

CBO

MEMORANDUM

BEHAVIORAL ASSUMPTIONS FOR
ESTIMATING THE EFFECTS
OF HEALTH CARE PROPOSALS

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This Congressional Budget Office (CBO) Memorandum describes some of the behavioral assumptions on which CBO relies in estimating the effects of health care proposals. It was prepared as one part of CBO's response to requests from the Subcommittee on Health of the House Committee on Ways and Means and the House Committee on Energy and Commerce for an examination of the distributional effects of current proposals to reform the health care system. Sandra Christensen of CBO's Health and Human Resources Division wrote the memorandum under the direction of Nancy Gordon and Linda Bilheimer. Questions about the analysis may be addressed to the author at (202) 226-2665.

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SUMMARY

To estimate the effects of proposals to change the health care system, the Congressional Budget Office (CBO) must make assumptions about the behavioral responses that might occur as a result of new policies. This memorandum draws on the best available research to develop a set of guidelines on which to base CBO's estimates. These guidelines will be revised as new and better evidence appears.

The Demand for Health Insurance

Summary Table 1 presents the behavioral estimates that CBO now relies on to assess the effects of changes in policy that would alter the effective price of insurance for consumers. Each estimate is presented as a point elasticity--that is, the percentage change in the amount of health insurance that would be purchased in response to a given percentage change in its price. The table shows elasticities for two kinds of choices related to the purchase of health insurance: the participation decision (whether to buy any insurance) and the quantity decision (how much to buy).

SUMMARY TABLE 1. ELASTICITY ESTIMATES FOR THE DEMAND FOR HEALTH INSURANCE

Decision	Elasticity	Determinant
Participation	-0.60 0.15	Effective price ^a Income relative to poverty threshold
Quantity	-0.63	Effective price ^a

SOURCE: Congressional Budget Office based on research literature.

NOTE: These are long-run elasticities. The first-year response would be one-third of the value shown. From 80 percent to 85 percent of the long-run result would be achieved by year 5; 97 percent would be achieved by year 10.

a. The effective price is the after-tax income that the consumer must give up to get insurance with an expected benefit of \$1.

The elasticities shown in Summary Table 1 may be interpreted as follows. Other things being equal, a 10 percent increase in the effective price of insurance would reduce the proportion of the population that purchased insurance by 6 percent. In other words, if the current effective price of insurance facing a group of people increased from, say, \$100 to \$110 a month, the proportion of the group that purchased insurance would fall by 6 percent (shown in the table as -0.60) from its current level. Similarly, a 10 percent increase in a family's income relative to the poverty threshold would increase its probability of purchasing insurance by 1.5 percent (shown as 0.15). Among those who purchased insurance, a 10 percent increase in the effective price per dollar of expected benefit would reduce the average value of the typical benefit package purchased by just over 6 percent (shown as -0.63).

The Effects of Cost Sharing

CBO's estimates of the effects of changes in cost-sharing requirements on the use of services by patients are based on results from the RAND Health Insurance Experiment (see Summary Table 2), although in many cases it is appropriate to modify those results to account for the responses of providers.

SUMMARY TABLE 2. ESTIMATES OF THE EFFECTS OF COST SHARING FOR ALL INSURED SERVICES

Plan Coinsurance Rate	Medical Expenses (1984 dollars)	Other Relative to Free Plan ^a	Free Relative to Other Plan ^a	Elasticities
Free	777	1.00	1.00	n.a.
25 Percent	630	0.81	1.23	n.a.
95 Percent	534	0.69	1.46	n.a.
0 to 25 Percent	n.a.	n.a.	n.a.	-0.10
25 to 95 Percent	n.a.	n.a.	n.a.	-0.14

SOURCE: Congressional Budget Office based on RAND Health Insurance Experiment results.

NOTE: n.a. = not applicable.

a. "Other" refers to either the 25 percent or the 95 percent plan.

For all insured services, the RAND results indicated that patients who faced a coinsurance requirement of 25 percent used 81 percent of the services they would use if care were free. That finding implies that eliminating the copayments typical of current insurance plans would increase the use of services by about 23 percent (or by $1/0.81$), assuming that there was sufficient excess capacity among health care providers to accommodate the increase in demand. Although not shown in the table, the effect of cost-sharing requirements on patients' use of services varies little by type of service, with the exception of inpatient care, for which the effects of cost sharing are less pronounced.

RAND analysts developed elasticity estimates from the plan effects they observed in the experiment for use in cases in which the applicable cost-sharing rates differ from those in the experimental plans. (The plan effects, when applicable, would be more reliable than the elasticities.) For all insured services, they report an elasticity of -0.10 to estimate the effects of proposals for changing cost-sharing requirements that range from zero to 25 percent. For cost-sharing requirements between 25 percent and 95 percent, they report an elasticity of -0.14.

The latter results from RAND are arc elasticities, whose interpretation is not as straightforward as that of the point elasticities described above. For an arc elasticity, the estimated percentage change in use of services is measured relative to the midpoint between initial and final levels of use, instead of relative to the initial level of use as it would be for a point elasticity. Similarly, the percentage change in cost sharing is measured relative to the midpoint between initial and final cost-sharing rates. Thus, a change in cost-sharing rates of between 15 percent and 25 percent would appear as a 50 percent increase (or $10/20$) instead of as a 67 percent increase ($10/15$). That cost-sharing change would induce a 5 percent reduction in use of services when measured relative to the midpoint between initial and final levels of use, but the percentage reduction would be somewhat smaller than 5 percent when measured relative to the initial level of use.

Use of Health Care by the Uninsured

CBO bases its estimates of how much those people currently without insurance would increase their use of health care services if they were insured on tabulations from the 1987 National Medical Expenditure Survey (see Summary Table 3). The data show that, on average, people who were uninsured throughout the year used about 59 percent of the services used by those who had private, employment-based insurance throughout the year. Part of that

SUMMARY TABLE 3.

HEALTH CARE COSTS FOR UNINSURED
PEOPLE UNDER AGE 65, 1987 (In percent)

	Overall	For Hospital Facility Services	For Physician and Other Professional Services
Using All Reported Charges			
Current Amounts for the Uninsured as a Percentage of Amounts for Privately Insured People Under Age 65			
Unadjusted for demographics	58.6	83.3	44.9
Adjusted for demographics	63.5	77.8	50.7
Estimated Percentage Increase for the Uninsured If Given Insurance Coverage	57.4	28.5	97.2
Using All Reported Payments			
Current Amounts for the Uninsured as a Percentage of Amounts for Privately Insured People Under Age 65			
Unadjusted for demographics	47.7	62.8	41.1
Adjusted for demographics	51.8	58.5	46.6
Estimated Percentage Increase for the Uninsured If Given Insurance Coverage	93.2	70.9	114.7

SOURCE: Congressional Budget Office estimates based on the 1987 National Medical Expenditure Survey.

NOTE: Insured = people under age 65 with employment- or union-based coverage all year and no public health benefits; uninsured = people under age 65 who reported no coverage all year but who may have received some public benefits. Charges exceed payments because of bad debt and charity care.

difference, however, reflects the different demographic characteristics of the two groups. After adjustments for differences in age, sex, health status, and income, the data indicate that average use by the uninsured population was about 64 percent of the average use of a group of insured people who were otherwise similar to the uninsured population. That result implies that use of health care services by the uninsured would increase by about 57 percent (based on the inverse of the adjusted-use ratio for uninsured over insured groups, or $1/0.64$) if they were covered by a typical insurance policy that included copayment requirements.

