PATIENT SELECTION IN A COMPETITIVE HEALTH CARE SYSTEM

by Harold S. Luft and Robert H. Miller

Prologue: During the 1980s, as alternative medical care delivery systems have proliferated and nonprofit and commercial health insurance carriers have competed to remain viable enterprises, the insurance market has splintered into an array of new choices. As this more competitive environment has evolved, one increasingly important development in the health policy realm is how insurers select patients. Patients deemed high medical risks obviously cost considerably more than patients with fewer maladies. Within this context, it has become clear that as health insurers grow ever less willing to cross-subsidize hospital expenditures that are not otherwise covered—that is, indigent care and graduate medical education expenses—patient selection becomes a paramount concern of provider and payer alike. In this article, Harold Luft and Robert Miller examine the multitude of issues that arise around the subject of patient selection. Luft holds a doctorate in economics from Harvard University and also took a postdoctoral fellowship at Harvard’s Center for Community Health and Medical Care. He is a professor of health economics at the University of California, San Francisco (UCSF), and associate director of the Institute for Health Policy Studies there. Luft has built a national reputation as a brilliant analyst of complicated public policy issues, not the least of which is the question of patient selection. Luft asserts that biased patient selection exists; few people doubt that conclusion. The policy challenge, he concludes, is for third-party payers to craft adjustments in their payments to compensate for unequal risks. Robert Miller holds a doctorate in economics from the University of Michigan. He currently is taking a two-year postdoctoral fellowship at UCSF under the sponsorship of the Pew Charitable Trusts. Among the major research pursuits of Miller, who is a Canadian, are the examination of long-term care issues—particularly comparing these issues as they are being addressed in the United States and Canada—and patient selection questions, a very important subject in the context of long-term care.
Medical care in the United States has become more competitive in many areas. Providers are increasingly competing for patients; third-party payers are negotiating with providers for better rates; and competition among third-party payers has increased markedly. This article will explore some of the issues associated with increased competition among these third parties in how they deal with each other and their clients. In particular, while third-party payers may compete by designing more efficient methods of delivering medical care, it is far easier to attempt to attract enrollees whose need for medical care is less than average, while quoting a premium only slightly below average. This type of competition through biased selection has two deleterious consequences: it diverts energy away from the design of more efficient systems, and it undercuts support for a diversity among plans.

The first section of the article will outline some of the changes in the market for third-party coverage that give rise to more concern about problems of biased selection and the setting of premiums. The second section briefly reviews empirical studies on the presence of biased selection. The third section outlines a series of methods to deal with selection bias problems. The final section outlines some of the policy considerations associated with the various options.

Selection And Health Insurance Markets

Health insurance plans, whether they are health maintenance organizations (HMOs), conventional health insurers, or hybrids such as preferred provider organizations (PPOs), undertake to provide or pay for the medical care of their enrollees. Favorable selection occurs when a plan has an enrollee pool whose health care needs are less than anticipated when the premium was set. Adverse selection refers to the opposite situation, that is, when the enrollee pool requires more than the anticipated amount of health care.

The “anticipated amount of care” for a given population incorporates certain assumptions about the delivery system and economic incentives in the plan. Since selection bias is related to what was expected given the type of coverage and delivery system, it is often quite difficult to identify. The observation that medical care costs are, say, 20 percent lower among people in an HMO relative to those in a fee-for-service plan is consistent with favorable selection into the HMO, greater efficiency on the part of the HMO, or both. The HMO could even be experiencing adverse selection if it anticipated efficiency savings of greater than 20 percent.

Encouraging biased selection. The medical needs of enrollees in a particular group may vary. However, with large enough groups, this type of random variation matters little, and one must be concerned about
consistent biases. A number of factors may encourage biased selection among enrollees.

Differences among HMOs may lead to biased selection. For example, a plan that uses well-respected local tertiary referral hospitals may attract higher-risk people than a plan that relies primarily on local community hospitals. The location of clinic sites in lower- or middle-income areas also may influence enrollment. One of the most important differences is seen in the structure of prepaid group practices versus individual practice associations (IPAs) involving a large fraction of the local physicians. For most people initially in a fee-for-service plan, enrollment in a prepaid group practice entails forging a new doctor-patient relationship. This is a major impediment to joining an HMO. Thus, people who do join are likely to be new in the area or minimal users of medical care who have not established an ongoing doctor-patient relationship.

Marketing strategies can influence the mix of enrollees; plans emphasizing complete drug coverage will attract a different group of enrollees than those emphasizing their sports medicine clinics, for example. Some HMOs serving the Medicare market have attempted to attract seniors by sponsoring get-acquainted coffees or by making presentations at community events. Such approaches are far more likely to reach the active, healthy population than the homebound. Direct marketing by telephone or mail generally is avoided unless it includes a request to “see the facility and pick up an application form.”

