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Adverse Selection and Adverse Retention

By DANIEL ALTMAN, DAVID M. CUTLER, AND RICHARD J. ZECKHAUSER*

Most employers providing health insurance offer a menu of plans and allow employees to choose the plan they prefer. As a result, the demographic mixes of insureds and, consequently, costs differ dramatically across plans. The average 60-year-old, for example, spends more than twice as much annually as the average 30-year-old. A single high-cost individual can incur costs equal to the total of several hundred low-cost insureds. Because of this variability, insurers are deeply concerned about how people choose their plans, as are employers and governments that finance and monitor them, and analysts who study them. We seek to understand who insures in which health-insurance plan, and why they do it. This information will enable us to correctly calculate cost differentials between plans, and to set premiums accordingly.

The mix of people in a plan in a particular year depends on who began there, and who moves in and out. Economists have long been fascinated by the movers. The tendency for sick (healthy) people to join plans offering rich (lean) services at high (low) cost is termed “adverse selection” (Michael Rothschild and Joseph Stiglitz, 1976; Charles Wilson, 1987). Most discussion of adverse selection, concentrating on the decision of whether to purchase insurance, focuses on high risks moving to very generous plans, with the low risks choosing to go without insurance coverage. But for mandatory or heavily subsidized insurance, such as employer-provided health care, everybody will be insured, and

thus other groups might be important as well: low-risk movers seeking lower prices, new enrollees, and people who stay put.

We focus in this paper on why premiums differ so much across health-insurance plans. We show that adverse selection is quantitatively important, but that it is more a result of low-risk people moving out of generous plans than of high-risk people moving into those plans. We then document the opposite of adverse selection, a concept we term “adverse retention.” Adverse retention is the tendency for people who stay put to magnify cost differentials between plans, as they will if they differ in age and costs are more than linear with age. We show that adverse retention has about 60 percent as large an effect on health-plan premiums as does adverse selection.

I. The Setting

To analyze the factors accounting for differences in plan premiums, we obtained data on plan enrollment and utilization for people insured through the Group Insurance Commission (GIC) of Massachusetts. The GIC provides health insurance to state and local employees in Massachusetts. With roughly 133,000 employees and 245,000 total lives, it is among the largest insurance purchasers in New England (see Cutler and Zeckhauser [1998] for more description). We secured complete expenditure and plan membership records for GIC enrollees for the 30-month period from July 1993 through December 1995 (fiscal years 1994, 1995, and half of 1996).

The GIC offers three types of health-insurance plans. A traditional indemnity policy is the most generous, imposing few restrictions on utilization and only moderate cost-sharing. The second plan is a Preferred Provider Organization (PPO). Its enrollees are steered toward “network” providers, but the providers are still paid on a fee-for-service basis, and the restrictions on utilization are mild. Ten HMO’s comprise the most stringent plans.

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TABLE 1—PLAN PREMIUMS, ENROLLMENT,
AND BENEFIT COSTS

Plan	Premium (\$)	Enrollment	Benefit cost (\$)	Adjusted benefit cost (\$)
Indemnity	2,670	66,253	2,176	1,908
PPO	1,631	24,032	1,115	1,202
HMO	1,686	117,501	1,233	1,320
Difference:				
Indemnity – HMO	984	—	943	588

Notes: Data are for fiscal year 1995. Adjusted benefit costs control for differences in the age and sex mix of each plan. Enrollment and benefit costs include only individuals under age 65.

HMO enrollees are required to use particular providers, who are paid on a salary or “capitation” (a single amount per patient per year) basis. The HMO’s rely heavily on utilization review.

The first column of Table 1 shows average per capita premiums (employer plus employee payment) in fiscal year 1995. The indemnity policy is significantly more expensive (by about \$1,000 per person per year) than the other policies. The difference between the indemnity and HMO premiums has been substantial for at least the past decade; the PPO has been priced at about the level of the HMO’s since just after it was introduced.¹ Despite its far greater cost, enrollment in the indemnity plan has remained relatively stable at about 32 percent of total nonelderly enrollees (the second column of the table). The bulk of the remainder enroll in an HMO; as a result, we focus on indemnity–HMO differences.

The third column shows average claims paid in the different plans (termed “benefit costs”). Benefit costs are much lower than premiums; part of the difference may arise because we are missing some claims information. But more importantly, benefit costs differ by virtually the same amount across plans as

plan premiums. If administrative expenses varied significantly across plans, premiums less benefit costs would vary in like amount. Table 1 suggests that administrative expenses do not vary significantly across plans.

A central question for insurance plan design is why the indemnity policy is so expensive relative to the PPO and HMO’s. The two major possibilities are differences in population mix and management differences (e.g., more stringent utilization management or lower prices paid in the HMO’s). In ongoing work, we are comparing the management of similar conditions across plans. Our focus in this paper is on the effect of population mix across plans.