Health care payments for the uninsured would increase by larger amounts than their use of services--by about 93 percent--if the uninsured were covered, because about 20 percent of the costs of the services that the uninsured now receive are not directly compensated. However, much of the cost of uncompensated care is currently recovered by providers, either from other payers through higher rates (cost shifting) or from state and local subsidies. If eliminating uncompensated care for the uninsured led to reductions in the rates paid by insured groups and lower government subsidies, then covering the uninsured might increase national health expenditures only by the cost of the increase in their use of services and not by the larger increase in payments directly for them.

Provider Offsets

The effects previously discussed that result from changes in cost sharing and insurance coverage reflect only patients' responses, but in some instances it is necessary to take providers' responses into account as well. If the new policies were to have a significant effect on providers' revenues, providers might make offsetting changes in treatment or billing patterns for their patients.

Summary Table 4 shows the offset assumptions that CBO uses to estimate the effects of policy changes that would reduce providers' revenues. A 10 percent offset on Medicare's costs for hospital services, for example, means that if Medicare reduced its payment rates for hospital services by 5 percent, its costs would fall by only 4.5 percent under the current system. In other words, hospitals would offset 10 percent of the potential reduction in costs (or 0.5 percent) by changes in billing to bring in more revenues from Medicare; hospitals would probably increase their revenues from other payers as well. If all payers reduced their hospital payment rates by 5 percent, CBO assumes that hospitals would offset 15 percent of their potential drop in revenues. For physician services, CBO assumes that 50 percent of any potential drop in Medicare revenues and 55 percent of any drop in revenues from all payers would be offset.

For policy changes that would increase providers' revenues, no offset is now included in CBO's estimates. There is mounting evidence, however, that some offset may be appropriate in such circumstances, and CBO is currently reassessing its assumptions in this area.

SUMMARY TABLE 4. CBO'S ASSUMPTIONS ABOUT PROVIDER OFFSETS

	Hospitals	Physicians
Percentage of Potential Reduction in Medicare Revenues That Would Be Offset Through Increased Medicare Payments	10	50
Percentage of Potential Reduction in Total Revenues That Would Be Offset Through Increased Revenues from All Payers	15	55

SOURCE: Congressional Budget Office.

INTRODUCTION

Policies that would change the current methods of financing or delivering health care might also change the actions of consumers and providers. To estimate the effects of proposals for health care reform, the Congressional Budget Office (CBO) must make assumptions about the behavioral responses that might occur as a result of the new policies. This memorandum describes certain assumptions about those responses that CBO would use in its estimates and summarizes the evidence on which they are based. As more information becomes available, CBO will revise its assumptions as appropriate.

Three general kinds of behavior are examined here:

- o How consumers' demand for insurance changes in response to changes in its effective price to the buyer;
- o How consumers' demand for medical services changes in response to changes in their cost to the patient; and
- o The extent to which providers offset the effects on their revenues of price and copayment changes by changing their treatment or billing patterns.

Many behavioral assumptions take the form of an "elasticity," a number that indicates the percentage change to be expected in a given value in response to a specified percentage change in one of its determinants. For example, the demand for insurance is determined in part by its price. If the price of insurance increased by 10 percent--say, from \$100 to \$110 a month--and this caused a 6 percent reduction in participation--say, from 50 percent to 47 percent--the price elasticity of demand for insurance would be -0.6. Mathematically, this is expressed as

$$E = [(Q_1 - Q_0)/Q_0] / [(P_1 - P_0)/P_0].$$

The context for the discussion in this memorandum is a health care system that is operating without externally imposed constraints. The estimates developed here would be modified to take account of any constraints--such as capacity limitations or expenditure caps--if they were applicable.

DEMAND FOR HEALTH INSURANCE

Almost all current studies of the demand for health insurance focus on the influences operating on individuals, although most insurance is provided through employers. Employers' decisions about whether to offer insurance and the generosity of the plans they offer are assumed to result from employees' preferences, with the employer acting as the employees' agent in obtaining insurance. Two recent analyses examined employers' responses to the availability of subsidized insurance in pilot studies; they found negligible effects on the decision of whether to offer insurance, although that result may have been due to the way in which the subsidies were offered. (They were of short duration, available only to a group of employers that were least likely to offer insurance, and poorly advertised.¹)

In terms of individuals' responses, there are three issues of interest. One is how much an insurance plan's price and the income of a family affect that family's decision to participate in a health insurance plan. For insured people, a second issue is how the quantity of insurance benefits they purchase would change as the cost to the consumer was altered. A third issue is how the market shares of competing plans would be affected by changes in the relative prices of the plans. This memorandum examines studies dealing with each of these issues.²

Responses are likely to be smaller (less elastic) in the short term than they would be if consumers had more time to adjust their purchases to match their preferences, especially for those with employment-based group insurance. To exercise their choices to the fullest extent possible, given the collective nature of the decision, those with employment-based coverage must either change employers or negotiate with their current employers to change the menu of health insurance options available to them, a process that could take several years. Currently, only an estimated one-third of workers with

1. K. McLaughlin, "The Dilemma of Affordability: Private Health Insurance for Small Businesses," in R. Helms, ed., *American Health Policy: Critical Issues for Reform* (Washington, D.C.: American Enterprise Institute, 1992); K.E. Thorpe and others, "How Price Sensitive Are the Uninsured? Results from New York State's Health Insurance Pilot Programs" (working paper, University of North Carolina, 1991).

2. Some studies have addressed a fourth kind of insurance decision, but it is probably not relevant for estimating the effects of health proposals. That decision concerns the effects of the tax system in shifting individuals' preferences for compensation toward employer-paid health benefits, which are nontaxable. The larger elasticities that emerge from such studies are sometimes inappropriately assumed to apply to the demand for employment-based health insurance whether or not it is paid for by the employer, when actually they apply only to the share of benefits that the employer pays. For example, see J.E. Long and F.A. Scott, "The Income Tax and Nonwage Compensation," *Review of Economics and Statistics*, vol. 64, no. 1 (1982). Using $(1 - \text{tax rate})$ as the effective price of fringe benefits in a time series regression, the authors estimated a price elasticity of demand for employer-paid health benefits equal to -1.43, evaluated at an effective price of 78 cents per dollar of benefit. At an effective price of one dollar per dollar of benefit, that elasticity would be -1.84.

employment-based coverage have any choice among health insurance plans in any given year.³

Studies of the demand for health insurance assume that individuals' responses are based on the effective or out-of-pocket costs to them of insurance. The effective price P of insurance, per dollar of expected benefit, is defined as the after-tax income that the consumer must give up to get the insurance. Effective costs are calculated by multiplying P by the quantity of insurance benefits purchased.

If the consumer has employment-based health insurance, the effective price of that coverage--at the time that the compensation package is negotiated--is a function of the employer's share of the premium, the employee's marginal tax rate (assuming that the employer's share of premiums and payroll taxes is shifted to the employee through reduced wages), and the loading factor in the insurance plan.⁴ Hence,

$$P = [(1 - t)e + (1)(1 - e)] * (1 + L)$$

where

P = price per dollar of expected benefit;
 t = employee's marginal tax rate;
 e = employer's premium share; and
 L = insurance loading factor.

Here, the tax rate reflects both income and payroll taxes for federal and state governments. Although the employee's share of premiums must be paid from after-tax income, the employer's share is paid from pretax income. Under current law, the cost to the employee in forgone after-tax income of another

3. M.S. Marquis and S.H. Long, "Worker Demand for Health Insurance in the Non-Group Market," RAND Contract J-9-P-2-0017 (RAND, Santa Monica, Calif., June 1993).

4. Economic theory implies that market forces set a worker's total compensation, which includes not only wage or salary income but also the value of employer-paid fringe benefits. Hence, regardless of the shares of health insurance premiums or Social Security taxes that are nominally paid by the employer, the worker effectively pays all of those costs because employers tend to reduce wage and salary income by the amounts they pay for fringe benefits.

