Participation and Crowd-Out in a Medicare Drug Benefit: Simulation Estimates

Dennis G. Shea, Ph.D., Bruce C. Stuart, Ph.D., and Becky Briesacher, Ph.D.

This article provides information on likely participation in the Medicare prescription drug plan and expected crowd-out. We use a microsimulation model based on data from the MCBS to estimate the costs and benefits of a Medicare drug plan, including the benefits from reductions in risk. The simulations are repeated using different combinations of benefits and subsidies. In addition, the simulations explore the effects of different behavioral parameters for moral hazard (the extent to which participants increase drug spending in response to reduced costs) and risk aversion (the extent to which participants would be willing to pay to avoid risk) to identify the impact of these factors on participation and crowd-out.

INTRODUCTION

Numerous studies have examined the total costs of a Medicare prescription drug benefit, however, few have focused on the expected participation of beneficiaries under a voluntary plan or the extent that the new offering will crowd-out existing forms of coverage. This information is important for three reasons. First, identifying who is likely to enroll in the Medicare drug plan provides important insights into who is likely to benefit and who is likely to be left behind. It is currently unclear how much a Medicare drug plan would assist key groups with few current opportunities for coverage, such as beneficiaries living in rural areas, near-poor households, and those with significant chronic health problems. Second, understanding crowd-out is essential if the intention of the Medicare drug benefit is to increase overall insurance coverage rather than merely replace private drug coverage. Concerns about the possibility that employers would drop prescription drug coverage, evident in an early U.S. Congressional Budget Office assumption that three-quarters of persons currently covered by retiree health insurance prescription drug plans would drop their plans, grew during policy discussions (Crippen, 2000). The final bill includes subsidies to employers to maintain their prescription drug coverage for retirees. Clearly, the cost of and participation in the Medicare drug plan will depend on the degree that existing forms of drug coverage are maintained.

BACKGROUND

Nearly all research into crowd-out examines the relationship between private health insurance and Medicaid eligibility expansions for children and pregnant women. The work characterizing employer responses to the public program expansions is particularly relevant. Medicare drug benefit proposals have provided incentives to prevent employers from reducing retiree drug coverage, although that process is already underway (Stuart et al., 2003). Cutler and Gruber (1996b) found no evidence of

Dennis G. Shea is with Pennsylvania State University. Bruce C. Stuart and Becky Briesacher are with the University of Maryland School of Pharmacy. The research in this article was funded by The Commonwealth Fund. The views expressed in this article are those of the authors and do not necessarily reflect the views of Pennsylvania State University, University of Maryland School of Pharmacy, The Commonwealth Fund, or the Centers for Medicare & Medicaid Services (CMS).

employers choosing to forego offering insurance benefits resulting from eligibility expansions. Rather, crowd-out resulted from enrollees' dropping private coverage to take up public coverage. A more recent study assessed the effect of the Medicaid expansions on the offer decisions by small firms. Shore-Sheppard, Buchmueller, and Jensen (2000) used a two-stage estimation technique to assess how the availability of Medicaid coverage affects the firm decision to offer health insurance to workers, plan generosity, and the take-up decision by workers who are offered health insurance benefits. They find that Medicaid eligibility expansions did not affect the insurance offer decision by small (up to 100 employees) firms. However, the authors do find evidence of crowd out occurring at the level of plan generosity. Finally, Dubay and Kenney (1997) highlight the important fact that crowd-out varies among the different subgroups of the population. They obtained crowd-out estimates of 27 percent for pregnant women with incomes between 100-133 percent of the Federal poverty level (FPL), but estimates of 59 percent for pregnant women with incomes between 134-185 percent of the FPL. These results suggest that crowd-out effects increase significantly with income. Rask and Rask (2000) also find evidence of crowd-out of private insurance where the magnitude of crowd-out varies in relation to income level.

Thus, research on Medicaid and crowd-out suggests that some collapsing of the private insurance market is likely and that a primary source may be the response of individual Medicare beneficiaries, rather than their employers. Research also suggests that crowd-out will vary among different population groups.

DATA AND METHODS

Our study differs from the previous Medicaid studies (Cutler and Gruber, 1996a and 1996b; Shore-Sheppard et al., 2000; Dubay and Kenney, 1997; Dubay, 1999; Rask and Rask, 2000; Blumberg, Dubay, and Norton, 2000) since we are examining a policy not yet in effect, rather than analyzing one already in place. In this section we provide an overview of our model, followed by details on the simulation of plan participation. The other components of the model are then described.

Model Overview

The basic components of our model include a base case data set, a spending model, and a participation model. The base case data is a relatively simple inflation of data from the 1999 MCBS to the year 2004[1] based on trends in income, population, and spending. The spending model estimates the impact of a given prescription drug plan on each individual's drug spending. Those estimates depend on the features of the plan (e.g., deductibles, coinsurance) as well as behavioral assumptions about the impact of drug coverage on drug spending.

The participation model estimates whether an individual decides to participate in a Medicare drug benefit. Those estimates depend on estimated out-of-pocket drug spending with and without the Medicare plan, estimated drug plan premiums with and without the Medicare plan, estimated benefits from reduced drug costs risk, and assumptions of individual's preferences for avoiding risk.

[1] Estimates for 2004 using the 1999 MCBS were the latest available data when this article was prepared. Preliminary comparison to 2006 estimates suggests main effects are similar.