The design of benefit packages also can affect selection. Extensive well-baby coverage is attractive for young families yet of little importance for older adults. If seniors with their teeth intact are generally healthier than those with dentures, a Medicare supplemental plan with dental benefits may attract relatively low-risk enrollees.

A very small proportion of any enrollee group accounts for a large fraction of total expenditures. Thus, a plan can ensure favorable selection by encouraging those few high-cost enrollees to disenroll. For example, the appropriate specialists could be somewhat curt or gruff. Alternatively, physicians may advise disenrollment in what is (or appears to be) the patient’s interest: “We can treat your problem, but the Mayo Clinic has the world’s expert in a new type of therapy. This HMO doesn’t cover treatment there, but if you were to switch back to the fee-for-service plan . . . .” Occasional selective disenrollment is almost impossible to detect because a few high-cost people can have an enormous impact on cost.

Markets For Health Insurance

There are four major markets for health insurance in the United
States: group coverage through employers or unions, Medicare coverage for the elderly, Medicaid coverage for low-income persons, and individual coverage. Selection issues are quite different in each of these markets.

**Group coverage.** Group coverage through employer- or union-sponsored plans traditionally has had two major advantages, aside from the tax subsidy. By enrolling a large number of persons, group plans reduce substantially the administrative costs associated with individual billing, especially when payroll deductions are used to collect any employee share. More importantly, if all the employees in a given site are enrolled, the chances for adverse selection are minimized. In the past, health insurers would compete in this market largely on the basis of their efficiency in the processing of claims, since all carriers could offer the same mix of coinsurance and deductibles and none had effective controls over providers’ behavior. Employers typically would offer only a single insurance plan, since there would be nothing to gain from the provision of a choice and much to lose through higher quoted premiums as each carrier would be afraid of adverse selection.

The growth of HMOs has led to substantial changes in the market for group coverage. HMOs offer a significantly different type of product, typically with more comprehensive benefits and less reliance on financial barriers to patient access but more limited choice of providers. In contrast to the several brands of vanilla offered by conventional insurers, HMOs promise a wide variety of flavors, supporting the argument that employers should offer choices among a set of plans. The federal HMO Act of 1973 allowed HMOs meeting certain federal qualifications to approach employers and demand that they be offered as long as no similar plan already was in place. Since HMOs often are available only in certain geographic areas, some national employers now offer over a hundred different HMOs and one conventional fee-for-service plan.

The differences in the ways premiums are set in the various plans further complicates the situation. Most large employer and union groups either self-insure or have experience-rated conventional insurance plans. This means that premiums essentially reflect the costs incurred by those enrolled in that plan. Most HMOs traditionally have used community rating, whereby premiums are based on the costs incurred by all HMO members, not just those enrolled from a particular company. In general, even a large employer accounts for only a small portion of any HMO’s total enrollment. Thus, if an HMO experiences favorable selection within a given employee group, its premium is unlikely to change much (even if the premium was set fairly and the plan was not pocketing the savings due to selection), while the full force of the adverse selection experienced by
the conventional plan would affect its premiums.

In many instances, the problem is compounded when the employer bases its contribution on the cost of the fee-for-service option. Federal regulations have required that the contribution to the HMOs be no less than that offered the conventional insurance plan. If HMOs attract the low-risk people, this increases the fee-for-service plan cost, which then increases the employer contribution. Since this scenario presupposes a rapidly rising conventional insurance premium, due in part to adverse selection, and a more stable HMO premium, the rising contribution increases the relative attractiveness of the HMO by lowering its net price. In some instances, the net enrollee cost for the HMO may fall to zero, thereby encouraging people to enroll even though they are covered through a spouse. This duplicate coverage is an extreme form of favorable selection because even though the premium is paid, the enrollee has little intention of ever using the plan.

**Medicare.** In some ways the Medicare market is similar to that of the group enrollment market, yet in other ways it differs significantly. The availability of HMOs varies by geographic area, yet there is a single “fee-for-service plan.” On the other hand, Medicare does not pay the HMO’s community-rated premium. Instead, it offers plans a premium based on 95 percent of the adjusted average per capita cost (AAPCC) for fee-for-service beneficiaries in the local area. The AAPCC is designed to offset selection differences in terms of age, sex, welfare status, and institutional status; thus it is far more sophisticated than approaches commonly used by employers. Tying the payment to local costs means that if selection occurs in an area, it has a much more substantial effect on premiums than if averaged over all fee-for-service beneficiaries in the nation. In contrast to employer-sponsored plans, which typically have a single open enrollment season each year during which people can switch plans, Medicare has only a one-month lock-in. While marketing in employee groups typically is through flyers reviewed by the benefits department, Medicare markets directly to the consumer. These factors enhance the likelihood of selection favorable to the HMO.