The loading factor is the amount by which insurance premiums exceed the value of insurance benefits, expressed as a percentage of benefits. It covers insurers' overhead costs (such as for marketing, underwriting, claims processing) and profits. This factor varies from about 5 percent for very large groups to about 40 percent for individual coverage. The Hay/Huggins Company provided those estimates, which are reported in House Energy and Commerce Committee, *Costs and Effects of Extending Health Insurance Coverage*, Committee Print, Serial 100-CC (October 1988), p. 46.

dollar of employer-paid insurance is only $(1 - t) * (1 + L)$, because wages would be taxed but the insurance would not be.

Rearranging the expression for P above, the employee's effective price of insurance is

$$P = (1 - et) * (1 + L). \quad [A]$$

This price is just $(1 + L)$ if either the employer's premium share or the employee's marginal tax rate is zero. In either case, the entire premium would be paid by the employee from after-tax dollars.

For employees facing a given menu of health insurance options under existing agreements about compensation, however, the effective price of each option for any given year is equal to the premium costs that the worker must pay out of pocket. In such cases, the employee's marginal tax rate is irrelevant to the short-run choice (over perhaps one to three years). But in the long run, workers' marginal tax rates would be relevant as their agents renegotiated the menu of options available to them in the compensation package or as they changed jobs.

The Participation Decision

Price elasticities for the insurance participation decision are hard to estimate because, typically, no information is available about the prices faced by those who have no insurance. A study by Marquis and Long attempted to overcome this problem by imputing premiums for a standardized nongroup insurance policy to a sample of families without employment-based coverage.⁵ The imputed premiums varied by the age and sex of the family head, by family type, and by location. (The study used separate Metropolitan Statistical Areas [MSAs] and non-MSA areas combined within a state.)

The Marquis and Long analysis assumed that policyholders would pay the full premium out of pocket if they bought insurance, although, because of the tax subsidy, that assumption would overstate the effective cost for those with access to employment-based coverage. As a result, the estimated price elasticities from a sample that included people with access to employment-

5. Marquis and Long, "Worker Demand for Health Insurance in the Non-Group Market." The study presents results from both a Current Population Survey (CPS) and a Survey of Income and Program Participation data base; however, only the CPS results are discussed here because they allow researchers to exclude people with access to employment-based coverage.

TABLE 1. ELASTICITY ESTIMATES FOR PARTICIPATION IN HEALTH INSURANCE

Study	Elasticities Using Only Families With No Access to Group Insurance	
	Price	Income
Marquis and Long ^a		
Income below 200 percent of poverty	-0.64	n.a.
Income above 200 percent of poverty	-0.54	n.a.
All Income Levels	-0.60	0.15

SOURCE: Congressional Budget Office.

NOTES: Price estimates are based on imputed premiums for a sample of workers from the Current Population Surveys for March and May 1988. The May survey identifies workers who do and do not have access to employment-based group insurance.

n.a. = not available.

- a. M.S. Marquis and S.H. Long, "Worker Demand for Health Insurance in the Non-Group Market," RAND Contract No. J-9-P-2-0017 (RAND, Santa Monica, Calif., June 1993). See also W. Manning and M.S. Marquis, "Health Insurance: The Trade-Off Between Risk Pooling and Moral Hazard," RAND Study R-N\3729-NCHSR (RAND, Santa Monica, Calif., December 1989). Using hypothetical responses and alternative models, the authors produced estimates of the participation elasticity that ranged between -0.43 and -1.0.

based coverage would be biased toward zero unless the employer's share was always zero.⁶

Using only those families with no access to employment-based coverage, Marquis and Long estimated price elasticities for participation of -0.64 for low-income families (with incomes below 200 percent of the poverty line) and -0.54 for higher-income families (see Table 1). For all families, the weighted average of those estimates is -0.60. Thus, the estimates imply that a 10 percent increase in the costs of insurance would reduce the probability of participation by 6 percent. Because the key explanatory variable is imputed, though, these estimates may understate the true response to price.

6. Econometric theory indicates that when an explanatory variable is measured with error, regression estimates of its coefficient are biased toward zero.

The Marquis-Long study also presents an income elasticity for the participation decision. For that estimate, each family's income was measured as a percentage of the poverty threshold for a family of the same size. The estimate indicates that a 10 percent increase in family income relative to the poverty threshold would increase the probability of purchasing insurance by 1.5 percent.

The Quantity Decision

Table 2 presents the results of five studies showing price elasticities for the quantity decision--the change in the expected value of benefits bought (among those people with some insurance) in response to a change in the effective price per dollar of insurance benefit.⁷ The results of all five studies are questionable. Findings from the first study are dubious because they depend on individuals' responses about what insurance supplement they would purchase under hypothetical price offers--rather than on those individuals' actual responses. Results from the other four studies are suspect because the respondents may still have been adjusting to meet their insurance preferences and because the studies inaccurately measured the effective costs of insurance facing respondents.

The study by Marquis and Phelps used data based on dichotomous buy/don't buy responses from participants in RAND's Health Insurance Experiment. Participants were responding to hypothetical offers of supplementary insurance that would pay some or all of the copayments for which the participants were liable under their experimental plans.⁸ On average, over all levels of supplementation, the study implies a price elasticity

7. For a review of the empirical studies in this area, see Chapter 5 of M.A. Morrisey, *Price Sensitivity in Health Care: Implications for Health Care Policy* (Washington, D.C.: National Federation of Independent Businesses, 1992). The results reported there are hard to interpret appropriately, however, because of definitional problems--differences among authors in how they define the elasticity for the quantity decision. Once results are presented in a consistent way--relative to the consumer's effective price, as in the examples in this memorandum--the range of elasticity estimates is from -0.16 to -0.82. Some authors define the elasticity with respect to total price, which increases the reported elasticity when the total price exceeds the effective price (as it does for employer-paid coverage). Others define an elasticity with respect to the consumer's marginal tax rate (a component of the effective price for those with employer-paid coverage), which changes the sign of the elasticity and reduces its absolute value.

8. M.S. Marquis and C.E. Phelps, "Price Elasticity and Adverse Selection in the Demand for Supplementary Health Insurance," *Economic Inquiry*, vol. 25, no. 2 (April 1987).

TABLE 2. PRICE ELASTICITY ESTIMATES FOR QUANTITY OF HEALTH INSURANCE PURCHASED

Study	Study Results		Elasticity at Effective Price of \$1
	Elasticity As Reported	Effective Price Assumed (Dollars)	
Estimates Based on Out-of-Pocket Premium Costs			
Marquis and Phelps, ^a Based on Responses for:			
Full supplementation only	-0.60	0.73	-0.82
Any supplementation	n.a.	n.a.	-0.63
Estimates Based on Individuals' Marginal Tax Rates			
Holmer ^b	-0.16	1.00	-0.16
Taylor and Wilensky ^c	-0.21	1.00	-0.21
Farley and Monheit ^d	-0.22	0.76	-0.29
Farley and Wilensky ^e	n.a.	0.77	-0.41

SOURCE: Congressional Budget Office.

NOTE: n.a. = not available.

