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Supplementing Public Insurance Coverage with Private Coverage
Implications for Medical Care Systems

David M. Cutler

7.1 Introduction

A central question for governments running medical care systems is whether to allow people to supplement the public insurance policy. All developed countries insure a significant part of the population through public insurance. But not all services are covered publicly, or the services covered may not be of the highest quality. Governments thus need to decide whether people are allowed to purchase additional insurance to supplement the basic package and, if so, under what restrictions.

Supplemental health insurance may be of three types. The first, and most straightforward, is for services that are not covered under the public system. An example of such coverage is outpatient prescription drugs, which are omitted from Medicare in the United States and Canada. The second type of supplemental insurance is for the cost sharing required in public insurance systems. Medical systems frequently require beneficiaries to pay for part of the cost of their medical care utilization. If it is allowed, recipients of public insurance may purchase secondary insurance to reduce this cost sharing. The third type of insurance is for services that are covered under the public plan but for which private provision might be preferred to public provision. Because of tight budget constraints on service availability, some countries have waiting lines for access to specialty services. Some

people purchase private insurance to see providers outside of the public system, in effect jumping the public queue.

These three roles for supplemental insurance are very different, and thus their economic implications are different. Insurance for noncovered services is the least controversial. In most countries, the public sector allows or encourages such insurance. Such insurance may still have implications for the public sector, however. There are two ways this may occur. First, covered services may be complementary or substitutable for uncovered services. As the price of uncovered services changes, therefore, the demand for covered services may change as well. Second, the possession of private insurance might reduce poverty, reducing enrollment in other public health and income support programs.

Insurance for cost sharing required in the public system is more complex. On the one hand, allowing people to purchase such insurance reduces their exposure to financial risk, thereby increasing welfare. On the other hand, insurance for cost sharing creates a moral hazard, much of which is paid for by the public system. Because these public costs are not passed back to individuals purchasing private insurance, insurance to reduce cost sharing is in effect subsidized by the public sector. Whether supplemental policies to reduce cost sharing on net are welfare improving or decreasing depends on how the public system by itself compares to the optimal policy, and what the losses are from increased moral hazard.

Supplemental insurance for queue-jumping is perhaps the most controversial type of supplemental insurance. Some countries, such as Canada, prohibit physicians from accepting payment for services that are covered by the public sector. The government is concerned that if such payments are possible, the rich will buy increased access at the expense of the poor. But both rich and poor may benefit from this insurance, if increased demand by those with supplemental insurance leads to increased supply of medical resources.

This paper discusses these three types of supplemental insurance and presents empirical evidence on the effects of the first two. The empirical analysis focuses on the Medicare program in the United States, where supplemental insurance is extremely common—about 85 percent of Medicare recipients have additional coverage beyond the basic Medicare package. This insurance is used to insure uncovered services (primarily outpatient prescription drugs) and to reduce the cost sharing in the Medicare plan. In the United States, queue jumping is not important (because supply is essentially unlimited). I estimate that people with supplemental insurance coverage paying for Medicare cost sharing spend about 35 percent more on Medicare services than people without supplemental insurance coverage. However, supplemental insurance also limits poverty among the elderly. Keeping incomes high and thus keeping people off of other programs offsets nearly half of the moral hazard effect. In total, allowing supple-

Table 7.1   **Use of Supplemental Insurance in G7 Countries**

Country	Use of Supplemental Insurance
Canada	Uncovered services (prescription drugs)
France	Cost sharing
Germany	Uncovered services (amenities)
Italy	Queue jumping
Japan	Uncovered services (amenities)
United Kingdom	Queue jumping
United States	Uncovered services (prescription drugs); cost sharing

Notes: See Cutler (1999) for additional description. The United States row is for Medicare.

mental insurance leads to substantial cost increases for the public sector, but is not without benefits.

The next section of the paper discusses the three types of supplemental coverage theoretically. The third section presents basic information about supplemental insurance in the United States, and the fourth section estimates the impact of such coverage on medical care costs. The last section concludes.

7.2   Interactions Between Public and Private Insurance

Imagine a situation in which the government is providing health insurance to all or a portion of the population. The government has a benefit package that covers some services but not others. For example, the government might cover acute services but not long-term care services, or it might require substantial cost sharing under the basic insurance plan. Beneficiaries of the public program may want to supplement the public insurance plan with private insurance. Three types of supplemental insurance policies could be allowed.

7.2.1   Uncovered Services

The first type of supplemental insurance is for services that are not covered under the public insurance program. Table 7.1 shows countries that allow supplemental insurance for this purpose.[1] Among the Group of Seven (G7) countries, Canada, Germany, Japan, and the United States have supplemental insurance for this purpose. In Canada and the United States, the uncovered service is largely outpatient prescription drugs. In Germany and Japan, uncovered services include amenities, such as private hospital rooms, or minor services, such as eye and ear exams.

The public sector would appear, at first glance, to be indifferent to whether this insurance is provided. But insurance for noncovered services

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1. The entry for the United States is for the Medicare program.

will affect the public sector in two ways. The first link results from service complementarity or substitutability. Supplementary insurance lowers the price of the services it covers. This price reduction will increase use of those services. This will in turn affect use of covered services, either positively (if covered and uncovered services are complements) or negatively (if covered and uncovered services are substitutes).