While most of the above differences are due to regulations and historical practice, two remaining factors are inherent in the different populations being covered. First, by definition, Medicare beneficiaries are substantially older than the average employed population. This implies greater need for medical care, so that the “stakes” associated with selection bias are greater. More importantly, medical need has both acute and chronic components. The former is much more likely to be associated with random events, less subject to selection bias. The aged probably have a greater ratio of chronic to acute use, thereby making them a more
fertile ground for selection strategies. Second, enrollment is almost always by family unit, and the units are typically smaller for Medicare beneficiaries (self or self and spouse) than for employees who often cover a spouse and children. The larger the family unit, the greater the internal risk pooling.

**Medicaid.** The Medicaid market is conditioned by its focus on the poor. Copayments, deductibles, and extra premiums are impossible with such populations, so many standard economic incentives cannot be used. Some states allow Medicaid eligibles to choose either the fee-for-service system or an HMO, while others force a choice among several HMOs. Plans serving Medicaid populations often effectively restrict themselves to low-income populations because of geographic constraints. Finally, many Medicaid programs pay their fee-for-service providers below market rates, so premiums tied to those costs may be unattractive to many HMOs.

**Individual coverage.** Insurance companies have always been most concerned about adverse selection (often termed antislection) in the market for individual coverage because the prospective enrollee is likely to know far more about his or her health than the insurer is. Therefore, carriers often restrict enrollment, require medical exams, or exclude coverage for preexisting conditions. This market does not seem to have changed substantially in the past several decades, although the spread of acquired immunodeficiency syndrome (AIDS) raises an obvious threat from the perspective of the carriers.

### Identifying Biased Selection

As mentioned above, it is difficult to identify biased selection because we can never observe what the health care use or cost for an individual would have been had that person stayed in a fee-for-service insurance plan rather than joining an HMO. Evaluation by means of an elaborate, and probably somewhat coercive, randomized trial might provide us with estimates of this information for one or several small geographic locations, but the political and economic cost of such an experiment would be prohibitively high, and the generalizability of results would be limited.

The literature identifies biased selection in several ways, none of which are perfect. Many studies compare prior utilization or cost of the new HMO enrollees and those remaining in the fee-for-service system. Basing comparisons on these prior use and cost measures has several drawbacks. First, measures of prior utilization and cost vary among studies. Second, as we explain below, one obvious problem in making comparisons among studies is that researchers make almost as many different adjustments to
these measures as there are studies. Third, prior utilization and cost predict only imperfectly future utilization and cost. These measures only partially represent need, which is a key, but not exclusive, factor in determining future demand for medical care services. Fourth, Welch argues that group differences in prior health care use and cost measures may be subject to “regression to the mean,” which would greatly weaken the extent of selection bias they indicate. Finally, prior use and cost measures also may incorporate health care needs voluntarily “stored up” for a limited period of time in anticipation of joining a new plan, or involuntarily “stored up” due to difficulty in obtaining access to the type and quality of care desired in a timely fashion.

Some studies of new enrollees also examine health status indicators as selection bias measures. However, health status measures vary more among studies than do utilization and cost measures. Moreover, health status measures predict subsequent use and cost even less well than do prior use or cost measures.

While many studies use demographic variables such as age, gender, and marital status as indicators of selection, we chose not to consider demographic variables because their interpretations are ambiguous. For example, a younger group of enrollees can expect lower, the same, or higher costs than an older enrollee group, depending upon factors in addition to age, including the number of enrollees who expect to bear children, and the number and age of children that enrollees already have.

Other studies examine prior use, cost, and health status measures to determine selection bias in disenrollment. Many of the problems affecting determination of selection bias in studies of enrollment also are encountered in studies examining disenrollment.

The literature is limited in comparisons of selection bias measures of existing enrollees in HMO and fee-for-service groups. Selection studies do not compare directly health care use and cost differences of people already enrolled in two different plans, since use and cost differences are affected by both selection bias and “system factors” (differing levels of efficiency, service price, and quality/type of health care product). Some studies examine health status measures or demographic measures, both of which are subject to the above problems. In addition, health status measures also may be affected by the quality and type of health care provided by each type of plan.