- a. M.S. Marquis and C.E. Phelps, "Price Elasticity and Adverse Selection in the Demand for Supplementary Health Insurance," *Economic Inquiry*, vol. 25, no. 2 (April 1987). Estimates are derived from responses to hypothetical offers. The average elasticity across offers of any supplementation was estimated by Holmer (see below).
- b. M. Holmer, "Tax Policy and the Demand for Health Insurance," *Journal of Health Economics*, vol. 3 (1984).
- c. A.K. Taylor and G.R. Wilensky, "The Effect of Tax Policies on Expenditures for Private Health Insurance," in J. Meyer, ed., *Market Reforms in Health Care* (Washington, D.C.: American Enterprise Institute, 1985). The authors' measure of the effective price ignores the employer's share.
- d. P.J. Farley and A.C. Monheit, "Selectivity in Demand for Health Insurance and Health Care," in R. Scheffler and L. Rossiter, eds., *Advances in Health Economics and Health Services Research*, vol. 6 (Greenwich, Conn.: JAI Press, 1985).
- e. P.J. Farley and G.R. Wilensky, "Household Wealth and Health Insurance as Protection Against Medical Risks," in M. David and T. Smeeding, eds., *Horizontal Equity, Uncertainty, and Economic Well-Being* (Chicago: University of Chicago Press, 1985). The authors reported an elasticity with respect to the subsidy (*et*, in CBO's notation) of 0.09.

of demand of -0.63 when evaluated at an effective price of one dollar per dollar of insurance benefit.⁹

The elasticity estimate from the Marquis-Phelps study is probably indicative of a long-run response because hypothetical responses are not impeded by the process of adjustment. Evidence from another source indicates that the long-run response to changes in the effective price of insurance takes about 10 years to achieve--with about a third of the eventual response taking place in the first year.¹⁰ Given those results, the first-year elasticity implied by the Marquis-Phelps study would be about -0.21.

Elasticity estimates from the other four studies probably represent incomplete long-run responses to the price of insurance. Each of the studies defined an effective price of insurance using the employee's marginal tax rate and (except for Taylor-Wilensky) the employer's premium share. That specification implicitly assumes that individuals act as though they face a trade-off between higher wages and a larger share of insurance costs paid by the employer. For most employees, that assumption would be valid only in the long run, given sufficient time either to change the menu of plans offered by their current employers or to change employers.

Because it is unlikely that the insured employees who were included in these studies were all in equilibrium with respect to their insurance preferences, the measured responses to the price of insurance are probably understated. A second reason they may be understated is that each of the studies measured the long-run effective price of insurance with error, because (among other things) none had a measure of the applicable loading factor. Viewed in that light, the range of estimates presented in Table 2--from -0.16 to -0.41--is consistent with the Marquis-Phelps long-run elasticity of -0.63 and with a first-year elasticity of -0.21.

9. As calculated by M. Holmer in "Tax Policy and the Demand for Health Insurance," *Journal of Health Economics*, vol. 3 (1984). This is only coincidentally similar to the -0.60 elasticity reported in the Marquis-Phelps article, which was calculated only for offers of full supplementation and evaluated at an effective price of 73 cents per dollar of benefit.

10. W.P. Welch, "The Elasticity of Demand for Health Maintenance Organizations," *Journal of Human Resources*, vol. 21, no. 1 (1986). This study indicates that about a third of the difference between the then-current quantity and the predicted long-run quantity is eliminated each year. CBO's simulations indicate that this asymptotic process typically achieves at least 97 percent of the long-run quantity by the 10th year. From 80 percent to 85 percent of the long-run quantity is achieved by the 5th year.

Choosing Among Competing Plans

Table 3 presents the results of three studies estimating price elasticities for the choice among competing plans. All of those estimates control for the principal benefits provided by the different plans. Consequently, the results may be interpreted as responses to price changes among competing plans with similar benefits.

A study by Welch examined how the mix of competing health maintenance organizations (HMOs) and fee-for-service (FFS) plans would change for insured groups in response to changes in enrollees' out-of-pocket premium costs, controlling for all plan benefits apart from the form of organization.¹¹ The estimated long-run elasticity is -0.62 when assessing the change in the proportion of the insured population enrolled in HMOs instead of FFS plans that would occur in response to a change in the HMO premium. In other words, a 10 percent increase in the HMO premium (with the FFS premium unchanged) would reduce the HMO's market share by 6.2 percent. This same study estimates a long-run cross-price elasticity of 0.49 for assessing the change in an HMO's market share in response to a change in the premium for competing fee-for-service plans. A 10 percent increase in the FFS premium (with the HMO premium unchanged) would increase the HMO's market share by 4.9 percent.

Estimates from the study by Short and Taylor imply similar effects for the shift between competing HMO and FFS plans, although the study's results are based on premium differences instead of premium levels.¹² The estimated elasticity is 0.07 for assessing the change in an HMO's market share in response to a change in the difference between enrollees' out-of-pocket costs for FFS and HMO premiums. Thus, an increase of 10 percent in the difference (either because FFS premiums rise or HMO premiums drop) would increase the HMO's market share by 0.7 percent.

The Short-Taylor study also indicates that a given change in the premium difference between high-cost and low-cost FFS plans would affect the high-cost plan's market share. An increase of 10 percent in the premium difference would reduce the high-cost plan's market share by 1.4 percent, using an elasticity of -0.14. That elasticity is twice as large as the change in an HMO's market share in response to a similar change in the premium difference between the HMO and FFS plans.

11. Welch, "The Elasticity of Demand for Health Maintenance Organizations." Plan benefits are described in terms of the covered services and copayment requirements.

12. P.F. Short and A.K. Taylor, "Premiums, Benefits, and Employee Choice of Health Insurance Options," *Journal of Health Economics*, vol. 8 (1989).

TABLE 3. PRICE ELASTICITY ESTIMATES FOR CHOOSING AMONG PLANS WITH SIMILAR BENEFITS

Study	Change in Market Share in Response to Change in		
	HMO Plan Premium	FFS Plan Premium	Premium Difference
Welch (For HMO share of total)^a			
Short run (First year)	-0.20	0.16	n.a.
Long run (Ten years)	-0.62	0.49	n.a.
Short and Taylor^b			
For high-cost plan's share of FFS market	n.a.	n.a.	-0.14
For HMO plan's share of total market	n.a.	n.a.	0.07
Feldman and Others^c			
For same-type switch	n.a.	-0.16 to -0.52	n.a.
For HMO/FFS switch	-0.03 to -0.16	n.a.	n.a.

SOURCE: Congressional Budget Office.

NOTES: All estimates are based on out-of-pocket premium costs.

HMO = health maintenance organization; FFS = fee for service; n.a. = not applicable.

- a. W.P. Welch, "The Elasticity of Demand for Health Maintenance Organizations," *Journal of Human Resources*, vol. 21, no. 1 (1986).
- b. P.F. Short and A.K. Taylor, "Premiums, Benefits, and Employee Choice of Health Insurance Options," *Journal of Health Economics*, vol. 8 (1989). For the FFS comparison, the premium difference is the high-cost premium minus the low-cost premium. For the HMO/FFS comparison, the premium difference is the FFS premium minus the HMO premium.
- c. R. Feldman and others, "The Demand for Employment-Based Health Insurance Plans," *Journal of Human Resources*, vol. 24, no. 1 (1989), Tables 3 and 4. (The range shown uses estimates for $P_{ij} = 0.5$, in the authors' notation.)

To see the similarity in the implications of the Short-Taylor study and the Welch study for how an HMO's market share is affected, let us take an example in which enrollees' effective premium costs were originally \$85 for an HMO plan and \$100 for an FFS plan with comparable benefits. Consider the effects of a \$10 reduction in the effective FFS premium.¹³ Using the Welch cross-price elasticity of 0.49, the HMO's market share would drop by 4.9 percent ($-0.1 * 0.49$, where the percentage change in the FFS premium is $-10/100$). Using the Short-Taylor elasticity of 0.07, the HMO's market share would drop by 4.7 percent ($-0.67 * 0.07$, where the percentage change in the premium difference is $[5 - 15]/15$).

The results of a third study, by Feldman and others, suggest similar implications (see Table 3). The methods used in that study do not permit calculation of a single elasticity, either for shifts among FFS plans or for shifts between FFS and HMO plans. The results for elasticities that vary by each plan's current market share do, however, confirm the finding in the Short-Taylor study that enrollees' responsiveness to premiums is larger for shifts among FFS plans than for shifts between FFS and HMO plans.