Table 1

Decision Rules Used to Determine Whether Medicare Beneficiaries Choose to Take Up Prescription Drug Benefit

Base Case Coverage and Premium	Enroll If	Do Not Enroll If
Full Premium Subsidy		
Any public coverage with or without private coverage(no premium for any coverage) Private plan(s) with no out-of-pocket premium	Base case third-party spending < Medicare [spending – premium] + risk premium	Base case third-party spending > Medicare [spending – premium] + risk premium
Partial Premium Subsidy		
Any combination of plans with any out-of-pocket premium payment (except sole coverage under a Medigap plan)	Base case (third-party spending /2] < Medicare [spending – premium] + risk premium	Base Case (third-party spending /2] > Medicare [spending – premium] + risk premium
No Premium Subsidy		
Medigap and no other public or public plan No prescription coverage	Medicare [spending – premium] + risk premium > 0	Medicare[spending – premium] + risk premium < 0

SOURCE: Shea, D.G., Pennsylvania State University, Stuart, B.C., and Briesacher, B., University of Maryland School of Pharmacy, 2004.

Simulating Plan Participation

Our guiding principal in projecting plan participation (or take up) is that beneficiaries who would fare better under the new drug plan will enroll, but those who would fare worse will not. We assume that beneficiaries compare their well-being if they choose to enroll in a Medicare drug plan to their well-being if they choose not to enroll. These comparisons are summarized in Table 1, detailed by the beneficiary's initial level of drug coverage.[2]

We assume that beneficiaries compare the net value of their current coverage (if they have any) to the net value of the new Medicare coverage. The net value of any plan (existing coverage or a new Medicare plan) includes the drug expenditures paid on their behalf by the third party minus any policy premium for which they are responsible plus any benefit from risk reduction. The estimates of third-party payments come from the expenditure model and are described later.

Unfortunately, the MCBS only provides information on whether the beneficiary pays none, some, or all of the premium for their current drug coverage. To estimate existing premiums for persons who have prior drug coverage, we assigned beneficiaries into three categories on the basis of current coverage: full subsidy, partial subsidy, and no subsidy according to the source of coverage and whether the beneficiary paid any premium. Source of coverage tells us where subsidy levels are 100 percent, as in public programs, or zero percent, as in Medigap plans, and where individuals have no coverage at all. Source of coverage is less telling with employer or HMO plans where the subsidy can vary from 0 to 100 percent. The distinction is important, as people receiving high premium subsidies are more likely to keep their base case coverage than those with low premium subsidies. For these cases, we examined whether the person paid a premium. If they paid no premium and had coverage from an employer or HMO prescription plan, we assigned them to the full premium subsidy category. If they paid any premium amount and had one of these sources of coverage, we assigned them to the partial subsidy category. In the absence

[2] This comparison assumes that individuals have a reasonable ability to predict their future drug expenditures. That assumption rests on research showing that past drug use among aged individuals predicts future use reliably once coverage has stabilized (Stuart and Coulson, 1993; Coulson and Stuart, 1992; Stuart et al., 1991).

of any data on actual subsidy levels, we arbitrarily assumed that all persons in this category received a subsidy of 50 percent.

The net benefit for an individual also depends on the premium for the Medicare drug plan. Since many Medicare prescription benefit proposals include varying levels of premium subsidy, we incorporate these subsidies into our participation model.

To estimate the base premium for a Medicare prescription benefit we assume that community-rating rules apply and no applicant willing to pay the premium can be turned down. Under community rating, all enrollees pay the same price regardless of their risk-related characteristics. We compute the premium under the assumption that the premium is set in an actuarially fair manner by private carriers with no Federal subsidy for adverse selection. We term these, risk-adjusted community rates. We estimate these rates using a recursive decision rule to find an equilibrium premium, because the premium depends on who is in the pool and the premium determines whether the person decides to enroll. In brief, we first compute a premium estimate for the plan to be simulated based on the assumption that all Medicare Part B enrollees choose to enroll in the prescription plan. We then offer the plan to the beneficiaries at that premium and estimate participation. After determining participation, we recompute the plan premium and offer the new plan and premium to beneficiaries. Once again, we estimate participation at the new premium. We continue this process until there are no changes in either the premium or the plan enrollment. This recursive model ensures the total premiums sum to total spending in the Medicare plan.

The last component of the participation model is the measure of the benefit from reduced risk, known as the risk premium. This depends on an assumption about individual attitudes toward risk and estimates of the effects of different drug plans on the variance in drug spending. In most models, we assume a moderate level of risk aversion among Medicare beneficiaries (risk aversion set at -0.0003). To test the effects of assumptions about risk aversion, we estimate models holding constant the plan features and vary the risk aversion parameter from -0.0002 to -0.0003 to -0.0004.

Two variances are needed to compute the risk premium for each simulation, the variance of spending in the absence of Medicare drug coverage and the variance in spending in the presence of Medicare drug coverage. We estimate these variances by measuring the variance in drug spending for all persons by source of coverage under the base case and under each simulated drug plan. The reduction in variance under the Medicare plan is multiplied by the risk-aversion factor and other parameters in the Pratt (1964) formula to identify the risk premium. In some instances, variance under the Medicare plan was approximately equal to or greater than variance under the base case. Risk premiums for these individuals were set equal to zero.

To summarize, we estimate the net benefit to each individual for their existing drug coverage and the Medicare plan. Those benefits are based on estimated third-party benefits, estimated premiums, and estimated risk reduction from the plans. If the benefits of enrolling in the Medicare drug plan exceed those of the existing coverage, the person enrolls in the Medicare plan and we adjust their spending with the spending model. If not, the person declines enrollment and their spending remains the same as estimated by the base case model.

