as a Cause of Institutionalization and Hospital Use” (Abstract presented at the 1990 Annual Meeting of the Association for Health Services Research, Arlington, Virginia, 19 June 1990).

45. Soumerai et al., “Improving Drug Prescribing in Primary Care.”