Examples Using Estimated Insurance Elasticities

Although the insurance elasticities discussed above are point elasticities, they are sometimes used as arc elasticities so that options with a current price of zero can be examined.¹⁴ An arc elasticity differs from a point elasticity only in that the percentage changes that define the elasticity are measured from the midpoint of the initial and final prices (for the denominator) or quantities (for the numerator). Using an arc elasticity, the new quantity demanded is

$$Q_1 = Q_0 [1 + E(P_1 - P_0)/(P_1 + P_0)] / [1 - E(P_1 - P_0)/(P_1 + P_0)] \quad [B]$$

where

- Q = quantity;
- P = price;
- E = elasticity (with appropriate sign attached);
- 0 = initial point; and
- 1 = new point.

13. The implications of the two studies are less similar when the HMO premium, rather than the FFS premium, is assumed to change.

14. As a point elasticity, the new quantity demanded in response to a price change would be $Q_1 = Q_0 [1 + E(P_1 - P_0)/P_0]$.

The examples discussed here use a participation elasticity of -0.60 from the Marquis-Long study--the only one that reports a participation estimate. The quantity elasticity used is -0.63, based on the Marquis-Phelps study--the one least subject to estimation bias. For choice among competing plans, the examples use the Short-Taylor estimates because results based on the difference in premiums are easier to interpret. Hence, estimates of the market share of the more expensive of two competing FFS plans are based on an elasticity of -0.14. Estimates of the market share of an HMO plan competing with an FFS plan are based on an elasticity of 0.07.

Those elasticities may not be appropriate, however, for estimating the effects of policy changes that would significantly restructure the health insurance market. In such circumstances, CBO may base its assumptions on other evidence. For example, the elasticities for the choice among competing plans generally imply little movement from FFS to HMO plans in response to a sizable decrease in the price of HMO plans relative to FFS plans. But in areas in which a version of managed competition has been tried (such as the systems set up for state employees in California and Wisconsin), the proportion of employees choosing an HMO is large--both in absolute terms (more than 70 percent) and relative to the norm for the rest of the state's population. Based on that evidence, CBO's estimates for one managed competition proposal--under which substantial restructuring would occur--assumed that 75 percent of the nonpoor urban population would be in HMOs at the end of five years.¹⁵

The remainder of this section illustrates how the price elasticities for the demand for health insurance discussed earlier might be used to assess certain changes in policy.¹⁶

Example 1: Channel all individual insurance through a purchasing pool, reducing the insurance loading factor. If the average loading factor was reduced for people with no access to public or private group insurance by allowing individuals to purchase insurance through regional cooperatives, the effective price per dollar of benefit would drop--from about 1.4 to 1.1 per dollar of benefit in this example. That reduction might induce some people who are now without insurance to buy it--leading to an increase of nearly 16 percent in the proportion of individuals in the group who would have coverage:

$$\text{New } Q = Q_0 * 1.155$$

15. See Congressional Budget Office, "Estimates of Health Care Proposals from the 102nd Congress," CBO Paper (July 1993).

16. In principle, elasticities should be reevaluated for each proposal, depending on the current effective price and quantity of insurance involved and the demographic characteristics of the groups that would be affected. In practice, however, such detailed information is seldom available.

from equation [B] on page 11 where

$$\begin{aligned} E &= -0.60; \\ P_0 &= 1.4 \text{ (40 percent loading factor);} \\ P_1 &= 1.1 \text{ (10 percent loading factor); and} \\ Q &= \text{the proportion of the group with coverage.} \end{aligned}$$

In addition to an increase in the proportion of people who would purchase coverage, the average value of the policies purchased would increase in response to the lower premium costs--by more than 16 percent in the long run:

$$\text{New } Q = Q_0 * 1.164$$

from equation [B] on page 11 where

$$\begin{aligned} E &= -0.63; \\ P_0 &= 1.4 \text{ (40 percent loading factor);} \\ P_1 &= 1.1 \text{ (10 percent loading factor); and} \\ Q &= \text{the value of the average benefit package.} \end{aligned}$$

The estimated effects in this example would be different if different loading factors were appropriate for the affected groups. (The differences would alter the initial effective price P_0 .)

Example 2: Limit the tax subsidy for employer-paid insurance plans with expected benefits in excess of a specified dollar amount. One way to carry out this change would be to add amounts above the limit to employees' taxable incomes. In that case, employers would be unlikely to make any immediate change in the plans they offered. But the effective price of employment-based insurance would increase for employees who currently had plans more generous than the limit, because that portion above the limit (assumed to be 30 percent in this example) would no longer be subsidized through the tax system. As a result, some employees would choose less generous plans, provided that the employer currently offered a choice. If the employer did not, some employee groups would negotiate a less generous plan with their employers at the next opportunity in the bargaining cycle. In the long run (from 5 to 10 years), the average value of benefits would fall to about 94 percent of their initial value:

$$\text{New } Q = Q_0 * 0.935$$

from equation [B] on page 11 where

$$\begin{aligned}
E &= -0.63; \\
P_0 &= 0.76; \\
P_1 &= 0.85; \text{ and} \\
Q &= \text{the expected value of plan benefits.}
\end{aligned}$$

Here, P_0 is calculated from equation [A] on page 4, assuming

$$\begin{aligned}
&\text{Insurance loading factor } L = 0.05; \\
&\text{Employers' average premium share } e = 0.85; \text{ and} \\
&\text{Employees' marginal tax rate } t = 0.32.
\end{aligned}$$

For this example, the new effective price P_1 of the employer's original plan would be 0.85, or $[1 - (0.595)(0.32)](1.05)$ from equation [A] on page 4. Because 70 percent of the value of the original plan is below the limit (as assumed for this example), the portion of the plan premium that would be subsidized through the tax system would drop from 85 percent to 59.5 percent (or $[0.7][0.85]$).

The same result would occur in the long run if, instead, the tax subsidy was eliminated by prohibiting employers from deducting from their taxable income the expenses of plans that were more generous than the limit. Under the assumption that 30 percent of the original plan's benefits were above the limit,

$$\text{New } X = X_0 * 0.8$$

from equation [B] on page 11 where

$$\begin{aligned}
E &= -0.63; \\
P_0 &= 0.76; \\
P_1 \text{ of } X &= 1.05;^{17} \text{ and} \\
X &= \text{benefits above the limit } (X_0 = 0.3 * Q_0).
\end{aligned}$$

In terms of total benefits,

$$\text{New } Q = (0.7 * Q_0) + (0.3 * Q_0 * 0.8) = Q_0 * 0.935.$$

In the short run, however, these two approaches to eliminating the tax subsidy would have different results--with employees' total plan benefits being smaller (although their take-home pay might be greater) under the second

17. The value used for P_1 of X assumes that the supplement could be purchased as employment-based group insurance, even though the costs would not be shared by the employer.

approach. Under the first approach, employees would not see any immediate change in their health plans, which would only gradually be scaled back in response to their new preferences. By contrast, under the second approach, employers would quickly scale back any plans they offered that had expected benefits greater than the limit, and employees would only gradually recover a portion (about 80 percent under the assumptions here) of current benefits above the limit by purchasing supplements to the less generous plans their employers would now be offering.

DEMAND FOR MEDICAL CARE

Two aspects of the response of individuals to changes in what they must pay out of pocket for health care are of interest. One is, how much would spending for covered services change when cost-sharing requirements changed for an insured population? Another is, how much would spending for covered services change when an uninsured population became covered?