Identification of selection bias also is made difficult because the method of adjustment of selection bias measures affects our interpretation of the results. Different methods of adjusting a selection bias measure within a study can lead to different results for the same measure within that study. For example, Eggers and Prihoda present selection bias
results from a study of three Medicare demonstration sites, including the Greater Marshfield Community Health Plan, an IPA HMO. At Marshfield, total Medicare reimbursements for the four years prior to the point of enrollment were 14 percent lower for HMO joiners than for non-HMO enrollees. This unadjusted, prior cost result is statistically significant and is favorable to Marshfield. However, Marshfield received an AAPCC-adjusted payment from Medicare, where the AAPCC adjusts for age, sex, race, institutional status, and disability status. This second measure of selection bias is neutral to the HMO (prior reimbursements for HMO joiners, after adjusting for AAPCC factors, were 4 percent greater than for non-HMO enrollees, and the difference was not statistically significant). Clearly the method of adjusting a selection bias measure within a study is critical in determining whether adverse, neutral, or favorable selection took place.

Different methods of adjusting a selection bias measure among studies also can lead to different results for the same measure among those studies, further complicating identification of selection bias. For example, some studies report only unadjusted prior use and cost measures, while others report prior use and cost measures whose adjustment went well beyond that of the AAPCC. The reader should keep in mind that for two studies with the same measure but two different methods of adjusting the measure, applying the method of adjustment in the second study to the data in the first study could produce a very different selection bias result than reported for the first study. This (among other factors) seriously qualifies any interpretation of the results considered below.

Evidence Of Selection Bias From The Literature

Here we briefly summarize evidence of selection bias in HMOs compared to fee-for-service plans, focusing on existing selection bias measures of health care use, cost, and health status. We examine three sets of studies, which compare these characteristics of HMO and non-HMO enrollees at three stages of enrollment: (1) new HMO enrollees versus fee-for-service stayers; (2) existing HMO enrollees versus non-HMO enrollees; and (3) HMO disenrollees versus non-HMO enrollees, HMO enrollees who stayed in the HMO, or HMO enrollees prior to enrollment.

Method of summarizing selection bias results. We chose studies published after 1974 to focus on more recent market data, which spanned 1972-1984. The results of each study appeared either in journals or in Advances in Health Economics and Health Services Research.

We divided selection bias measures into three categories: health care service utilization, health care cost, and health status. Several possible
individual measures for each category exist for most findings. Thus, we counted the number of statistically significant summary measures in each category to derive the selection bias result for that category. For example, if a study presented preenrollment results for hospital admission rates, percentage of enrollees using the hospital, average length-of-stay per admission, number of hospital days per thousand enrollees, and number of physician visits per thousand enrollees, we chose the number of hospital days and physician visits per thousand as the key statistics. If both statistics were significantly lower for the group that chose the HMO, we determined that the HMO experienced favorable selection. If both statistics were statistically insignificant or if both were significant and had opposite signs, we determined that the HMO experienced neutral selection. Some of the measures of selection were means of use, cost, and health status variables, unadjusted or adjusted for various characteristics of joiners and stayers. Other measures of selection were coefficients of use, cost, and health status variables used in choice equations predicting the likelihood of joining, or not joining, an HMO.

A study was treated as having two observations or findings if it: (1) examined two separate sites; (2) compared characteristics of people enrolling in a fee-for-service plan to people enrolling in a prepaid group practice and (separately) in an IPA; (3) used two different methods of analysis that produced distinctly different results; or (4) examined the characteristics of people in two different population samples and the analysis produced different results for each group. Almost all studies provided one or two observations.

Some caveats. Findings in the existing literature have limited generalizability. Researchers examined a nonrandom, heterogeneous sample of plans and studied certain plans or markets several times but did not study (or report on) other important plans or markets. HMO characteristics varied greatly according to the newness of the HMO, how long the plan had been offered to the group, its market penetration, and the extent of competition from other HMOs and traditional insurance plans. Of course, HMO premiums and coverage relative to conventional insurance plans or other types of HMOs also varied widely. Some HMOs served employment-based groups, others served Medicare and Medicaid. The plans studied did not systematically represent all these variations. Moreover, there are not large numbers of observations on any of the selection measure categories examined here. For persons at the point of enrollment in HMOs, there are only twenty-two observations on prior health care use, eighteen observations on prior cost, and thirteen observations on health status. For disenrollment, we have only ten use-related selection bias observations, four cost-related observations, and two observations.
on health status.

While not a general problem, some of the sample sizes were small, which biased results towards neutral selection findings. On the other hand, a couple of studies did not subject results to significance tests, which biased results toward the impression of either positive or negative findings. There was also a possible publication bias, since some studies with neutral results probably did not get published. Moreover, since almost all study data end no later than 1982, we do not know if changes in the health insurance plan market over the past five years have had an impact on the recent pattern of selection bias in the choice of health plan. At the same time, it is also important not to overstate these caveats, since the existing literature does present some distinct patterns in results on selection bias in health plans.

**New enrollees.** Exhibit 1 provides an overview of the results for the first set of studies, which examine characteristics of health plan enrollees at the point of joining, or not joining, an HMO. The results show that, in most cases, new HMO enrollees either have lower, or the same, prior health care service use and cost as do non-HMO enrollees.