An example of this substitution is provided by the Medicare program in the United States. As noted above, Medicare does not cover outpatient prescription drugs. Some people who value coverage for prescription drugs will obtain private insurance for it. Coverage for prescription drugs may increase or decrease use of hospital and physician services, which are covered by Medicare. If prescription drugs keep people out of the hospital (for example, antihypertensive medication that prevents strokes), people with private insurance coverage for prescription drugs will spend less on hospital care than will people without coverage for prescription drugs. If prescription drugs are associated with increased doctor visits, however (for example, for monitoring of antihypertensive medication), private coverage might raise the costs of the public program.

Supplementary insurance for uncovered services also affects the public sector by altering eligibility for other public programs. In most countries, low-income people are exempt from the cost sharing in public insurance systems. In the United States, for example, Medicaid covers the cost of medical care for low-income elderly with high medical expenses. Such people may also receive additional income support or assistance with in-kind goods such as housing and food. People who have coverage for supplementary services are less likely to spend a large share of income on medical care, and are thus less likely to fall below the income threshold. As a result, having supplemental insurance coverage may reduce spending on other public programs.

7.2.2   Cost Sharing

The second type of supplemental insurance is for cost sharing required under the public insurance plan. When the public insurance plan requires some cost sharing, people may be allowed to purchase insurance that pays for these out-of-pocket costs. Supplemental insurance to reduce cost sharing is common in France and the United States.

Allowing such policies reduces the financial risk that people bear. If public insurance systems are insufficiently generous, this is a welfare gain. But such policies also have a clear moral hazard effect. People who have insured their cost sharing will use more services than people who have not. For example, they may be more likely to visit doctors for routine care, or to be hospitalized in precautionary situations. Some of this additional utilization will be paid for by the private insurance, but other costs will be paid

Healthy
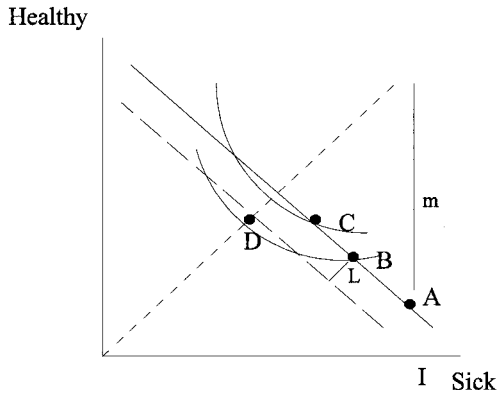
Fig. 7.1   The decision to purchase Medigap coverage

for under the public insurance policy. This will increase public spending on medical care.

Imagine, for example, that a person has a hospital deductible of $500. This deductible is sufficiently high that when the person has pneumonia he or she chooses to stay at home rather than entering the hospital. Now suppose the person buys private insurance that covers the $500 deductible. With no cost sharing required for a hospital stay, the person enters the hospital for pneumonia. The first $500 of this hospital stay is covered by the private insurance policy, but the rest is covered by the public policy. If the hospital stay costs $2,000, the cost to the public sector will be $1,500. In effect, the private insurance policy has induced moral hazard that is partly paid for by the public sector.

The moral hazard effect means that private insurance is implicitly subsidized by the public sector. The cost of the private policy is the expected cost of the $500 deductible, but the benefit of the policy is the expectation of the full $2,000 of medical services that it allows the individual to consume. Three-quarters of the cost of supplemental insurance is paid for by the public sector.

In such a situation, it is possible that increasing the generosity of the public program may actually *reduce* overall spending on the public program. I demonstrate this issue in figure 7.1.[2] Imagine an individual facing two possible health states: healthy and sick. Income is I in both states. An uninsured person who is sick would spend m on medical care. Thus, in the absence of insurance, the person will have consumption given by point A in figure 7.1: I when healthy and I-m when sick. The solid line passing through point A is the set of transfers that an insurance company can offer

2. The figure is based on the familiar Rothschild and Stiglitz (1976) analysis.

the person while not losing money. In the absence of moral hazard, the line would have slope equal to the negative of the inverse of the probability of being sick.[3] With moral hazard, the line has a flatter slope, reflecting the fact that medical and nonmedical consumption is diminished because of the additional medical care utilization.

Imagine that public insurance is incomplete. For example, the public sector might offer point B in the figure—income is smoothed, but there are still substantial liabilities when sick. The indifference curve associated with this insurance is also shown in the figure.

Suppose the person has access to a private insurance policy that provides full insurance, but at some administrative cost. If a person pays amount L, he can buy insurance to pay for the cost sharing in the public program. In figure 7.1, the consumer will choose to purchase the supplemental policy. Paying the transactions cost L allows the consumer to reach point D, which has higher utility than point B. The reason for the higher utility is that the value of increased risk sharing is greater than the administrative cost required to purchase the policy.

If the public insurance policy were made more generous, however, the supplemental policy would be less attractive. Imagine that the public policy were increased in generosity to point C. Utility at point C is higher than at point D, even though point D offers better insurance. The additional insurance is valuable, but not worth enough to overcome the transactions cost. Thus, when the policy is made more generous, fewer people buy the supplemental policy. Total medical spending will be lower at C than at D.

Even public-sector costs may fall, depending on how much of the increased costs of policy D are borne by the public sector. For example, if reducing the deductible to $250 would cause people not to purchase supplemental insurance but would lead to only half of the people with pneumonia entering the hospital, public-sector costs could decline by making the program more generous.

7.2.3   Queue Jumping

The third type of supplemental insurance is to finance services paid for by the public sector but in a more timely manner. In countries with supply-side constraints on medical service provision, as in most countries outside of the United States, there are frequently waiting lines to access medical services. Although emergency cases are often treated immediately, less urgent cases might have to wait a year or longer for treatment. People who place a high value on medical services might want to jump to the front of the line.