Spending Model

The spending model first determines whether the Medicare prescription drug plan being simulated represents better coverage to beneficiaries than their current prescription plan (if they had one). Our definition of current coverage value is the effective coinsurance rate measured as the ratio of base case out-of-pocket prescription expenditures to total prescription expenditures. If this effective coinsurance rate were greater than the rate in the simulated plan (meaning that the Medicare plan coverage is better than current coverage), we applied an insurance inducement factor to capture the effect of the new coverage on individual drug spending levels. If the base case effective coinsurance was below the coinsurance rate of the Medicare drug plan being simulated, we reasoned that the new benefit would not reduce the beneficiary's out-of-pocket obligation and no additional drug spending is induced.

The next step of the spending model is to identify and apply the insurance inducement effect. The primary challenge to all non-experimental efforts to estimate the impact of insurance on the demand for covered services is that individuals may select into (or out of) coverage because of unobservable characteristics related to their needs. We estimated three models to project insurance inducement effects. The first is a naïve ordinary least squares regression of insurance duration (full and part year) and demographic factors on drug spending. We label it naïve because no attempt is made to control for selection effects. The second method is a standard two-stage selection bias-corrected regression. The third is a panel random effects model using 2 years of data from each individual rather than just one as in the first two methods. The data for the panel model came from a previous study by the authors using 1995-1996 MCBS data (Stuart, Shea, and Briesacher, 2001). The individual random effects and covariates control for measured and unmeasured differences among individuals that can impact spending, including that associated with selection. In all of these models, we find a statistically significant insurance inducement effect on prescription drug spending of relatively similar magnitude (approximately -0.5). We estimate a set of alternative simulations in which the elasticity is varied between -0.25, -0.5, and -0.75 to test the sensitivity of this assumption.

To apply the insurance inducement factor under various cost-sharing provisions we begin with a preliminary estimate of induced prescription spending for each person based on the difference between the base case coinsurance rate and the one specified by the Medicare drug plan being simulated and the assumed inducement effect. That preliminary estimate is then adjusted depending on additional plan features such as deductibles, out-of-pocket maximums, and donut holes (gaps in coverage above the deductible and coinsured areas and below the out-of-pocket maximum).

For example, take a plan with coinsurance of 50 percent, a $250 deductible, a $2,000 spending cap, and a $6,000 stop-loss for someone who has no existing (base case) coverage. Under this type of plan, the individual would face full costs for the first $250, 50 percent of the next $4,000 of spending, full costs of the next $3,750 ($6,000-$2,000-$250), and then none of the costs above $8,000 ($250+$4,000+$3,750).

We first compute the level of spending that would be induced by this plan simply on the basis of the change in coinsurance (from 100 to 50 percent), giving us two levels of spending for this individual: base case and preliminary induced. Individuals with induced spending below $250 face no

effective price reduction from the plan and we reset their final spending estimate equal to their base case spending. Persons whose preliminary induced spending exceeds $250, but below $4,250 face a lower marginal price of 50 percent, and we set their final spending equal to the preliminary induced amount. For persons in the donut hole with preliminary induced spending and base case spending above $4,250, but below $8,000, we assume that they will perceive that their effective price will only be reduced on the first $4,250 of spending, so we adjust their preliminary estimate downward to get their final induced spending. Finally, persons with more than $8,000 in annual drug spending will face additional inducement for all purchases above that level since these are obtained at a zero marginal price. An additional induced amount is added to their preliminary induced level of spending to create their final induced spending.

To summarize for persons choosing to enroll in a Medicare drug plan, individual base case spending is increased based primarily on the change in the percentage of drug costs they are estimated to bear. This amount is adjusted up or down, depending on whether the estimated increase in spending places them in a range where additional features of the drug plan will require them to bear a greater or lesser amount of the costs. For persons choosing not to enroll, spending remains at the base case level.

Base Case Model and Additional Details

Our data source is the 1999 MCBS, a nationally representative longitudinal panel survey of Medicare beneficiaries conducted by CMS which collects extensive information on individuals' use and expenditures for health services, health insurance, health and functional status, and sociodemographics (Centers for Medicare & Medicaid Services, 2002). Our sample includes all community-residing respondents in the MCBS. We begin with a base case scenario created from projections of the 1999 MCBS data to CY 2004. The base case portrays prescription use and coverage in 2004 under current Medicare Program rules. Base case projections include changes in the Medicare population, beneficiary income and poverty status, and inflation in prescription drug expenditures, as well as estimated underreporting of prescriptions in the MCBS. These figures are not adjusted for any changes in the private insurance marketplace between 1999 and 2004.

The base case population includes community-dwelling Medicare beneficiaries with at least 1 month of enrollment in Medicare Part B. We exclude institutionalized beneficiaries because the MCBS does not capture their drug expenditures. These institutionalized beneficiaries comprise about 5 percent of the total Medicare population. Anecdotal evidence suggests that institutionalized beneficiaries have approximately double the prescription expenditures of community-dwelling beneficiaries. If so, our simulation represents approximately 90 percent of the total Medicare beneficiary drug spending.

To project the beneficiary population, we inflated each person's MCBS cross-sectional weight by an inflation factor, which represents the projected overall growth in the Medicare population during the period (Moon, 2003). We inflate the reported MCBS income by the annualized rate of increase in median household income for householders age 65 or over between 1997 and 1999 from the Current Population Survey. We followed the computations for

calculating the 2001 poverty guidelines to calculate estimated poverty guidelines for 2004 (U.S. Department of Health and Human Services, 2002).

The base case scenario holds prescription coverage rates constant at 1999 levels. Our prior analyses of prescription drug coverage (2000) shows a steady increase between 0.7 and 3.6 percent per year in the number of beneficiaries having prescription drug coverage at some point during the year. Between 1997 and 2002 the number of Medicare beneficiaries with prescription drug coverage in M+C plans declined (Laschober et al., 1999; Cassidy and Gold, 2000). This trend in combination with retrenchment in retiree health benefits in recent years suggests prescription coverage of Medicare beneficiaries may have peaked in 1999.