While these results tend to indicate that HMOs have generally favorable selection of new enrollees (based on use and cost measures), the results are not lopsidedly favorable to HMOs: fourteen of twenty-two observations on prior use and eight of eighteen observations on prior cost show either no difference in enrollee use and cost characteristics compared to non-HMO plan enrollees, or (in four cases) they show differences unfavorable to HMOs. Moreover, the favorable selection results may be overstated if future new HMO enrollees “store up” health care utilization until they switch plans.

HMOs may enroll persons of roughly similar or even slightly worse health status on average than conventional insurance plans, but HMOs may enroll few, or fewer, of the small group of very sick people who dominate both the use and cost statistics. This is suggested by the fact that of the thirteen observations with health status findings for persons at

### Exhibit 1
Selection Bias Results For All HMO Types, New HMO Enrollees Versus Non-HMO Enrollees

<table>
<thead>
<tr>
<th>HMO type</th>
<th>Prior use</th>
<th>Prior cost</th>
<th>Health status</th>
</tr>
</thead>
<tbody>
<tr>
<td>All types</td>
<td>8</td>
<td>11</td>
<td>3</td>
</tr>
</tbody>
</table>

Note: Fav.=favorable; Neu.=neutral; Unfav.=unfavorable to the HMO.
the point of enrollment, only one found selection favorable to HMOs while eight observations were found neutral to HMOs. This contrast of health status to prior use and cost results may reflect, however, the small number of observations or studies.

In Exhibit 2, we again look at selection studies at the point of enrollment, but divide up observations according to type of HMO plan. While the observations per plan type are few, it still seems that different plan types attract new enrollees with different characteristics. The observations on prior use and cost for prepaid group practices clearly show selection favorable to them, while observations on IPAs and the “don’t know/both” category were less clearly favorable. In fact, for prior use in Exhibit 1, the overall selection results are somewhat favorable to HMOs due to the favorable results for the known prepaid group practices.

For people initially in a traditional health insurance plan, joining a prepaid group practice means establishing a new patient-physician relationship, whereas joining an IPA often means continuing an existing relationship. Hence, people satisfied with an existing patient-physician relationship will be more likely to leave the fee-for-service plans if an IPA plan is offered than if a prepaid group practice plan is available. To the extent that having an existing patient-physician relationship is correlated with a generally higher health care use, which necessitates that relationship, IPAs could experience unfavorable selection relative to prepaid group practices. One study that examined the choice between a fee-for-service plan, an IPA plan, and prepaid group practice plans showed that among those families who chose the fee-for-service or IPA plans, a much higher percentage reported that a private physician was their previous source of care, compared to the prepaid group practice plans. At the same time, between the fee-for-service plan and the IPA, there was no difference in the percentage of enrollees reporting previous source of care. The prepaid group practice enrollees had lower hospital and ambulatory care use and costs than either the fee-for-service or the IPA plan.

Exhibit 2
Selection Bias Results For Different HMO Types, New HMO Enrollees Versus Non-HMO Enrollees

<table>
<thead>
<tr>
<th>HMO type</th>
<th>Number of selection bias observations</th>
<th>Prior use</th>
<th>Prior cost</th>
<th>Health status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepaid group practice</td>
<td>5</td>
<td>3</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>IPA</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Don’t know/both</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: Fav.=favorable; Neu.=neutral; Unfav.=unfavorable to the HMO.
Exhibit 3
Selection Bias Results For Medicare And Non-Medicare HMO Plans, New HMO Enrollees Versus Non-HMO Enrollees

<table>
<thead>
<tr>
<th>HMO type</th>
<th>Prior use</th>
<th>Prior cost</th>
<th>Health status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicare</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Medicare</td>
<td>7</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Fav.=favorable; Neu.=neutral; Unfav.=unfavorable to the HMO.

In Exhibit 3, we divide up selection bias results at the point of enrollment again, this time according to whether the plan was a Medicare demonstration or not. Three of the four Medicare sites examined showed prior cost selection favorable to the HMOs, without or with an AAPCC adjustment. The fourth site showed favorable cost results to the HMO unadjusted for the AAPCC and neutral results after the AAPCC adjustment (Marshfield). The first three sites were prepaid group practices, while the latter site was an IPA. Potential reasons for the generally favorable selection for HMOs have already been mentioned earlier. Note that if we eliminate the Medicare studies from the prior cost study totals in Exhibit 1, we reduce the preponderance of cost results favorable to HMOs, but the general pattern remains.