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3. Suppose the person pays a premium I independent of health state and receives m of medical services when sick. The insurance company's profit is given by $\pi = I - pm$. In a zero-profit equilibrium, the amount of money received when sick is $m = -1/p$ per dollar of insurance purchased.

Imagine a situation in which a person has injured his or her hip and is waiting for a hip replacement operation. Receiving the operation involves two steps: consulting an orthopedist and then having surgery. In a supply-rationed system, the wait for the orthopedist might be six months to a year, followed by another half-year wait for surgery. A person who does not want to wait in line may use private insurance to pay for a visit to an orthopedist. In countries that allow it, orthopedists will see patients outside of the public system in a much shorter period of time—perhaps a week or two. From there, the individual can join the waiting list for surgery in the public hospital, just as if he or she saw the orthopedist under the public system; or, in an extreme case, the insurance might pay for the cost of surgery. At minimum, private insurance can, at little cost, reduce the waiting time for surgery by half or more, without necessarily paying for the entire course of treatment.

Rich people can afford supplemental insurance more than poor people and may value shorter waits more highly. The fear that queue jumping is a device for the rich to get better medical care than the poor has led some countries to ban this form of insurance and even ban out-of-pocket payments for services covered by the public sector. In Canada, for example, doctors are not allowed to charge privately for services that are covered by the public sector.

But the poor are not necessarily worse off. The reason for this is that when people use supplemental insurance, some resources are freed up, and total supply may rise at the same public expense. Imagine in the example above that orthopedist appointments last one hour and that with no supplemental payments, the orthopedist works from 9 A.M. to 5 P.M. When supplemental payments are allowed, the orthopedist might still see publicly insured patients from 9 A.M. to 5 P.M. and then see privately insured patients after 5 P.M. Privately insured patients are better off, since they see the doctor sooner. Patients with public insurance are better off as well, since the doctor allocates the same time as he did previously but has fewer patients to see. Publicly insured patients do not have as significant a reduction in waiting times as privately insured patients, but they are still better off.

Even if no individual doctor works more hours, publicly insured patients might be made better off. When the rich opt to purchase services privately, there are more funds left in the public budget, and thus a greater ability of the public sector to expand total resource supply. If orthopedists see public patients only from 9 A.M. to 4 P.M., the public sector can pay 12 percent less (one out of every eight hours) for seeing public patients. With the money that is saved, more orthopedists can be hired. Indeed, the public sector can hire the equivalent of an additional hour for each orthopedist, making it as if each doctor worked an hour more.

The case where publicly insured patients are worse off is when total resource supply remains the same but the rich get served more rapidly. For

example, if physicians are paid on a salary basis and cut their time allotment to the public sector, without a reduction in salary, patients left in the public insurance plan will be worse off.

Of course, such an issue involves ethics as well as economics. One of the rationales for government provision of medical services is that countries do not want inequality in the provision of medical services (Cutler 2002). If inequality of medical care resources is bad inherently, supplemental insurance may be viewed adversely, even if the poor also receive more services.

7.3   Supplemental Insurance in the United States

I now turn to an empirical examination of the impact of supplemental insurance on the public sector. My analysis is focused on the Medicare program in the United States. Supplemental insurance for Medicare is available for uncovered services and cost sharing. I describe this insurance in this section and discuss its likely effects. In the next section, I examine the impact of supplemental insurance on public spending.

Medicare is the program that serves the aged and disabled population. Ninety percent of Medicare recipients are over age sixty-four; 10 percent qualify because of a disability. Most Medicare beneficiaries (about 85 percent) are enrolled in the traditional fee-for-service insurance plan. This plan, which is run by the federal government, has two types of benefits. Part A of the program provides inpatient benefits, including acute care services in inpatient hospitals and long-term care services, provided that they are related to an acute episode of care. Part B of the program covers outpatient services, including physician visits and laboratory services.

Table 7.2 shows information on payments for medical care services used by Medicare beneficiaries in 1995, taken from the *Medicare Current Beneficiary Survey* (MCBS). The top row shows that total spending for medical services for Medicare beneficiaries was $8,500 per person. Two-thirds of this amount ($5,697) was for acute care services, and one-third ($2,587) was for long-term care services.

As the next row shows, Medicare pays for only about half of medical services used by the elderly ($4,407). There are three reasons why the Medicare share is so low. First, Medicare requires substantial cost sharing. There is a large deductible for use of hospital care equal to the cost of one day in the hospital—$788 in 1998. Furthermore, the beneficiary pays for cost sharing for long-term hospital stays (above sixty days). For part B services, there is an annual deductible of $100, with a 20 percent coinsurance rate above that amount. There is no overall cap on beneficiary liability for Medicare.

This cost sharing is substantially greater than policies sold to the non-Medicare population. In 1999, for example, the average private fee-for-service policy for an individual had an annual deductible of $245. The coin-

Table 7.2   **Medical Spending for Medicare Beneficiaries, 1995**

	Total ($)
Total	8,463
Public	
Medicare	4,407
Medicaid	1,065
VA	66
Private—insured	
Employer	423
Individual	249
HMO	88
Unknown	46
Private—direct	
Out-of-pocket	1,605
Other	411

Source: Medicare Current Beneficiary Survey.

Note: Dental spending is not included in either acute or long-term care services. VA = Veterans' Administration

surance rate was typically 20 percent, with a maximum out-of-pocket payment by the individual of $1,500 or $2,000 (Kaiser Family Foundation 2000).