Changes in Response to Cost Sharing

To estimate how much the use of services would change among insured people faced with a change in copayment requirements (assuming a cap on copayment costs), the most credible and comprehensive estimates come from the RAND Health Insurance Experiment, which ran from 1974 through 1981.¹⁸ The primary results shown here are for discrete "plan effects," comparing the use of acute care services under three plans: free care, 25 percent coinsurance, and 95 percent coinsurance.¹⁹ In each plan with coinsurance, copayment costs were capped at \$1,000 or less, depending on family income.²⁰

For all income and age groups combined, covered medical expenditures were 23 percent higher when care was free, compared with expenditures for

18. W. Manning and others, "Health Insurance and the Demand for Medical Care: Evidence from a Randomized Experiment," *American Economic Review*, vol. 77, no. 3 (1987).

19. RAND's results for the 50 percent coinsurance plan are not shown here. Some of the findings for that plan were not credible because of sampling problems.

20. This same cap was applied over an eight-year period, terminating in the early 1980s. Inflating the \$1,000 cap from 1978, the midpoint year, the 1992 equivalent value would be \$2,000 if it just kept pace with growth in median household income. If, however, the 1992 equivalent value kept pace with growth in per capita personal health care costs, it would be nearly \$4,000.

care subject to 25 percent coinsurance (see Table 4).²¹ Free care resulted in expenditures that were 46 percent higher than they would have been if patients had paid virtually all of their expenses out of pocket (the 95 percent coinsurance plan) up to the cap.²²

RAND analysts used the plan effects to derive elasticities for estimating the effects of smaller coinsurance differences than those among the alternative plans in the experiment. Researchers estimated arc elasticities in two different circumstances. In one case, the elasticities would apply when the change in the effective coinsurance rate was known for a given episode of care. In the second (and more likely) case, the elasticities would apply when a number of different coinsurance rates were effective for specific episodes of care and only the change in the average coinsurance rate over a given period was known.

According to the authors, the average elasticity is biased but may nevertheless yield a more accurate estimate of effects when only an average--rather than the effective--coinsurance rate is known. In fact, the average elasticity appears to give better results (that is, closer to those implied by the plan effects) even in cases in which the effective coinsurance rate is known.²³

Estimates based on the plan effects shown in Table 4 will be most accurate when similar discrete changes in cost sharing are proposed. For other changes in cost sharing, however, it is necessary to base estimates on the arc elasticities developed by RAND. For proposals with both initial and final coinsurance rates of 25 percent or less, the estimated arc elasticity is -0.10; for proposals with initial and final coinsurance requirements above 25 percent, the estimated arc elasticity is -0.14. For proposals whose initial and final coinsurance rates span both ranges, an approach consistent with the arc

21. Covered services included all acute medical services whether inpatient or outpatient, prescription drugs, dental care, mental health services, and medical equipment. Similar results were obtained from a natural experiment in the late 1960s; see A. Scitovsky and N. Snyder, "Effect of Coinsurance on Use of Physician Services," *Social Security Bulletin*, vol. 35, no. 6 (1972); and A. Scitovsky and N. McCall, "Coinsurance and the Demand for Physician Services: Four Years Later," *Social Security Bulletin*, vol. 40, no. 5 (1977). These studies compared spending for inpatient and outpatient physician services under a free plan and a plan with 25 percent coinsurance. They found that spending was 31 percent higher under the free plan.

22. The results shown for all insured services differ from those shown separately by type of service in that the plan comparisons for all insured services are based on predicted mean (average) spending instead of actual mean spending by the sample respondents. Results based on unadjusted means are quite sensitive to the presence of catastrophic cases, and the predicted means provide what RAND analysts believe are more robust estimates. Unfortunately, results based on predicted means are available only for the all-insured-services category. Actual means for the all-insured-services category, as reported by RAND analysts, are \$749 (free), \$634 (25 percent), and \$518 (95 percent).

23. RAND's plan effects are more reliable than the elasticities derived from them because the plan effects were directly observed. By contrast, the elasticities had to be estimated from the plan effects, and there is no universally accepted way by which to derive those estimates.

TABLE 4. EFFECTS OF COST SHARING FROM THE RAND HEALTH INSURANCE EXPERIMENT, BY TYPE OF PLAN

Plan Coinsurance Rate	1984 Medical Expenses (Dollars)	Other Relative to Free Plan ^a	Free Relative to Other Plan ^a	Other Relative to 95 Percent Plan ^a
All Insured Services^b				
Free	777	1.00	1.00	1.46
25 Percent	630	0.81	1.23	1.18
95 Percent	534	0.69	1.46	1.00
Insured Outpatient Services^b				
Free	340	1.00	1.00	1.67
25 Percent	260	0.76	1.31	1.28
95 Percent	203	0.60	1.67	1.00
Insured Inpatient Services^b				
Free	409	1.00	1.00	1.30
25 Percent	373	0.91	1.10	1.18
95 Percent	315	0.77	1.30	1.00
Insured Prescription Drugs^c				
Free	60	1.00	1.00	1.76
25 Percent	46	0.76	1.32	1.34
95 Percent	34	0.57	1.76	1.00
Insured Dental Services^d				
Free	243	1.00	1.00	1.46
25 Percent	185	0.76	1.31	1.11
95 Percent	166	0.68	1.46	1.00
Insured Outpatient Mental Health Services^e				
Free	32	1.00	1.00	2.33
25 Percent	22	0.67	1.48	1.57
95 Percent	14	0.43	2.33	1.00

(Continued)

TABLE 4. CONTINUED

SOURCE: Congressional Budget Office based on results from the RAND Health Insurance Experiment.

NOTES: For changes in cost sharing not shown above, effects can be calculated using arc elasticities of -0.10 for cost sharing between 0 and 25 percent, and -0.14 for cost sharing between 25 percent and 95 percent, from Table 9 in W. Manning and others (see note b below).

Results shown for the all-insured-services category were the expected means calculated by the RAND authors from regression equations using actual means, thereby smoothing out the effects of extreme observations. All other results use actual means for the participants in each plan.

- a. "Other" refers to either the 25 percent or the 95 percent plan.
 - b. Based on W. Manning and others, "Health Insurance and the Demand for Medical Care," *American Economic Review*, vol. 77, no. 3 (1987); see Table 3 for all insured services and Table 2 for inpatient and outpatient services. For inpatient services, differences among plans with nonzero coinsurance were not significant.
 - c. Based on A. Leibowitz, W. Manning, and J. Newhouse, "The Demand for Prescription Drugs as a Function of Cost-Sharing," *Social Science and Medicine*, vol. 21, no. 10 (1985), Table 4.
 - d. Based on W. Manning and others, "The Demand for Dental Care: Evidence from a Randomized Trial in Health Insurance," *Journal of the American Dental Association*, vol. 110, no. 6 (1985), Table 4.
 - e. Based on W. Manning and others, "How Cost Sharing Affects the Use of Ambulatory Mental Health Services," *Journal of the American Medical Association*, vol. 256, no. 14 (1986), Table 2.
-

elasticity formulation would be to use the -0.14 elasticity if the midpoint between the initial and final coinsurance rates was more than 25 percent, and to use the -0.10 elasticity otherwise.

Although the RAND study presents distinct results for inpatient and outpatient care, it may be more accurate to use overall effects instead for proposals in which only the effects on total health spending are important. The reason is that the national health expenditure accounts, which are separate for "hospital" and "physician" services, do not correspond to RAND's classifications. "Inpatient" services in the RAND study include only part of hospital services and all inpatient physician services; "outpatient" services include costs for hospital clinic and emergency room facilities and exclude inpatient physician costs.

One interesting result from the RAND analysis is that inpatient use appears to rise and fall in tandem with the use of ambulatory physician services and is altered at least as much by changes in copayment requirements for ambulatory care as by changes in copayments for inpatient services. In the RAND experiment, inpatient spending was about 10 percent lower in plans with copayments compared with free care, whether or not copayments were imposed on all services or only on outpatient care. For example, inpatient spending under a plan that imposed 25 percent coinsurance on all services was the same as it was under a plan that imposed a \$150 deductible only on ambulatory care and had no copayment requirements for inpatient services.