Existing enrollees. Exhibit 4 summarizes studies examining the health status of persons already enrolled in HMOs compared to those not enrolled in HMOs. For the already-enrolled population, results are generally favorable to HMOs. For all types of HMOs combined, eight observations on health status show selection favorable to HMOs, seven show neutral selection, and one shows unfavorable HMO selection. To the extent that better health is correlated with lower health care expenditures, these results are consistent with the results showing favorable selection according to use and cost measures at the point of enrollment.

Exhibit 4
Health Status Selection Bias Results For Different HMO Types, Already-Existing HMO Members Versus Non-HMO Enrollees

<table>
<thead>
<tr>
<th>HMO type</th>
<th>Favorable</th>
<th>Neutral</th>
<th>Unfavorable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepaid group practice</td>
<td>5</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>IPA</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Don’t know/both</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
<td>7</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: These results are favorable, neutral, or unfavorable to the HMO.
Note the pattern of health status results for the already enrolled shows more favorable selection for HMOs than the pattern of results for the newly enrolled. While this may reflect selective disenrollment from the HMO of the sickest members, it also could reflect actual or perceived benefits of an increased focus on prevention.

Disenrollees. Studies of disenrollement are important in determining selection bias in HMOs, since annual disenrollment rates can reach 20 percent or higher. While often much of this is due to loss of eligibility, if disenrollment is selective, it may have important cost consequences. Exhibit 5 summarizes results from studies of disenrollment. We need to distinguish between three types of disenrollment findings whose differences are characterized by intergroup comparisons.

The first type of finding compares HMO disenrollees and HMO enrollees that stay. Here the comparison is between use and/or health status of HMO disenrollees prior to leaving (or, for health status, right after leaving) the HMO compared to use and/or health status of HMO enrollees that stay. In general, the use and health results show unfavorable selection for HMOs for any category of disenrollee examined—all disenrollees combined, voluntary disenrollees, and involuntary disenrollees. That is, use by HMO disenrollees prior to disenrollment was lower than use by HMO enrollees who elected to stay in the HMO for seven of eight observations, from seven studies.

The second type of finding compares HMO disenrollees after disenrollment and fee-for-service enrollees. Unfortunately, only two studies have made this comparison, for two disparate groups: voluntary Medicaid disenrollees and both types of disenrollees (voluntary and involuntary) from HMO plans sponsored by an employer. Four of five use and cost observations showed favorable disenrollment selection for HMOs according to this comparison. That is, in comparison to fee-for-service enrollees, HMO disenrollees after disenrollment had either higher health care use or higher health care costs in a period after disenrollment.

### Exhibit 5
Selection Bias Results For Different HMO Types, Disenrollment Observations

<table>
<thead>
<tr>
<th>HMO type</th>
<th>Number of selection bias observations</th>
<th>Use</th>
<th>cost</th>
<th>Health status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepaid group practice</td>
<td></td>
<td>1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>IPA</td>
<td></td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Don’t know/both</td>
<td></td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>2</td>
<td>1</td>
<td>7</td>
</tr>
</tbody>
</table>

Note: Fav.=favorable; Neu.=neutral; Unfav.=unfavorable to the HMO.
The third type of finding compares HMO members following disenrollment and HMO members prior to enrollment. Only one study made this particular comparison, for cost only. Evidence of favorable disenrollment selection for HMOs was found.17

It is interesting that opposite disenrollment selection results, while possibly the result of chance, were derived using the first and the last two methods of comparison. If these contradictory findings have any significance, it may be that at least some of the people who voluntarily disenroll “store up” or postpone health care utilization when in the HMO only to use a greater amount of health care than fee-for-service enrollees in the period immediately following disenrollment from the HMO. If some disenrollees, including high-cost disenrollees, temporarily depress their expenditures prior to disenrollment while HMO “stayers” do not, then comparing expenditures before disenrollment may overstate significantly the degree of unfavorable disenrollment selection by the HMO. While some people may voluntarily defer utilization until leaving, others may find that their utilization is deferred involuntarily over time in cases where they cannot get timely access to the type, quantity, or quality of care that they desire. At some point, they may leave the HMO. Alternatively, voluntary disenrollees may be low users until they need important health care services, at which point they may disenroll and reestablish their prior patient-physician relationship.18 What would look like unfavorable disenrollment to the HMO also would look like unfavorable enrollment to the fee-for-service plan. These hypothesized patterns of cost would not be true for involuntary HMO disenrollees, who are included with voluntary disenrollees in the study by Buchanan and Cretin.

Summary of the empirical evidence on selection bias. The evidence from the literature suggests that HMOs are subject to some favorable selection of new enrollees according to prior health care use and cost measures, although no selection bias at all is also a common result in many studies. The prepaid group practice model and the Medicare demonstrations account for much of the favorable selection findings according to these measures. No such favorable selection exists according to health status measures: it is possible that health status of new enrollees is similar to enrollees in fee-for-service plans, but that fewer persons with very high health care costs enroll in HMO’s, lowering the average pre-HMO enrollment use and cost statistics.