The second reason why Medicare's share of coverage is so low is that Medicare does not cover outpatient prescription drugs. Prescription drugs provided in a hospital are reimbursed as part of Medicare's payment to the hospital, but drugs taken on an outpatient basis are not covered by Medicare. The lack of prescription drug coverage is a reflection of when the program was enacted. In 1965, outpatient prescription drug coverage was not standard, and thus Medicare omitted this benefit. The program has not been changed to incorporate this coverage, even though essentially all private insurance coverage includes outpatient drugs. Medicare beneficiaries spend $568 annually on outpatient prescription drugs—half of which is paid for out of pocket. The biggest item in out-of-pocket spending for the elderly is outpatient prescription drugs.

The third reason why Medicare's share of costs is low is that Medicare's coverage of long-term care services is limited. Medicare pays for long-term care services only if the service is immediately related to an acute care episode. For example, a nursing home stay to recover functional mobility after a hip fracture would be covered by part A of Medicare, but a nursing home stay related to general aging and lack of functional capacity would not be covered. Long-term care provision in acute settings is a small part of total long-term care utilization: Medicare pays for less than 20 percent of total long-term care service use by the elderly.

7.3.1   Supplemental Coverage for Medicare Beneficiaries

For these and other reasons, many Medicare beneficiaries acquire insurance to supplement the Medicare package. This insurance is provided through one of four mechanisms. The first source of supplementary insurance coverage is from Medicaid. Medicare beneficiaries who are sufficiently poor, or whose medical costs leave them with sufficiently low income, will be covered by the Medicaid program. Medicaid pays for the cost sharing required under Medicare, outpatient prescription drugs, and long-term care services, making it the most complete form of supplemental insurance coverage. As figure 7.2 shows, about 13 percent of Medicare recipients are also covered by Medicaid.

Second, some employers provide coverage for services that Medicare does not cover. Employment-based supplementary insurance is a combination of insurance for cost sharing and insurance for uncovered services: It generally pays for the cost sharing required by Medicare and typically outpatient prescription drugs, but not long-term care services. About one-third of Medicare beneficiaries have supplemental insurance from a current or former employer.

Third, individuals can join a health maintenance organization (HMO) serving the Medicare population. HMOs contracting with the federal government agree to provide at least the Medicare package for an amount roughly equal to 90 percent of average spending in the fee-for-service program in that area. In practice, most HMOs have very low cost sharing for service use—$10 per visit or less. Because HMOs enroll healthier people than average, their costs are below those in the fee-for-service program. To attract enrollees, HMOs offer additional benefits, including coverage of outpatient prescription drugs. Nearly 15 percent of Medicare beneficiaries are enrolled in an HMO, and about half of those have coverage for outpatient prescription drugs.
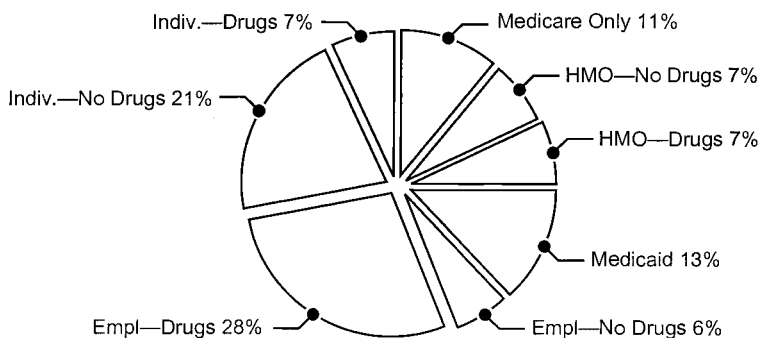
Fig. 7.2   Insurance coverage for Medicare beneficiaries
Source: MCBS (1995).

Table 7.3   **Description of Medigap Plans**

	A	B	C	D	E	F	G	H	I	J
Basic	X	X	X	X	X	X	X	X	X	X
Hospital deductible		X	X	X	X	X	X	X	X	X
SNF coinsurance			X	X	X	X	X	X	X	X
Part B deductible			X			X				X
Physician balance billing						X	X[a]		X	X
Emergency care outside										
United States			X	X	X	X	X	X	X	X
At-home recovery				X			X		X	X
Preventive care					X					X
Basic drug coverage								X	X	
Extended drug coverage										X
Price range ($)										
Low	639	900	775	1,236	1,284	1,176	1,416	1,860	2,172	2,172
High	1,665	2,001	1,271	1,395	1,284	2,449	1,436	1,896	2,987	3,144

Notes: Basic coverage pays for coinsurance for long-duration hospital stays and coinsurance for part B services. The at-home recovery benefit is for cost sharing for long-term care services related to an acute episode. Preventive care is up to $120 per year if ordered by a doctor. Basic drug coverage is 50 percent coverage after a $250 deductible, up to a maximum benefit of $1,250. Extended drug coverage has a maximum of $3,000. Prices are for a male, aged 65, living in Los Angeles County, and were obtained from quotesmith.com.

[a]Pays for 80 percent of balance billing.

Fourth, individuals can purchase private insurance coverage that supplements Medicare, termed "Medigap" insurance. About one-third of Medicare beneficiaries purchase Medigap insurance. The individual Medigap insurance market is highly regulated. Since 1990, there have been ten standard Medigap plans, the details of which are shown in table 7.3. The most common policies are plans C and F, which cover cost sharing required under Medicare and, in the case of plan F, balance billing charged by the physician.[4] The premium for these plans ranges from $1,000 to about $2,500.