Prescription Drugs. Prescription drugs were included in the set of insured benefits offered under the RAND study, and the effect of copayments on the use of prescription drugs was similar to their effect on the use of outpatient medical services.²⁴ When prescription drugs were free, spending was 32 percent higher than it was under a plan with 25 percent coinsurance and 76 percent higher than under a plan with 95 percent coinsurance.

Prescription drug coverage in the RAND experiment did not vary independently of coverage for physician services; consequently, the effects of adding a prescription drug benefit to plans that already covered physician services could not be isolated. Because enrollees were no more likely to demand lower-priced generic products when they faced a high coinsurance rate than when no copayment was required, the authors believe that variation in spending for prescription drugs primarily reflected enrollees' use of physician services.

24. A. Leibowitz, W. Manning, and J. Newhouse, "The Demand for Prescription Drugs as a Function of Cost-Sharing," *Social Science and Medicine*, vol. 21, no. 10 (1985).

Based on the RAND results and other evidence examined in a 1989 CBO study, if prescription drugs were not covered, changes in spending for them would be expected to mirror enrollees' changes in spending for physician services.²⁵ Adding coverage for prescription drugs to a comprehensive plan that already covered physician services would further increase spending for drugs by about 7 percent.

Dental Services. The RAND results indicate that the steady-state effects of cost sharing on spending for dental services are similar to those for medical services overall.²⁶ When services were free, spending was 31 percent higher than it was under a plan with 25 percent coinsurance and 46 percent higher than under a plan with 95 percent coinsurance. Apparently as a result of a "catch-up" effect, however, the response to reduced cost sharing was nearly twice as large in the first year of coverage as the steady-state response.

Mental Health Services. The RAND results indicate that the effects of cost sharing on spending for outpatient mental health services are greater than the effects on spending for medical services overall, although the differences are not statistically significant.²⁷ When services were free, spending was 48 percent higher than it was under a plan with 25 percent coinsurance and 133 percent higher than under a plan with 95 percent coinsurance. The study found no evidence that more generous coverage for psychotherapy was associated with lower expenditures for other medical services.

Changes in Response to Covering the Uninsured

The RAND results set a floor on the likely increase in the use of services by previously uninsured people who are given typical coverage. If the 95 percent RAND plan is assumed to be equivalent to no coverage, despite the \$1,000 cap on overall out-of-pocket costs for enrollees, the RAND results imply that new coverage under a typical private policy would increase overall use of insured services by at least 18 percent. If the new coverage provided first-dollar protection, it would increase the use of services by at least 46 percent. However, estimated increases in the use of health care services by those currently without insurance exceed the floor set by the RAND results.

25. Congressional Budget Office, *Updated Estimates of Medicare's Catastrophic Drug Insurance Program* (October 1989), p. 50.

26. W. Manning and others, "The Demand for Dental Care: Evidence from a Randomized Trial in Health Insurance," *Journal of the American Dental Association*, vol. 110, no. 6 (1985), Table 4.

27. W. Manning and others, "How Cost Sharing Affects the Use of Ambulatory Mental Health Services," *Journal of the American Medical Association*, vol. 256, no. 34 (1986), Table 2.

CBO, using data from the 1987 National Medical Expenditure Survey (NMES), bases its estimates of the effect of insurance coverage on a comparison of use by otherwise similar demographic groups who differed only in whether they had insurance during the year. The uninsured group was made up of people under age 65 who reported themselves as uninsured throughout the year, even if some public-sector payments were made on their behalf during that time.²⁸ The insured group was composed of people younger than 65 who had employment-based or union coverage throughout the year and who received no health benefits from public programs.

A simple comparison of costs for those with and without insurance--with no adjustment for their different demographic characteristics--shows that overall health care costs for the uninsured are 59 percent of costs for the insured (see Table 5). To predict costs for the uninsured if they had insurance, the comparison must be adjusted for demographic differences.

CBO calculated what costs and payments for services used by the uninsured group would have been if those individuals had been insured by giving specific uninsured demographic groups the same average use as the corresponding insured group, summed over all groups. The demographic groups were defined by age, sex, health status, and income relative to the poverty threshold. Costs were measured as reported charges, reduced by insurer discounts where applicable; they included all services used, even if the providers were not compensated. Payments included only services for which patient-specific payments were made to the providers.

The adjusted results indicate that uninsured people cost about 64 percent of what they would cost (at current charges) if they had insurance. Hence, their use of services would increase by 57 percent if they received coverage under a typical employment-based plan (which includes copayment requirements), with no access to benefits under public programs.²⁹ The increase would be greater for physician than for hospital services.³⁰ These results, however, may overstate the increase in use to be expected among those

28. Public benefits for this group came through Medicaid programs for the medically needy, veterans' programs, and other federal and state programs for the medically indigent. It is through such programs, along with free care, that the uninsured receive health care services when a medical emergency strikes.

29. A recent study by B. Spillman ("The Impact of Being Uninsured on Utilization of Basic Health Care Services," *Inquiry*, vol. 29, no. 4, 1992), reports that spending for the uninsured would increase by 165 percent overall once they became insured, based on the 1980 National Medical Care Utilization and Expenditure Survey. That increase is probably overstated because of the way Spillman defined the uninsured population. By excluding those who received some public benefits under various programs, she excluded the only segment of the uninsured population that has significant health care expenses.

30. To use this estimated increase, one needs an estimate of the current costs of services used by the uninsured. For 1991, those costs were estimated at \$35 billion.

TABLE 5. HEALTH CARE COSTS FOR UNINSURED PEOPLE UNDER AGE 65 COMPARED WITH INSURED PEOPLE UNDER AGE 65, 1987 (In percent)

	<u>Using All Charges</u>		<u>Using All Payments</u>	
	Unadjusted	Adjusted ^a	Unadjusted	Adjusted ^a
Costs As a Percentage of Costs for the Insured				
Overall	58.6	63.5	47.7	51.8
For Hospital Facility Services	83.3	77.8	62.8	58.5
For Professional Services	44.9	50.7	41.1	46.6
Percentage Increase in Costs for the Uninsured If Insured				
Overall	n.a.	57.4	n.a.	93.2
For Hospital Facility Services	n.a.	28.5	n.a.	70.9
For Professional Services	n.a.	97.2	n.a.	114.7

SOURCE: Congressional Budget Office estimates based on the 1987 National Medical Expenditure Survey.

NOTES: Insured = people under age 65 with employment- or union-based coverage all year and no public health benefits; uninsured = people under age 65 who reported no coverage all year but who may have received some public benefits; n.a. = not applicable.

a. For age, sex, income, and health status.

currently without insurance. (Some have argued that people in this group would have a relatively low propensity to seek medical care even if they had insurance.)

According to the NMES, providers are not directly compensated for about 20 percent of the costs of services used by the uninsured. As a result, the increase in payments for services to the uninsured would be greater--about 93 percent--if they became insured. That outcome would not necessarily result in higher national health expenditures, however. Some or all of the uncompensated costs for the uninsured are either paid for by state and local subsidies or shifted to other payers through higher rates. Reducing or eliminating uncompensated costs for the uninsured could be accompanied by reducing both those subsidies and the rates charged other payers.

CBO's estimated increase in health care costs for the uninsured (57 percent) is lower than the estimate made by Lewin-VHI from the NMES data of a 74 percent increase in overall use for the newly insured.³¹ According to the Lewin-VHI results, physician services would increase by 117 percent, and hospital (inpatient and outpatient) services would increase by 65 percent. The Lewin-VHI estimates, however, include people with public benefits, such as Medicare and Medicaid, in the insured group. Because many Medicare enrollees (those who have supplementary coverage) and most Medicaid beneficiaries have no copayment costs, including those groups overstates the effects of employment-based insurance, which typically has copayment requirements. Furthermore, the comparisons between insured and uninsured groups are not clear-cut because sample respondents were classified based on their insurance status for only three quarters out of four.