To get base case prescription drug spending, we inflate each individual's spending with an inflation factor derived from two main components. First, an underreporting adjustment of 1.159 is applied to spending. A recent CMS study by Poisal (2001) suggested that prescription drug spending is underestimated by 15.9 percent in the MCBS. By contrast, the Actuarial Research Corporation (ARC) applied a 10-percent underreporting adjustment (Fuchs et al., 2000) and the U.S. Congressional Budget Office applied a 25-percent adjustment. The second component of the inflation factor is derived from the national health expenditure actual and predicted levels for drug expenditures for the U.S. population from 1999 to 2004.

RESULTS

Table 2 illustrates the model's projection of Medicare drug spending under the assumption of no additional prescription plan. According to the model, approximately one-fifth of the Medicare population would be without prescription drug coverage. Total spending would exceed $90 billion with almost 40 percent of that spending being made by beneficiaries in out-of-pocket costs (that does not include prescription drug premiums).

Table 2

Projected Spending on Prescription Drugs, by Medicare Beneficiaries: 2004

Spending	Billion
Total Spending on Prescription Drugs	$91.1
Medicare Spending	0.1
Other Third-Party Spending	55.3
Out-of-Pocket Spending	35.8

NOTE: These projections are forecasted assuming there is no additional prescription plan.

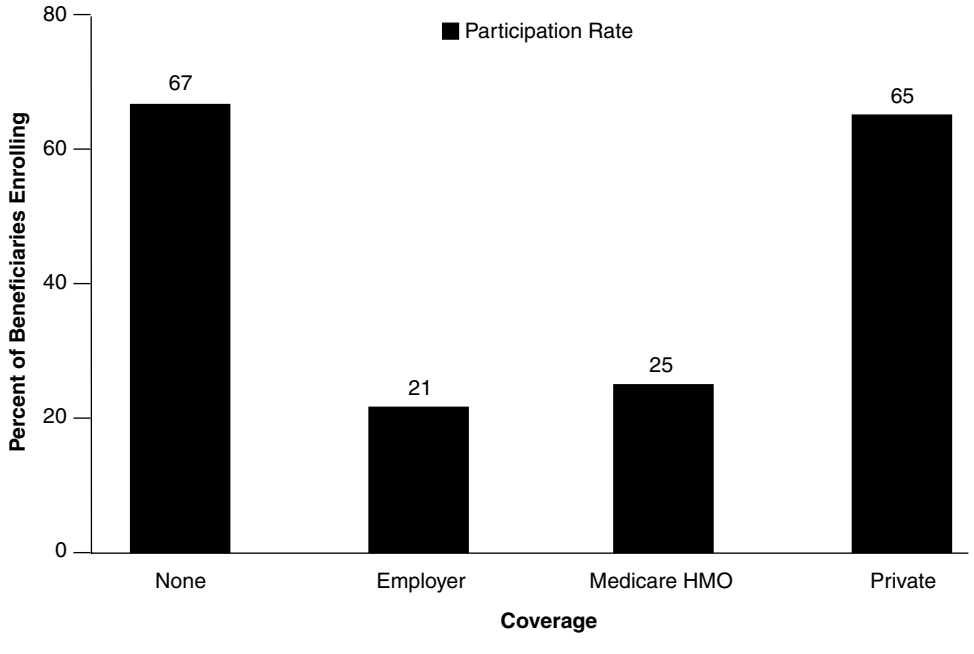
SOURCE: Shea, D.G., Pennsylvania State University, Stuart, B.C., and Briesacher, B., University of Maryland School of Pharmacy, 2004.

We then simulate the addition of a Medicare prescription drug plan which has the following features: a $250 deductible; coinsurance of 50 percent for spending between $250 and $2,000; donut of 100 percent coinsurance between $2,000 and $4,800; stop-loss at $4,800 (total spending, which would be $3,925 out-of-pocket); full subsidy for persons with income <150 percent of the FPL; partial subsidy (linear decline) for persons between 150 and 175 percent of FPL; no subsidy for persons above this level.

Under this scenario, total prescription drug spending by the Medicare population increases by almost 11 percent to over $108 billion. Overall, participation in the Medicare plan is 41 percent. Figure 1 shows how participation varies according to prior coverage of the enrollee. The figure indicates that with no subsidy offered to higher income participants, crowd-out of the usually generous employer and Medicare HMO plans would be small, with less than one-quarter of persons with those types of coverage switching from their existing coverage to the Medicare plan. On the other hand, even in the absence of a subsidy for persons with higher income,

Figure 1

Medicare Prescription Drug Plan Enrollment Rates, by Prior Drug Coverage: 2004



SOURCE: Shea, D.G., Pennsylvania State University, Stuart, B.C., and Briesacher, B., University of Maryland School of Pharmacy, 2004.