Three of the Medigap plans offer some coverage for outpatient prescription drugs, but these plans are not very popular. This unpopularity largely reflects adverse selection. Plans with drug coverage cost about $700 more than the plans without drug coverage, even with a maximum payment for drug benefits of $1,250 to $3,000. As a result of this adverse selection, most people with individual supplemental insurance do not have coverage for outpatient prescription drugs. Furthermore, long-term care services are not covered by Medigap policies. Although there is some insurance for long-term care, it is not very widespread (Cutler 2002): Only about 4 per-

4. Medicare calculates patient cost sharing on the basis of its fee schedule. Physicians can, in some circumstances, charge more than the fee schedule. The entire amount of this excess billing, or balance billing, is charged to the patient.

cent of the elderly have long-term care insurance. Most elderly people rely on the Medicaid program as their implicit long-term care insurance policy. Effectively, individual Medigap insurance serves as supplementary coverage to reduce Medicare cost sharing.

As figure 7.2 shows, in total nearly 90 percent of Medicare beneficiaries have some form of supplemental insurance coverage. Supplemental insurance coverage varies substantially with income, although the relationship is not linear. Figure 7.3 shows the share of the elderly with different forms of supplemental insurance coverage by income. About 40 percent of the poorest elderly (those with income below $10,000 per year) have supplemental coverage through Medicaid. Only 10 percent have employer-based insurance, and 25 percent purchase insurance individually. At more moderate income levels (between $10,000 and $15,000), individual insurance predominates, with Medicaid coverage being relatively unimportant. Finally, at higher incomes (about $15,000 and particularly above $30,000), most supplemental insurance is from employer-sponsored plans, with a residual share for individual coverage.

As a result of these offsetting trends, the share of the elderly with any supplemental insurance does not rise particularly rapidly with income— ranging only from 85 to 95 percent. What does change, however, is the probability that an individual has coverage for the most important omitted category in Medicare—outpatient prescription drugs. As figure 7.4 shows, the poorest and richest elderly are more likely to have prescription drug coverage than are the lower-middle-income group. This lack of prescription drug coverage for the nearly poor has raised substantial policy concern (McClellan 2000).

7.4   Moral Hazard and Service Substitution

The question for economic research is how the presence of supplemental insurance affects the costs of the Medicare program and the welfare of Medicare beneficiaries. Queue jumping is not a concern in the United States (supply is effectively unlimited), but moral hazard and service substitution are. I thus examine how the presence of supplemental insurance affects medical care spending, taking account of both service substitution and moral hazard effects.

To test the impact of insurance for cost sharing on Medicare spending, I relate Medicare spending for each individual to indicators for whether the person has supplemental insurance coverage that pays for the cost sharing required in Medicare. The moral hazard theory suggests that each of Medicaid, individual Medigap, and employer Medigap insurance should raise Medicare spending. To test whether coverage for prescription drugs affects spending on covered services, I include a separate dummy variable for whether the person has prescription drug coverage. This effect may be
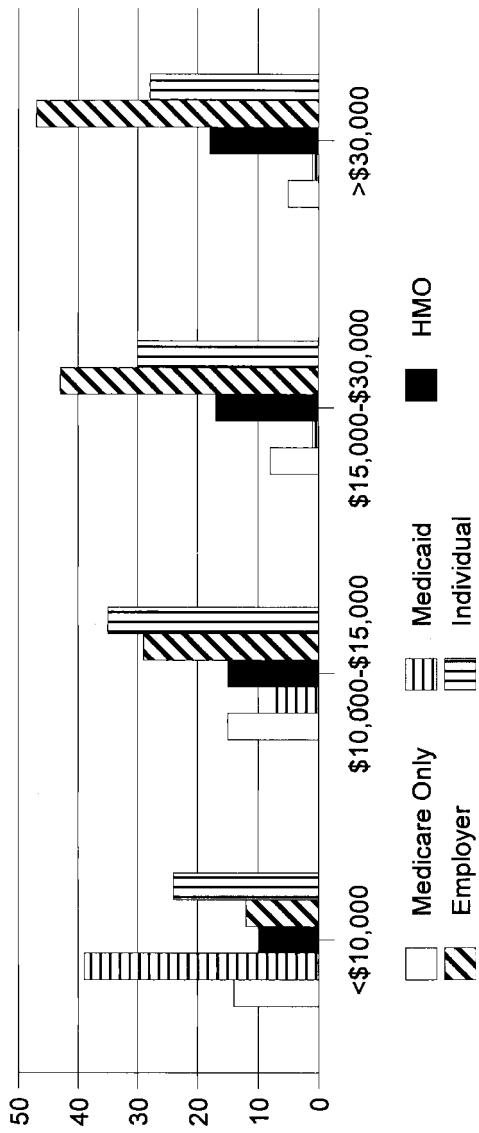
Fig. 7.3 Supplementary insurance coverage by income
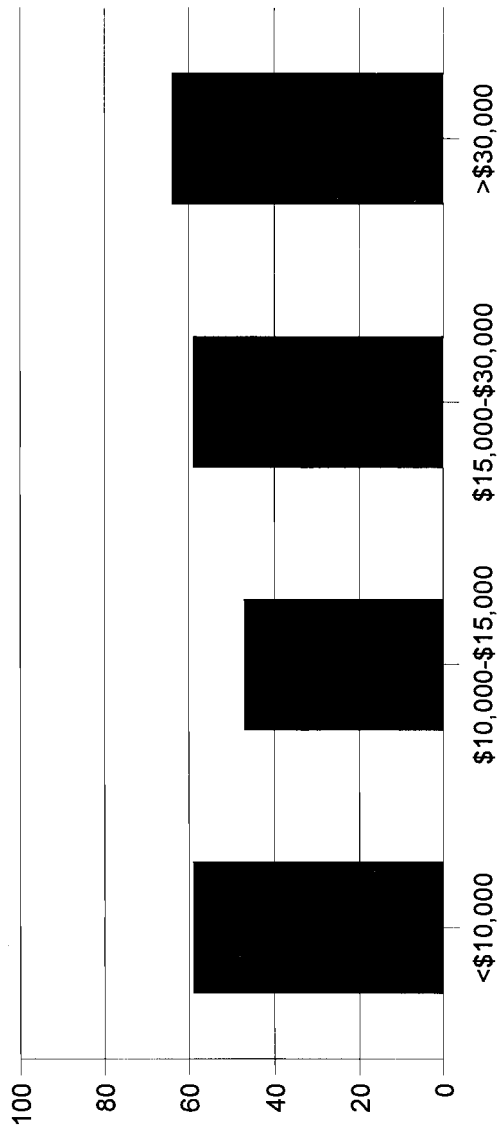
Source: MCBS (1995).