Health status for people already enrolled is also generally favorable to HMOs. The preponderance of evidence from disenrollment studies suggests HMOs are subject to unfavorable disenrollment. However, both favorable HMO enrollment and unfavorable HMO disenrollment may
be overstated, if members “store up” health care utilization prior to enrolling in, or disenrolling from, an HMO. Further empirical research is needed to establish definitively the extent of overall selection bias; studies that follow cohorts of people longitudinally through HMO preenrollment, enrollment, and postenrollment would be particularly useful.

### Strategies To Address The Problem Of Biased Selection

It is clear that people with different characteristics enroll in different plans, stay in different plans, and disenroll from different plans. Selection bias exists. The key policy question is, “What are the most effective ways to compensate for this biased selection?” In this section, we discuss a range of changes in the way premiums are determined, along with our evaluation of their desirability. In particular, we are concerned about some approaches that may appear to be arbitrary. In such instances, HMOs that truly are more efficient providers may decide that certain markets are not worth entering because of the substantial investment that could be threatened by unilateral changes in the rules by a payer. Ironically, since strategies to induce favorable selection may be far less expensive than designing efficient plans, this may leave the market to only the least desirable plans. In more extreme situations, the fear of biased selection may even lead to the exclusion of all types of alternative delivery systems—throwing out the baby with the bath water. Thus, it may be useful to explore some approaches to deal with biased selection.

It is helpful to distinguish two broad categories of suggestions addressing the problem of biased selection. The first focuses on adjustments to premiums to reflect risk differences better and to reduce the impact of selection bias. The second category of suggestions focuses more on the processes by which premiums are set.

**Risk adjustments.** As mentioned above, there are some important differences in the calculation of HMO premiums in the private and Medicare markets. Medicare payments already include adjustments for age, sex, location, welfare, and institutional status. It is important to note that the Medicare adjustments via the AAPCC implicitly refer to the government’s contribution since Medicare beneficiaries cannot be charged by HMOs for the basic Medicare package. In the typical employer situation, one must distinguish the premium charged by the plan from the contribution the employer is willing to make. The difference between the premium and contribution is the employee’s net cost. Most employers differentiate contributions only by family structure, such as employee, employee plus one dependent, or family. Some HMOs use what is termed community rating by class to adjust their premiums up or
down reflecting enrollment patterns from an employer that differs from the HMO’s overall pattern of enrollment.

The HMO can adjust its premiums based on known patterns of use by its enrollees across risk categories, but the employer does not know what the expenditures would have been for those people in some standardized plan. For example, the conventional fee-for-service plan may identify young children as relatively inexpensive to cover, while the HMO sees them as relatively expensive because of their well-baby visits and immunizations, which often are excluded from coverage, and occasional ambulatory care use, which often is absorbed in the fee-for-service deductible. Nonetheless, it would appear to be desirable to include some empirically based adjustments to both premiums and contributions if risk factors can be identified to offset selection bias.

It is important to note that the intent of such a proposal is to pay plans more if they have higher-risk enrollees and less if they have lower-risk enrollees. At the same time, enrollees should not have to bear the burden of the extra cost associated with their risk factors. This is a value judgment with which some people might disagree. Moreover, it is less clear whether risk factors associated with changeable behaviors should be fully offset. For example, plans may wish to charge higher premiums for smokers, but sponsors such as employers and HCFA may not wish to offset those differential charges. If individuals had the option to move back to lower premiums the next year by giving up smoking, such an approach might be more acceptable.

Risk factor differentials should be based upon variables that are clearly related to differences in medical need, are easily determined, and not subject to gaming. A smoking differential is difficult to determine, and people would have strong incentives to claim they had quit. On the other hand, age, sex, location, and similar variables may not be too difficult to obtain. (It is important to note, however, that employers typically have such information for employees, but not for family members. HMOs typically have this data, but conventional carriers only acquire it as covered enrollees use enough medical care to file a claim.)

The experience of Medicare with its AAPCC suggests that further modifications to its risk factors may be in order. Among those suggested are eligibility for Medicare through the disability program, rather than just though reaching the age of sixty-five. A better measure of institutional status, that is, one that measured eligibility for nursing home placement rather than actual institutionalization, also might help. Similarly, adjustments for the varying benefits offered by state Medicaid programs might improve the predictive value of this variable. Clearly, not many of these variables would be much use for employed popula-
tions. Instead, one might explore variables such as extensive sick leave, job classification, and spouse’s coverage under another health plan.