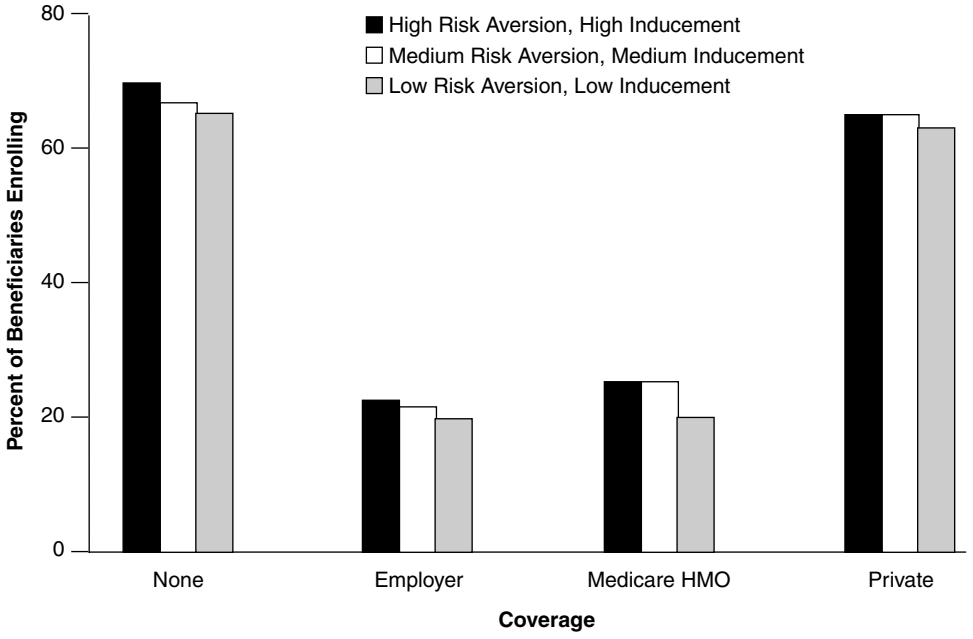
more than 60 percent of those with other private (often Medigap) coverage would join the Medicare drug plan. This level is nearly as high as the take-up rate for those with no prior coverage and reflects the more generous coverage in the Medicare plan and the associated risk-reduction benefits to these persons.

Figure 2 examines how changes in the assumptions about insurance inducement and risk aversion impact participation. The assumptions we make about risk aversion and insurance inducement have only a modest impact on participation. In the case when both risk aversion and insurance inducement are high (-0.0004 and -0.75, respectively) participation rates are less than 10 percentage points higher than in the case when both of these are low (-0.0002 and -0.25, respectively). Although changes in these factors shift the benefits individuals receive through third-party spending and risk reduction, they have little impact at the margin. Plan features, such as the donut hole limit the impact of insurance inducement on plan participation, because once an individual reaches that level of spending, no additional third-party payments are forthcoming until they reach the out-of-pocket maximum. Similarly, the generous coverage provided in employer plans, where the plurality of beneficiaries receives coverage, means that even a comprehensive Medicare drug plan offers little additional risk-reduction benefit to these beneficiaries.

Tables 3 and 4 show how participation is impacted by subsidy and benefit levels. Table 3 shows participation rates overall and by prior coverage under the assumption of a low benefit plan. This low benefit plan has a $250 deductible, 50 percent coinsurance, a $2,000 cap, and $6,000 stop loss. Table 4 shows participation rates for a

Figure 2

Effects of Inducement and Risk Aversion Assumptions On Participation in a Medicare Prescription Drug Plan: 2004



SOURCE: Shea, D.G., Pennsylvania State University, Stuart, B.C., and Briesacher, B., University of Maryland School of Pharmacy, 2004.

Table 3

Estimated Participation Rate in a Low Benefit Medicare Prescription Plan[1], by Source of Current Coverage Based on Alternative Premium Subsidies: 2004

	Beneficiary Income				
	</=135 Percent of FPL	>135 Percent of FPL			
		Premium Subsidy Percent			
Coverage	100	25	35	50	75
Total	56.7	18.5	20.4	24.2	41.7
Employer Sponsored	32.4	4.7	5.8	7.6	14.3
Medigap	100.0	49.6	53.0	59.2	73.1
Medicare HMO	49.6	5.9	7.0	9.9	17.8
Medicaid	19.1	9.3	10.4	11.9	14.6
Other Public	63.8	20.3	22.7	28.4	38.5
Mixed Plans	41.3	13.8	14.9	17.8	26.6
No Coverage	100.0	40.2	43.8	51.0	100.0

[1] This plan has a $250 deductible, 50-percent coinsurance, a $2,000 cap, and $6,000 stop loss.

SOURCE: Shea, D.G., Pennsylvania State University, Stuart, B.C., and Briesacher, B., University of Maryland School of Pharmacy, 2004.

moderate benefit package with no deductible, 50 percent coinsurance, a $2,500 cap, and $4,000 stop loss. Clearly, these features have more significant impacts on participation in our simulations than the behavioral assumptions previously modeled.

Participation rates among those with prior employer coverage are quite low until a sub-

Table 4

Estimated Participation Rate in a Moderate Benefit Medicare Prescription Plan[1], by Source of Current Coverage Based on Alternative Premium Subsidies: 2004

	Beneficiary Income				
	</=135 Percent of FPL	>135 Percent of FPL			
		Premium Subsidy Percent			
Coverage	100	25	35	50	75
Total	65.9	19.5	21.9	27	41.4
Employer Sponsored	52.6	6.4	7.5	9.9	21.6
Medigap	100	50.3	54.3	63.5	80.5
Medicare HMO	64.6	6.3	8	11.7	24
Medicaid	28.5	9.3	10.4	13	18.5
Other Public	74.3	22.2	24.7	32.2	51.2
Mixed Plans	58.8	15.6	16.9	22.3	36.9
No Coverage	100	39.9	45	53.6	72.7

[1] This plan has no deductible, 50 percent coinsurance, a $2,500 cap, and $4,000 stop loss.

SOURCE: Shea, D.G., Pennsylvania State University, Stuart, B.C., and Briesacher, B., University of Maryland School of Pharmacy, 2004.

stantial premium subsidy of 75 percent is provided. This suggests that crowd-out of employer plans might be minimized through subsidies scaled with income levels. Participation rates are approximately 10-percent higher among low-income beneficiaries and 1 to 3 percent higher among higher income beneficiaries under the more generous plan, with one exception. At a high subsidy level, our simulations indicate that a low benefit plan may achieve participation rates that are higher. Participation clearly depends on both the potential benefit paid out as well as the risk premium perceived by the individual and how those benefits compare to the actual premium costs. At a high subsidy level, the premium cost of the low benefit plan is actually reduced enough that persons with higher incomes, but no prior coverage have a risk premium that exceed the premium cost. Thus, they all participate under the simulation scenario which increases the total participation of the high income group. Otherwise, the more generous drug plan achieves higher participation with larger subsidies for high-income groups.