Fig. 7.4 Prescription drug coverage by income

positive or negative, depending on whether drug coverage is complementary or substitutable for the services covered by Medicare.

The regressions are of the following form:

(1)   Medicare Spending $= \alpha_1 \cdot$ Medicaid $+ \alpha_2 \cdot$ Individual Medigap

$$+ \alpha_3 \cdot \text{Employer Medigap}$$

$$+ \alpha_4 \cdot \text{Drug Coverage} + X\gamma + \varepsilon.$$

One could, in principle, include HMO coverage in equation (1), but data on medical care spending are not reported for people in HMOs. Thus, this group is omitted from the regression model.

The central difficulty of estimating equation (1) is the possibility of adverse selection. If people who are sicker are more likely to obtain supplemental insurance, then it will appear as if insurance drives up medical spending when in fact this is not the case. This is particularly important in the case of Medicaid, where people enroll in the system because they are sick. But the converse may also be true: Since richer people are more likely to have private supplemental insurance than are poorer people, and richer people are on average in better health than poorer people, supplemental insurance may appear not to affect Medicare spending when it might in practice do so.

The selection problem is likely to be most severe for the Medicaid population, since eligibility for Medicaid is largely determined on the basis of high medical costs. I thus focus the analysis principally on private supplemental insurance. Even with this focus, the issue of selection remains. Without an instrumental variable that is correlated with insurance purchase but not with health status, there is no good solution to this problem. I do not have such an instrument. Instead, I control for selection by including a number of measures of health status in the X variables. If I can adequately control for the factors about health status that predict insurance choice, I will be able to estimate the moral hazard and substitution components of supplemental insurance. The MCBS (1995) includes an extremely wide range of health measures, including self-reported health status (excellent, very good, good, fair, or poor); trouble with hearing and vision (none, some, a lot, or deafness or blindness); whether health limits the person's social life (never, some of time, most of time, all of time); the number of impairments in activities of daily living (ADLs) and instrumental activities of daily living (IADLs)[5] (no impairments, IADL limitations only, one to two ADL impairments, three to four ADL impairments, five or more ADL impairments); whether the person ever or currently smokes; whether the person has trouble eating solid foods; whether the person has

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5. ADLs are physical measures, such as the ability to bathe oneself. IADLs are functional measures, such as the ability to manage money and cook.

had a hysterectomy; and whether the person has been told by a doctor that he or she has any of a number of chronic conditions (hardening of the arteries, hypertension, angina pectoris, other heart conditions, stroke, skin cancer, other cancer, diabetes, rheumatoid arthritis, arthritis, mental retardation, Alzheimer's disease, mental disorders, osteoporosis, broken hip, Parkinson's disease, emphysema, and partial paralysis). I include dummy variables for all of these measures.

In addition, I control for demographic characteristics of the individual, including age (in five-year age groups), sex, race (black, other), and the logarithm of family income.

Since medical care spending is skewed, there is a question about the appropriate specification of the dependent variable in equation (1). Sophisticated models of spending use a two-part framework: a model for the use of any services combined with a model for spending conditional on use of services. For simplicity, I estimate only linear models of medical spending. For the type of effects I am interested in, this specification seems appropriate.

The first two columns of table 7.4 report estimates of equation (1). Column (1) does not include any of the health status measures: They are included in the second column. Comparing the columns is an indication of how important health-based selection into supplemental insurance is in explaining Medicare spending.

The estimates on individual insurance and employer-based insurance are generally similar in the first two columns. Supplemental individual or employer-based insurance raises Medicare spending by about $1,500 without health controls and $1,800 with health controls. In each case, the effects are statistically significantly different from zero. In both equations, I cannot reject the hypothesis that the coefficients on individual and employer-based coverage are the same. Since selection into these two types of insurance is likely to be very different, these results lend some confidence to the idea that selection is not a particular problem in these results. Furthermore, the coefficients on both variables are remarkably similar with and without the control variables. This further suggests that selection is not a concern. Indeed, the increase in the coefficients between columns (1) and (2) indicate that selection into supplemental insurance coverage is favorable: The correlation between income, average health, and purchase of insurance is stronger than the selection into insurance by sicker people within any income group.

I find that, consistent with the concern about the endogeneity of Medicaid, controlling for health status substantially reduces the coefficient on this variable. In the second column, it suggests roughly the same moral hazard as employer and individual insurance.