To investigate the role of demographics in explaining premium differences, we form a measure of “adjusted” benefit costs. We take plan-specific spending by age and sex and then estimate benefit costs as if the age and sex mix in the GIC as a whole were enrolled in each plan. The difference between adjusted and unadjusted benefit costs indicates the importance of demographics in explaining premium differentials. A comparison of the last two columns shows that demographics are very important for cost differences; demographic differences explain 38 percent of the difference in plan costs ($[1 - \$588/\$943] \times 100$).²

II. Adverse Selection and Adverse Retention

How much of the cost differential between the indemnity plan and the HMO’s is due to people switching plans in light of their health state (adverse selection), and how much is due to the fact that people within plans differ in mix and do not switch plans (adverse retention)? Table 2 provides evidence about forces affecting the enrollment mix. We show statistics on people in the fiscal years 1994–1995 period, and the fiscal years 1995–1996 period.

¹ The PPO was first offered in 1994. It was priced high that year because enrollment was uncertain. Favorable experience in 1994 led the plan sponsors to lower the premium. It has remained about the level of the HMO’s since 1995.

² Similar conclusions about the importance of demographics in the GIC are obtained by Arlene Ash et al. (1997). In other groups, demographics are less important in plan premiums (Randall P. Ellis, 1989). Beyond demographics and management differences, the incidence of disease may vary across plans. In ongoing work, we are exploring this (see also Wei Yu et al., 1998).

TABLE 2—CHARACTERISTICS OF MOVERS AND STAYERS

Characteristic	FY 1994–FY 1995		FY 1995–FY 1996	
	Indemnity	HMO	Indemnity	HMO
Number of people				
Stayers	62,369	108,369	59,725	109,859
Movers (number in initial plan)	1,474	1,039	1,367	734
New enrollees	2,452	7,058	1,722	6,283
Average spending				
Stayers, first year	\$2,252	\$1,125	1,981	1,327
Movers, first year	<i>1,444*</i>	<i>1,651*</i>	1,381*	1,385
Stayers, second year	\$1,960	\$1,344	—	—
In-migrants, second year	<i>2,095</i>	<i>1,181</i>	—	—
New enrollees, second year	1,433*	1,042*	—	—

Notes: Numbers are adjusted for the age and sex mix of the GIC as a whole. Movers in the first year are in-migrants in the second year, as the italics and underlining indicate.

* Significantly different ($P < 0.05$) from the value for stayers.

The first rows report the number of people staying in their health plan, the number moving to new plans, and the number of new enrollees. About 2 percent of people who were in the indemnity plan moved to an HMO each year, and about 1 percent of HMO members moved in the reverse direction.³

The next rows show costs for these groups of people, adjusting for demographic differences across the groups.⁴ We present spending data for fiscal year (FY) 1994 and FY1995; because we only have claims for half of FY1996, we do not present data for that year. Adverse selection is clearly present; movers are far from representative of their plan. People leaving the indemnity plan for an HMO, for example, spent 30–36 percent less than people who remained in the indemnity plan in each year (for example, \$1,444 vs. \$2,252 in FY1994). This is true in both years of the data.⁵ Adverse selection is present among

³ The fact that plan mobility is so low, as it is in many other groups (Joachim Neipp and Zeckhauser, 1985), suggests that adverse retention might be important.

⁴ We also examined hospitalization probabilities for the different groups and found similar results.

⁵ Similar findings are true for Medicare. People who joined an HMO spent only 63 percent as much in the six months prior to HMO enrollment as people who remained in the fee-for-service system (Physician Payment Review Commission, 1996). But in the Medicare program, no data are available on spending while enrolled in an HMO.

TABLE 3—EFFECT OF ADVERSE SELECTION AND ADVERSE RETENTION ON BENEFIT COSTS

Effect of:	Indemnity	HMO	Net
Adverse selection			
Movers	\$16	–\$9	\$25
New enrollees	\$20	\$19	\$1
Adverse retention	\$23	\$9	\$14

Note: Data are adjusted for demographic differences across groups.

movers in the other direction as well; people who left an HMO for the indemnity plan after FY1994 used 47-percent more services in FY1994 than those remaining in an HMO the next year, although people who left the HMO after FY1995 were only about average compared to those who remained in an HMO in FY1996.

Once people change plans, however, their spending is only about average for enrollees in the new plan. People who move from an indemnity plan to an HMO in FY1995, for example, incur approximately average costs for HMO enrollees that year (\$1,181 vs. \$1,344); the same is true for people who join the indemnity plan.

To allow a rough calculation of the importance of adverse selection, we assume that there was no mobility between FY1994 and FY1995, and that the movers would have spent the same share relative to the stayers in FY1995 as they did in FY1994. As Table 3 shows, without mobility the indemnity plan's average costs would have been \$16 lower (about 1 percent). Spending in the HMO's would have been \$9 higher (about 1 percent). The relation of these two numbers is striking. Two-thirds of total adverse selection results from low-cost people moving out of the generous plan; only one-third results from high-cost people moving into the generous plan.