Participation rates also vary by beneficiary characteristics other than prior coverage. Beneficiary characteristics are related to prescription drug spending patterns. Beneficiaries that have low spending might prefer plans that have low deductibles. Others might prefer a high deductible, if greater coinsurance can be provided. Still others might be willing to accept greater first-dollar costs, if more catastrophic coverage can be provided through elimination of the donut hole or better stop-loss protection. Table 5 provides some idea of how various beneficiary characteristics are related to participation as benefits change. This table shows base case participation rates under one prescription drug plan, and then varies individual components of the plan to see their effect. Overall participation is closely related to sex, race, age, marital status, income, rural residence, and health status. With respect to age, participation rates show a U-shaped pattern, with higher levels among the disabled and the oldest-old. Participation rates peak among those with incomes just above the FPL.

Table 5

Simulated Beneficiary Enrollment, by Demographic Characteristics: 2004

Characteristic	Base Case[1]	Variation from Base Case: Deductible 0	Deductible $1,000	Coinsurance 20 Percent	Cap $3,000	Cap $1,000	Stop Loss $3,000	Stop Loss $6,000
				Percent				
Sex								
Male	38	43	30	65	40	37	40	36
Female	48	52	38	57	51	47	50	44
Race								
Black	42	48	34	62	44	41	44	40
Hispanic	43	49	35	61	46	42	45	39
White	44	49	35	60	45	41	46	41
Other	32	36	27	70	34	31	33	30
Age								
Under 45 Years	40	45	37	62	42	39	43	37
45-64 Years	43	47	36	60	45	42	46	39
65-69 Years	37	41	28	68	39	36	39	33
70-74 Years	41	46	32	64	43	40	42	38
75-79 Years	46	50	36	59	47	43	47	43
80 Years or Over	53	58	43	59	55	50	55	50
Marital Status								
Married	40	44	30	64	43	38	41	36
Unmarried	49	53	40	56	51	46	50	45
Income as a Ratio of FPL								
<100	56	63	48	61	58	54	59	53
100-120	62	68	53	68	64	61	67	60
120-135	63	70	53	69	65	61	68	61
135-150	41	45	30	62	44	39	43	39
150-175	38	42	29	66	39	36	39	35
175-200	39	44	30	65	42	35	39	36
>200	36	39	27	69	37	33	37	32
Metro								
Metro	4	45	31	52	41	36	42	37
Non-Metro	54	58	45	60	55	49	56	51
Health Status								
Excellent	36	40	28	43	37	31	37	32
Very Good	41	45	31	51	42	36	42	38
Good	45	50	35	56	46	41	47	42
Fair	49	54	40	60	50	45	51	46
Poor	49	52	42	59	50	45	52	45
Self-Reported Health Conditions								
Heart Disease	47	52	38	57	49	46	50	45
Cancer	45	50	36	59	47	44	46	42
Arthritis	45	50	36	59	47	43	47	42
Lung Disease	46	50	37	59	47	43	49	43
Psychiatric	42	47	35	58	43	41	44	38
Alzheimer's Disease	48	53	41	52	50	43	50	46
Diabetes	46	51	36	58	48	42	48	43
Hypertension	47	52	37	57	50	44	49	44
Osteoporosis	51	55	42	54	52	50	53	47
Stroke	50	54	40	54	52	48	52	46

[1] This plan has a $250 deductible, 50-percent coinsurance, a $2,000 cap, $4,000 stop loss, and a 75-percent subsidy.

SOURCE: Shea, D.G., Pennsylvania State University, Stuart, B.C., and Briesacher, B., University of Maryland School of Pharmacy, 2004.

Raising or lowering the deductible changes participation rates by about 5 to 10 percent for most demographic groups. Higher deductibles have a somewhat larger effect on those with low incomes than on other groups. Lower coinsurance boosts participation dramatically for several demographic groups. The stop loss and cap

Table 6

Population Crowd-Out in a Medicare Prescription Drug Plan: 2004

Measure	Moderate Benefit Plan			Low Benefit Plan		
	Subsidy (Percent)					
	25	50	75	25	50	75
	Percent					
Crowd-Out of Insured	18	21	25	15	17	20
Crowd-Out of Enrolled	39	39	38	37	37	32
Expansion of Uninsured	65	73	83	65	71	100
Expansion of Enrolled	45	44	41	50	49	52

SOURCE: Shea, D.G., Pennsylvania State University, Stuart, B.C., and Briesacher, B., University of Maryland School of Pharmacy, 2004.

generally have smaller effects on participation because they affect fewer beneficiaries than the other features of cost sharing.

The impact of participation in terms of crowd-out can be viewed in terms of enrollment or insurance status (Table 6). The table shows the ratio of those enrolling in a Medicare prescription drug plan that had prior coverage over the total number of persons who had prior coverage. This reveals what percentage of the insured population was crowded-out of an existing plan into the new Medicare plan. The table also shows the ratio of those who had a prior plan and enrolled over the total number of enrolled, or how many of the enrolled population in a new Medicare drug plan were previously covered under another plan. The table further shows the ratio of new enrollees in a Medicare plan that had no prior coverage over the total number of persons who had no prior coverage. In other words, this shows how effectively the plan reduces those with no drug coverage. Finally, it shows what percent of the total enrollment in a Medicare prescription drug plan were previously uninsured for drugs.