The magnitude of moral hazard implied by the estimates for employer and individual supplemental insurance is high. Medicare spending is about

Table 7.4   **Regression Models for Medical Care Spending**

Independent Variable	Medicare Spending		Prescription Drug Spending	
	(1)	(2)	(3)	(4)
Supplemental insurance (base = none)				
Individual Medigap	1443**	1777**	121**	92**
	(352)	(346)	(22)	(20)
Employer Medigap	1697**	1799**	191**	146**
	(444)	(433)	(27)	(25)
Medicaid	4584**	2799**	14	–62*
	(575)	(568)	(35)	(36)
Prescription drug coverage	–447	–194	117**	130**
	(385)	(372)	(24)	(22)
Self-reported health status (base = excellent)				
Very good	—	49	—	63**
		(411)		(24)
Good	—	790**	—	154**
		(415)		(24)
Fair	—	837*	—	215**
		(503)		(29)
Poor	—	1730**	—	195**
		(703)		(41)
Activity limitations (base = none)				
IADLs only	—	–210	—	9
		(446)		(26)
1–2 ADLs	—	2024**	—	90**
		(370)		(22)
3–4 ADLs	—	1580**	—	27
		(542)		(32)
5+ ADLs	—	3889**	—	1
		(627)		(37)
Health limit social life (base = none of time)				
Some of time	—	953**	—	83**
		(371)		(22)
Most of time	—	1948**	—	114**
		(544)		(32)
All of time	—	5140**	—	124**
		(640)		(37)
Smoking Status				
Ever smoked	—	837**	—	36**
		(309)		(18)
Current smoker	—	508	—	–54**
		(427)		(25)
Trouble eating solid foods	—	111	—	38*
		(397)		(23)
Ever had hysterectomy	—	287	—	56**
		(385)		(23)
Ever had cataract	—	708*	—	67**
		(343)		(20)

(*continued*)

Table 7.4 (continued)

Independent Variable	Medicare Spending		Prescription Drug Spending	
	(1)	(2)	(3)	(4)
Diagnosed conditions				
Hardening of arteries	—	–126	—	54**
		(405)		(24)
Hypertension	—	–236	—	183**
		(274)		(16)
Heart Attack	—	783*	—	112**
		(417)		(24)
Coronary heart disease	—	853**	—	146**
		(413)		(24)
Other heart disease	—	1046**	—	85**
		(321)		(19)
Stroke	—	488	—	8
		(449)		(26)
Skin cancer	—	–329	—	22
		(363)		(21)
Other cancer	—	694**	—	55**
		(345)		(20)
Diabetes	—	3149**	—	210**
		(365)		(21)
Rheumatoid arthritis	—	–253	—	79**
		(419)		(25)
Arthritis	—	–555**	—	74**
		(278)		(16)
Mental retardation	—	–1719	—	–150
		(1671)		(98)
Alzheimer's	—	–1948**	—	–309**
		(692)		(40)
Mental disorders	—	334	—	27
		(657)		(38)
Osteoporosis	—	62	—	57**
		(453)		(27)
Broken hip	—	914	—	–73**
		(612)		(36)
Parkinson's	—	548	—	326**
		(1065)		(62)
Emphysema	—	1498**	—	216**
		(356)		(23)
Partial paralysis	—	604	—	–70**
		(601)		(35)
Trouble with vision (base = no trouble)				
Little trouble	—	–764	—	–9
		(1673)		(98)
Lots of trouble	—	33	—	–4
		(300)		(18)
Blind	—	19	—	3
		(481)		(28)

(*continued*)

Table 7.4   (continued)

Independent Variable	Medicare Spending		Prescription Drug Spending	
	(1)	(2)	(3)	(4)
Trouble with hearing (base = no trouble)				
Little trouble	—	–1806	—	–301*
		(2842)		(166)
Lots of trouble	—	–714**	—	–12
		(287)		(17)
Deaf	—	–469	—	4
		(518)		(30)
Demographics	Yes	Yes	Yes	Yes
N	8,100	8,100	8,100	8,100
R^2	.022	.095	.031	.193

Source: Data are from the 1995 MCBS.

Note: The sample is elderly people who are not enrolled in an HMO.

**Statistically significant at the 5 percent level. Dashes indicate that information was not included in the model.

*Statistically significant at the 10 percent level.

$5,000 per person for this population. Thus, the increase in spending resulting from supplemental insurance is about 35 percent. Other estimates in the literature suggest that Medigap insurance raises Medicare spending by about one-quarter. The higher estimates in these data may reflect an inability to adequately control for selection, but the similarity of the coefficients between the first and second columns argues against this explanation. The large coefficients in comparison to previous estimates may alternatively indicate that the degree of moral hazard has increased over time.

The coefficient on drug coverage does not suggest any clear effect of this variable on spending for covered services. Having drug coverage lowers spending on covered services by $200 per person, but this effect is not statistically significant. I therefore conclude that lowering the price of prescription drugs to the elderly does not materially affect their use of Medicare-covered services.

The coefficients on the health status measures are generally along the lines one would predict. Worse health is associated with increased spending. This is particularly true for self-reported health status (poor health adds $1,700 per year); health limiting one's social life (substantial limitation adds $5,100 to spending); ADL limitations ($2,000 to $4,000 more); smoking (smokers spend $800 more), heart disease ($1,000 more), diabetes ($3,100 more), and emphysema ($1,500 more).