Providers' Offsetting Responses

One important caveat must be kept in mind when using the RAND estimates of the effects of cost sharing on the use of services by insured people. They are appropriate without adjustment only under circumstances similar to those in place for the RAND experiment--in which the patients affected by the cost-sharing changes were only a small part of any given provider's patient load. Consequently, the patients' behavioral responses generated no offsetting behavioral response by providers.

There is evidence that providers generate offsetting changes in billing for their patients when a large part of their patient load is affected by new cost-

31. J. Sheils, L. Lewin, and R. Haught, "Potential Public Expenditures Under Managed Competition," *Health Affairs* (Supplement, 1993), Exhibit 1.

sharing requirements.³² The health reform proposals currently being discussed would affect a significant portion of the patient load of most providers. Hence, it is important to take providers' responses into account.

CBO's estimates now assume that policy-induced changes in providers' revenues from Medicare would be partially offset when the change reduced revenues but not when it increased revenues. The presumption behind the one-sided offset assumption that CBO--and the Health Care Financing Administration--use is that providers are quick to respond to adverse shocks that would threaten their revenues but they accept favorable shocks as their due. But that assumption will overstate Medicare spending if a favorable offset--that is, reduced billing--occurs in response to a policy-induced increase in revenues. Because evidence is mounting that a favorable offset does occur, CBO is reassessing its assumptions in this area in an effort to incorporate such an offset appropriately.³³

CBO assumes that physicians are better able than hospitals and other institutional providers to offset potential reductions in revenues because they control the provision of most medical services. It is primarily the physician who determines what services will be provided once a patient has initiated a medical episode. The physician can at least partially offset revenue reductions by ordering more diagnostic tests, recommending more frequent follow-up visits, billing for services previously included as part of the charge for a visit (so-called unbundling), or--if payment rates are not set by the payer--increasing prices. Institutional providers' options for offsetting revenue reductions are somewhat more limited. To generate more admissions, they must influence the decisions of physicians. Once patients are admitted, however, they may increase revenues from some payers by unbundling or by increasing prices.

Compared with its offset assumptions for policies that would affect only Medicare payments, CBO assumes somewhat higher offsets when all payers

32. M. Fahs, "Physician Response to the United Mine Workers' Cost-Sharing Program: The Other Side of the Coin," *Health Services Research*, vol. 27, no. 1 (1992).

33. See S. Christensen, "Volume Responses to Exogenous Changes in Medicare's Payment Policies," *Health Services Research*, vol. 27, no. 1 (1992), which finds an offset of roughly 35 percent to revenue increases. See also J. Hadley and R. Lee, "Toward a Physician Payment Policy: Evidence from the Economic Stabilization Program," *Policy Sciences*, vol. 10 (1978-79); and Physician Payment Review Commission, *Annual Report* (1993), pp. 122-125.

would be affected by a proposal to reduce providers' revenues.³⁴ The offsets assumed for payment reductions that would affect all payers are

- o 55 percent on total physician/practitioner revenues; and
- o 15 percent on total hospital/institutional revenues.

When only Medicare's payments would be constrained, the offsets assumed for Medicare's spending are

- o 50 percent on physician/practitioner revenues from Medicare; and
- o 10 percent on hospital/institutional revenues from Medicare.

In the latter case, some of the remaining loss in providers' revenues arising from Medicare's constraints might be recovered from other payers through cost shifting (increasing the rates charged to other payers) or other means.

CBO always applies its offset assumptions in instances in which a revenue reduction would come about because of changes in payment rates. But it has not always applied them in the past in cases in which the revenue reduction would result from changes in copayment requirements that reduced patients' use of services. Recent evidence from a study by Fahs indicates that some offset may be appropriate in the latter instance as well, although the Fahs study does not permit quantification of the amount.³⁵

In its future work, CBO will apply the same offset value to any policy-induced reduction in providers' revenues--whether the reduction is due to changes in payment rates or to changes in copayment requirements. That assumption, however, may overstate providers' offsets to increased copayment requirements because providers' incentives to induce greater use of services would be working in opposition to patients' incentives to use fewer services. By contrast, when payment rates are reduced, incentives for both providers and patients would work to increase use of services because patients' copayment costs would typically fall along with payment rates.

34. Evidence from Canada--where all patients are covered by a single payer--indicates that physicians are not able to offset all of the insurer's cuts in payment rates, so a 100 percent offset assumption would be too large. In fact, some Canadian analysts believe that little offsetting occurs, perhaps because one of the primary factors that might encourage providers to adopt offsetting behavior--comparison with other payers' higher rates--is absent in a single-payer system.

35. Fahs, "Physician Response to the United Mine Workers' Cost-Sharing Program."

Examples Using Estimates of Health Care Demand

This section offers two examples that show the estimated effects of changing cost-sharing requirements or insurance coverage. The examples make allowance for providers' offsets where appropriate.

Example 3: Impose 25 percent coinsurance on home health services under Medicare. Use of home health services by Medicare enrollees who had no supplement to cover copayments would be reduced to about 83 percent of current levels under this approach. This example is an instance in which including an offsetting response by providers is appropriate, because Medicare pays for about 45 percent of home health care costs. The results shown below assume that home health providers have the same ability as hospitals to offset (by 10 percent) the loss in Medicare revenues that would otherwise occur from imposing copayment requirements on Medicare enrollees:

$$\text{New } Q = Q_0 * [0.81 + 0.1 * (1 - 0.81)] = Q_0 * 0.83,$$

using the plan effect for all insured services from Table 4 for the difference in use between a free plan and a plan with 25 percent coinsurance. Alternatively,

$$\text{New } Q = Q_0 * [0.82 + 0.1 * (1 - 0.82)] = Q_0 * 0.84,$$

using equation [B] on page 11 where

$$E = -0.1;^{36}$$

$$P_0 = 0;$$

$$P_1 = 0.25; \text{ and}$$

$$Q = \text{the cost of home health services used by the affected group of Medicare enrollees.}$$

Example 4: Replace all current insurance by a single-payer system with first-dollar coverage. This example assumes implementation of a single-payer plan with universal first-dollar coverage that would replace all existing insurance plans, both public and private. No change in average payment rates for providers is assumed. The example requires the use of behavioral estimates for changes in cost sharing and coverage and potentially would require making allowance for providers' responses to revenue changes as well. However, because the plan being examined would not reduce revenues for any providers, no provider offsets are included in the example. The people affected would

36. Although an arc elasticity of -0.2 might appropriately be used in this case (because the effective coinsurance rate is known both before and after the policy change), it gives a result that is clearly too small (at 0.67), considering the result obtained by using the more credible plan effect.

include all those who are currently uninsured or who have insurance with copayment requirements.

For those with insurance that includes copayment requirements, use of services would increase by 23 percent:

$$\text{New } Q = Q_0 * 1.23,$$

using Table 4 and assuming a current average coinsurance rate of 25 percent.³⁷

For those currently without insurance, use of services would increase by 93 percent:

$$\text{New } Q = Q_0 * 1.57 * 1.23 = Q_0 * 1.93,$$

using Tables 4 and 5. That result combines the effects of providing coverage with copayment requirements and then eliminating the copayments.

About 30 percent of the population already has first-dollar coverage through HMOs, Medicaid, or Medicare supplemented by medigap coverage. Those people would be unaffected by extending coverage or eliminating copayments, and no spending change is shown for them in this example. In reality, however, people in those groups would be affected under a single-payer plan if it changed the conditions under which they received care (by instituting different ways of managing care, for example).

37. If the RAND elasticity of -0.1 were used in this estimate, then new $Q = Q_0 * 1.22$.