In general, these results suggest that crowd-out is relatively modest. Our simulations suggest that 20 to 25 percent of persons with prior coverage could drop that coverage and enroll in a Medicare prescription drug plan. They would represent approximately one-third to two-fifths of all new enrollees in the drug plan. Approximately two-thirds or more of the uninsured would choose to be covered, reducing those without coverage to just a few million beneficiaries. About one-half of the total enrolled population would be persons who previously had no coverage.

Another important part of crowd-out relates to how spending among payers other than Medicare will change. Our simulation assumes that those who have prior coverage that is more extensive than Medicare will be able to wrap this coverage around the Medicare coverage. For beneficiaries with multiple coverage, the simulation assumes a proportionate reallocation of spending among the multiple payers after accounting for Medicare payment.

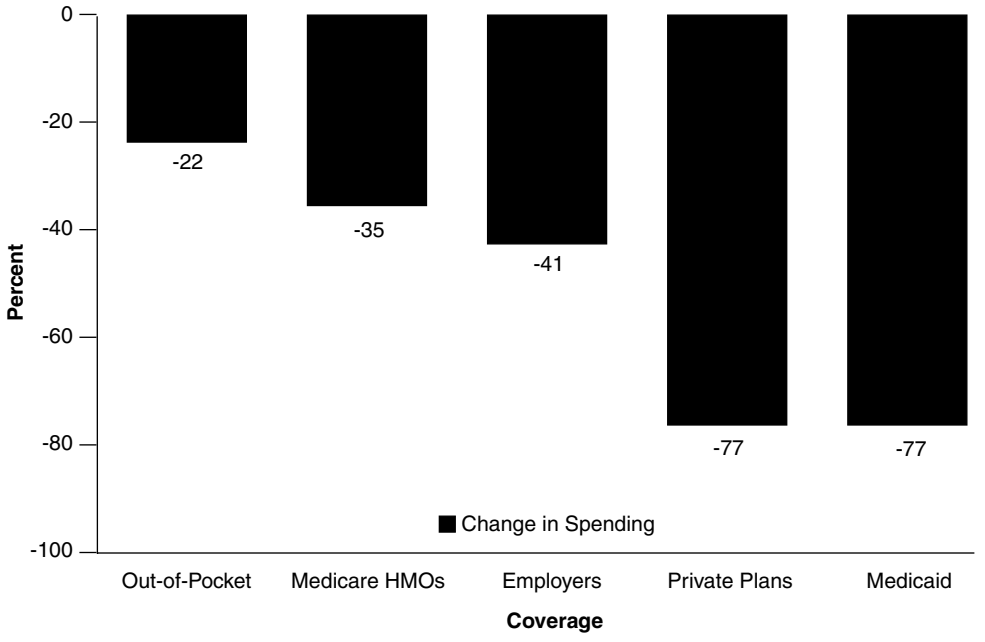
Figure 3 shows how much spending would be reduced for various payers under a Medicare prescription drug plan. Our simulation suggests that Medicaid and private (Medigap and other) plans would see the largest spending reductions. Employers and Medicare HMOs would see their spending reduced by about 40 percent. Despite the changes, private out-of-pocket spending is estimated to fall by only about 20 percent.

SUMMARY

This model simulation aids our understanding of potential participation and crowd-out in a Medicare prescription drug plan. We examine the impacts of plan features and subsidy levels as well as behavioral

Figure 3

Effect of Medicare Drug Benefit on Aggregate Spending, by Payers: 2004



SOURCE: Shea, D.G., Pennsylvania State University, Stuart, B.C., and Briesacher, B., University of Maryland School of Pharmacy, 2004.

parameters of inducement and risk aversion. Under the benefit designs modeled changes in behavioral parameters do not lead to major changes in enrollment. The benefits and subsidies have significant effects on overall participation and the distribution of participation among different groups. Simulated drug benefits with low deductibles and high coinsurance limit selection, but also limit participation by high-income groups. Lower coinsurance or higher subsidy levels raise enrollment to 40 percent or more in all groups.

Increasing participation among higher-income groups, however, may have consequences for both the performance and the perception of the plan. On the one hand, high levels of participation will limit the problem of risk selection. On the other hand, if many of the enrolled beneficiaries are those who drop prior coverage (one-third to two-fifths of the total in our simulations), the equity of the new Medicare spending might be questioned. With many younger families struggling to provide health insurance for themselves, questions about whether Medicare benefits are providing for those who could, in fact, provide for themselves, can certainly be an issue as the benefit is implemented. While crowd-out should not be the only measure of the impact of a drug plan, it can create negative perceptions of the public plan.

In terms of dollars, spending levels by Medicaid, private plans, and employers fall by 40 percent or more, while out-of-pocket spending (excluding premiums) falls by about 20 percent in the simulations. Again, how these changes will be viewed by the public may matter as much or more so than their true policy significance. The perception that the new Medicare drug plan may be bailing out employers or Medicare HMOs, rather than protecting beneficiaries is one that will be raised often between now and 2006.

To address these concerns, the final bill included provisions making Medicare the primary payer for beneficiaries dually eligible for Medicaid, coordinating Medicare coverage with State pharmaceutical assistance programs, and subsidizing retiree prescription drug coverage provided by employers. All of these reflect concerns policymakers had about crowding out existing sources of prescription drug coverage. While these provisions may help to limit crowd-out, they also have increased the complexity of implementing the legislation.