As an additional test of whether insurance is accurately capturing incentive effects and not just omitted health status, the last two columns of the table report models for prescription drug spending. The theory sug-

gests that people with supplemental drug coverage should spend more on prescription drugs than people who do not have such coverage.

The estimates confirm this theory. People with supplemental drug coverage spend about $130 more on prescription drugs per year. The effect is similar with and without the controls for health status. The moral hazard implied by this estimate is also large. Average spending on prescription drugs is about $550 per person. Compared to this, the additional use for people with employer insurance is about 25 percent.

Conditional on prescription drug coverage, people with employer and individual insurance spend more on drugs than those with Medicare coverage alone. Again, the coefficients are similar on these two variables. This is consistent with acute care and pharmaceutical use being complementary; encouraging people to visit the doctor more results in more prescribed medications.[6] Finally, Medicaid recipients consume fewer prescription drugs, given their health state and their coverage for prescription medications.

There is an additional path through which supplemental coverage may influence public-sector medical spending. If people with supplemental insurance are less likely to incur high medical spending for out-of-pocket needs, they may be less likely to enroll in Medicaid. This could reduce public spending on medical care and other social services.

To examine this issue, I relate receipt of Medicaid to coverage for prescription drugs. The equations are of the following form:

$$(2) \quad \text{Medicaid Coverage} = \beta_1 \cdot \text{Medicaid} + \beta_2 \cdot \text{Individual Medigap}$$
$$+ \beta_3 \cdot \text{Employer Medigap}$$
$$+ \beta_4 \cdot \text{Private Drug Coverage} + X\delta + \varepsilon.$$

A negative coefficient on supplemental coverage would indicate that such coverage prevents people from spending down onto Medicaid.

Table 7.5 shows the estimates of equation (2). As with the earlier equations, I include a variety of health status controls to control for selection. Recall also that income is also included in the regression, so that the link between supplemental coverage and Medicaid coverage is not a result of differences in coverage by income group. Supplemental insurance is associated with a significant decrease in the probability of enrolling in Medicaid. People with insurance for Medicare cost sharing (employer or individual) are about 25 percentage points less likely to enroll in Medicaid than

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6. Because these are uncompensated substitution effects and not compensated substitution effects, the effect of drug prices on other acute spending need not equal the effect of other acute prices on drug spending if the income effects differ. Having coverage for other acute costs raises income sufficiently to induce additional drug spending. The additional income from having prescription drug coverage does not lead to any increase in use of other services, however.

Table 7.5   **Impact of Supplemental Insurance Coverage on Medicaid Coverage**

Variable	Coefficient
Supplemental insurance (base = none)	
Individual Medigap	–.271**
	(.008)
Employer Medigap	–.244**
	(.010)
Private drug coverage	–.014
	(.009)
Health status controls	Yes
Demographics	Yes
N	8,100
R^2	.430

Note: Regressions are for people aged 65 and older.

**Statistically significant at the 5 percent level.

*Statistically significant at the 10 percent level.

are those without such coverage. Private drug coverage is associated with a 1.4 percentage point reduction in the probability of Medicaid coverage (statistically significant at the 11 percent level).

The implications of these changes are large. Consider the experiment of giving everyone without supplemental insurance coverage a policy equivalent to the average individual policy currently chosen, along with prescription drug coverage. The estimates in table 7.4 indicate that spending on Medicare covered services would increase by $473 per beneficiary. At the same time, the estimates in table 7.5 indicate that this change would reduce the probability of Medicaid coverage by 8 percentage points. Since Medicaid increases spending by about $2,800 per person (table 7.4), the savings from reduced Medicaid utilization would be about $224 per beneficiary. Thus, nearly half of the cost of supplemental insurance in higher Medicare spending would be offset by health savings in the Medicaid program. In addition, there would be savings in reduced income payments and potentially other transfers as well, such as food stamps. The net effect could be even smaller.

As a result, encouraging people to purchase supplemental insurance coverage privately—as Medicare's implicit subsidy to first-dollar coverage does—costs less than the static moral hazard analysis suggests. And tailoring such policies to the group most likely to go on Medicaid may actually save money.

7.5   Discussion

The most important role of supplemental health insurance among Medicare beneficiaries in the United States is to reduce cost sharing in the

Medicare program. My estimates suggest that Medicare spending is increased by about 35 percent for people with supplemental insurance coverage over equivalent people without supplemental coverage. This estimate may be somewhat high, because of omitted measures of health status, but even a coefficient half this size would imply significant moral hazard.

Coverage for uncovered services does not have a direct effect on public spending. People with supplemental insurance that covers outpatient prescription drugs spend no more or less on Medicare than do people without such coverage. But supplemental insurance reduces spending through other mechanisms by reducing eligibility for the Medicaid program. The "Medicaid offset" implies that the net cost of supplemental insurance coverage is perhaps half of the gross cost, taking account only of Medicaid spending on Medicare-covered services. Savings in other programs could be large as well.

In some countries, although not the United States, there is a further role of supplemental insurance in allowing people to jump to the front of waiting lines. Because this role is not important in the United States, I do not analyze it empirically. It would be worthwhile to consider this in future work focused on other countries.

This research highlights the critical importance of the design of basic benefit packages. One reason why supplemental insurance policies are so popular is that the Medicare benefit package leaves substantial cost sharing to the individual. It may be efficiency-enhancing to reduce the cost sharing facing beneficiaries and thus reduce the financial risk facing Medicare beneficiaries without supplemental coverage. Estimating what such cost sharing would optimally be and how it would interact with supplemental insurance coverage is an important research priority.

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