In addition to adverse selection from movers, there may also be adverse selection from joiners (new enrollees). To estimate this component of selection, we find the effect of the new enrollees on premiums. As Table 3 shows, new enrollees reduced costs in the indemnity policy by \$20 per person and costs in the HMO's by \$19 per person. While these

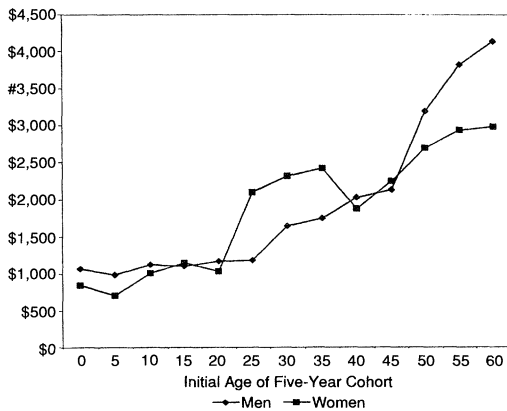


FIGURE 1. MEDICAL SPENDING BY AGE

effects are large, they are virtually the same for the two plans. Adverse selection results primarily from people switching plans, not from new enrollees disproportionately moving into certain plans.

We next explore the impact of adverse retention. Adverse retention will only affect plans differently if medical spending is non-linear in age. Figure 1 shows that this is the case; for men, in particular, costs increase quite rapidly between ages 55 and 64. Plans with people aging into or within this group will therefore experience above-average increases in medical spending. To evaluate the impact of adverse retention, we simulate the effect of the stayers on plan premiums. We take the FY1994 demographic distribution of stayers in each plan and age them by one year, holding constant age- and sex-specific spending by plan. As Table 3 shows, the increasing age of the stayers would raise the cost of the indemnity plan by \$23 (about 1 percent) and would raise the cost of the HMO's by \$9 (about 1 percent). The net effect of adverse retention in driving cost differentials is therefore about \$14. Thus, adverse retention is roughly 60 percent as important as adverse selection in driving up the costs of the indemnity plan.

In addition to adverse selection and adverse retention, demographic differences have a direct effect on plan spending. Based on demographic mix alone, if costs in the indemnity policy applied to all individuals, we estimate that those enrolled in HMO's would spend

\$390 less per person than would those with indemnity policies.⁶

III. Implications

Differences across plans in the mix of enrollees are a serious concern in health-insurance markets. These differences are large and have increased over time. Changes in the demographic mix result from adverse selection, but also significantly from adverse retention: the fact that few people change plans, and costs rise at an increasing rate with age. We estimate that adverse retention is roughly three-fifths as important as total adverse selection.

Adverse selection and adverse retention will vary in importance from group to group. While data for other groups are scarce, we suspect that the degree of adverse selection and retention will depend on three factors: the provisions and management ability of the different plans, the heterogeneity of the population, and the length of time for which the plans have been offered. The last aspect is particularly important if people do not switch plans frequently; adverse retention will drive up the costs of older plans relative to younger plans.

Biased enrollments in GIC plans have proved consequential. In most recent years, the indemnity plan has increased in cost relative to the HMO's and has lost enrollment. The GIC is required to offer an indemnity plan and, therefore, to fight the forces of adverse selection and retention.⁷ The GIC's primary strategy has been to cross-subsidize the indemnity plan, by paying 85 percent of plan premiums. Thus, individuals can join the indemnity plan by paying only 15 percent of the cost differential.⁸ The

⁶ This calculation differs from Table 1 because it is for stayers only, while Table 1 is for all enrollees.

⁷ It is widely believed that most state legislators (who have required the indemnity plan to be continued) are in the indemnity plan and thus would be concerned about its survival and its rate.

⁸ Many other employers have a policy of paying a fixed amount for health insurance, independent of the plan chosen. If employees had to pay the full incremental cost of the indemnity plan, adverse selection would be more severe (Roger Feldman et al., 1989; Cutler and Sarah Reber, 1998).

GIC has also actively managed the costs of the indemnity plan, including “carving out” mental-health benefits and prescription-drug benefits to lower-cost providers; bargaining with hospitals over laboratory and other ancillary services; and actively managing care for high-cost outpatient users.

Efficiency demands that the GIC, and more generally employers offering health plans, should charge insureds amounts intended to reflect true cost differentials across plans. Moreover, many would say equity is also served if those who want more services are required to pay for them. The GIC approach of neglecting risk mix and subsidizing cost differentials heavily employs two counterbalancing wrongs, which only miraculously could come out right. It also provides few incentives for plans to compete vigorously on the basis of price, since employees realize only 15 percent of the gains of any price reduction.

Economists typically prescribe implementing “risk adjustment” in such situations. This would involve a greater employer contribution per capita for plans that enroll more high-risk people and less to plans that enroll more low-risk people. If payments from the GIC were calibrated to offset risk differences, employees seeking higher-service plans would then be charged amounts reflecting only the management differences across plans for a standardized population mix. Risk adjustment can be prospective (e.g., paying more to plans with more heart-attack survivors), retrospective (e.g., subsidizing high-expense cases through a reinsurance system), or a mixture of the two. Risk adjustment is just beginning to be recognized, and its methods implemented. Designing and testing alternative risk-adjustment systems will be critical if we are to encourage choice and competition in health insurance.

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