Simulations obviously have limitations in what they can and cannot reveal about policy and its effects. The actual plan benefits, subsidies, and other features that were passed and signed into law are inherently more complex than what can be easily simulated. Furthermore, assumptions we make in defining the parameters of the simulation certainly impact the results. Many of those assumptions can be rightly questioned. We try to provide an understanding of the impact of those assumptions by estimating multiple scenarios. Finally, our current simulations only estimate an initial impact of a new Medicare prescription drug plan. The new Medicare prescription drug coverage will have far-reaching, long-term impacts that are not captured by the simulation.

In conclusion, the development of a prescription drug plan for Medicare beneficiaries represents an important arena for learning more about the impact of incremental policy change on the Medicare population. These simulations can help us understand the potential pitfalls to the successful implementation of a Medicare drug benefit.

ACKNOWLEDGMENTS

The authors would like to thank Woolton Lee, Erica Gardner, and Chandra Ganesh for their help.

REFERENCES

Blumberg, L., Dubay, L., and Norton, S.: Did the Medicaid Expansions for Children Displace Private Insurance? An Analysis Using the SIPP. *Journal of Health Economics* 19(1):33-60, January 2000.

Cassidy, A., and Gold, M.: *Medicare+Choice in 2000: Will Enrollees Spend More and Receive Less?* The Commonwealth Fund. New York. August 2000.

Centers for Medicare & Medicaid Services: *Survey Overview.* August 23, 2002. Internet address: http://www.cms.gov/MCBS/Overview.asp. (Accessed 2004.)

Coulson, N.E., and Stuart, B.C: Persistence in the Use of Pharmaceuticals by the Elderly: Evidence from Annual Claims. *Journal of Health Economics* 11(3):315-328, October 1992.

Crippen, D.L.: *A CBO Analysis of the Administration's Prescription Drug Proposal*. Statement before the Subcommittee on Health, Committee on Ways and Means, U.S. House of Representatives. May 11, 2000. Internet address: http://www.cbo.gov/showdoc.cfm?index=1985&sequence=0&from=1. (Accessed 2004.)

Cutler, D., and Gruber J.: The Effect of Medicaid Expansions on Public Insurance, Private Insurance, and Redistribution. *American Economic Review* 86(2):378-383, May 1996a.

Cutler, D., and Gruber, J.: Does Public Insurance Crowd Out Private Insurance? *Quarterly Journal of Economics* 111(2):391-430, May 1996b.

Dubay, L., and Kenney, G.: Did Medicaid Expansions for Pregnant Women Crowd out Private Coverage? *Health Affairs* 16(1):185-193, January/February, 1997.

Dubay, L.: *Expansions in Public Health Insurance and Crowd-out: What the Evidence Says*. The Henry J. Kaiser Family Foundation. Washington, DC. October 1999. Internet address: http://www.kff.org/uninsured/loader.cfm?url=/commonspot/security/getfile.cfm&PageID=13305 (Accessed 2004.)

Fuchs B., James J., Mays J., and Schaefer M.: *Analyzing Options to Cover Prescription Drugs for Medicare Beneficiaries*. The Henry J. Kaiser Family Foundation. Washington, DC. July 2000. Internet address: http://www.kff.org/medicare/loader.cfm?url=/commonspot/security/getfile.cfm&PageID=13416 (Accessed 2004.)

Laschober, P., Kitchman, M., Meyer, L., and Langwell, K.: Medicare HMO Withdrawals: What Happens to Beneficiaries? *Health Affairs* 18(6):150-157, November/December 1999.

Moon, M.: Centers for Medicare & Medicaid Services, personal communication on Medicare Population Projections. Washington, DC. January 2003.

Poisal, J.: Centers for Medicare & Medicaid Services, personal communication on Preliminary Estimates from the MCBS. Baltimore, MD. August, 2001.

Pratt, J.: Risk Aversion in the Large and the Small. *Econometrica* 32(1-2):122-136, January-April, 1964.

Rask, K., and Rask, K. J.: Public Insurance Substituting for Private Insurance: New Evidence Regarding Public Hospitals, Uncompensated Care Funds, and Medicaid. *Journal of Health Economics* 19(1):1-31, January 2000.

Shore-Sheppard, L., Buchmueller, T., and Jensen G.: Medicaid and Crowding Out of Private Insurance: A Re-examination Using Firm Level Data. *Journal of Health Economics* 19(1):61-91, January 2000.

Stuart, B. C., Singhal, P. K., Fahlman, C., et al.: Employer-Sponsored Health Insurance And Prescription Drug Coverage For New Retirees: Dramatic Declines In Five Years, *Health Affairs Web Exclusive*, July 23, 2003. Internet address: http://content.healthaffairs.org/cgi/reprint/hlthaff.w3.334v1.pdf

Stuart, B. C. and Coulson, N. E.: Dynamic Aspects of Prescription Drug Use in an Elderly Population. *Health Services Research* 28(2):237-264, June 1993.

Stuart, B.C., Ahern, F., Rabatin, V., and Johnson, A.: Patterns of Outpatient Prescription Drug Use Among the Elderly: Evidence from the PACE Program. *Health Care Financing Review* 12(3):61-72, Spring 1991.

Stuart, B.C, Shea, D.G., and Briesacher, B.: Dynamics in Drug Coverage of Medicare Beneficiaries: Finders, Losers, Switchers. *Health Affairs* 20(2):86-99. March/April, 2001.

U.S. Department of Health and Human Services: *The 2000 HHS Poverty Guidelines*. Office of Assistant Secretary for Planning and Evaluation. Washington, DC. September 2002. Internet address: http://aspe.os.dhhs.gov/poverty/00poverty.htm (Accessed 2004.)

Reprint Requests: Dennis G. Shea, Ph.D., Pennsylvania State University, Department of Health Policy and Administration, University Park, PA 16802. E-mail: dgs4@psu.edu