The review of the evidence on selection in the preceding section suggests that the classic sociodemographic factors are less likely to show selection than are measures of medical care utilization and, to an even greater extent, expenditure. This supports the notion that, because a relatively small proportion of any population accounts for a large fraction of utilization and expenditures, risk factors are very blunt tools with which to measure selection bias. Consequently, they will not be able to adjust fully for biased selection. Therefore, various investigators have suggested using health status or prior use variables to adjust payments.

Health status measures, especially those related to chronic illnesses, are important predictors of future medical care use. Others have shown that functional status, such as the instrumental activities of daily living (for example, can a person walk up and down stairs without help?), are helpful in predicting subsequent utilization. While these enhancements have been suggested primarily for Medicare, they also may be relevant to the employed population. For example, some chronic illnesses, such as severe allergies, diabetes, and mental illness, may be particularly subject to biased selection because of coverage differentials.

The major problem with health and functional status measures is the difficulty in obtaining reliable and valid data while minimizing gaming. The problems of dissembling are especially severe if enrollees’ responses are used to determine individual “vouchers” and premiums. If medical records are used, then differences in diagnosis can have important payment impacts, similar to “DRG creep.” Some of the administrative and dissembling problems might be alleviated if random samples of enrollees were used and if the individual’s responses affected only group rates. An extreme form of health status adjustment is based on the well-known concentration of medical care expenditures in the last year of life. Plans with a higher proportion of deaths will tend to incur more expenses. However, it would be quite unseemly to appear to reward a plan for a higher mortality rate.

Since much of the evidence supporting the notion of biased selection uses prior utilization among people who subsequently change plans, prior use is a natural candidate as an adjuster. While there is a substantial component of regression to the mean, whereby people with high use in one year tend to have lower use in subsequent years, even after six years high users have not returned to the average level. Some of the more sophisticated versions of this approach distinguish chronic from acute use and take account of the potential for physicians’ discretion in deciding to hospitalize a patient. Ash and colleagues identify diagnostic cost
categories for the allocation of prior use and set specific prospective payment levels for each category.24 Such approaches have the difficulty of data availability for people not in a system that routinely captures hospitalization information in the preceding year. HMOs also complain, justifiably, that if they are successful in preventing hospital admissions by improving health or substituting outpatient care, they are penalized by such adjustments.

The various prior use models are based implicitly on the notion that enrollee populations are stable from one year to another and that prior use can therefore be used to predict subsequent need. For small enrollee groups, however, such an approach may either over- or underpay the plan. A few very high-cost enrollees in one year will boost subsequent payments even if those individuals die or transfer out in the future. Therefore, other models seek a blend of capitation and “fee-for-service” payments. This can be done by establishing reinsurance pools for HMOs whereby they can be reimbursed if expenditures for either a group or individual exceed certain limits. Newhouse argues for an explicit blend between pure capitation and pure fee-for-service reimbursement.25 Another version would identify particular high-cost diagnoses (ideally those not very subject to physician discretion) and pay the HMO a diagnosis-related group (DRG) type payment based on the average cost of such cases, not what they actually spent.

**Rules of the game.** While some analysts have focused their attention on adjustments to the premiums (and implicitly the contributions) to account for differences in risk across plans, others have focused on the “rules of the game” or the methods of determining premiums. Some of these suggestions are designed to reduce the opportunities for biased selection, and others reduce the benefits of favorable selection.

It appears that biased disenrollment may be a far more important problem than biased enrollment if plans selectively encourage the small number of very high-cost members to leave. It is almost impossible to identify such behavior from routinely collected statistics because there is always a relatively large number of people disenrolling for other reasons. Since such efforts may be highly profitable, it is important to develop methods to counter such behavior. This problem may be particularly severe in Medicare because beneficiaries can opt out of an HMO at any time and return to the standard fee-for-service system. Thus, it is easy to encourage someone to leave when they have an “expensive” problem.

One simple proposal to reduce the impact of selective disenrollment in Medicare is a twelve-month lock-in, such as is the case in most employer-sponsored plans. (Even with such a lock-in, most employers will allow a switch of plans upon special appeal.) The advantage of a lock-in is that, in
most instances, the plan will be responsible for the patient for at least a few months. This is enough time so that much of the expensive treatment might be incurred and the patient also may become more comfortable with the available providers and be less inclined to switch out. Such a lock-in, however, may be politically unacceptable for Medicare.

An alternative to a one-year lock-in would allow disenrollment at the end of the month, as is currently the case, but the HMO would continue to receive the standard capitation payments from HCFA for another twelve months and be required to reimburse HCFA for its outlays under the fee-for-service program for that patient. The intent here is to allow patient choice but to remove the incentives to disenroll high-cost people. If disenrollees are merely average users, there is no net loss. If potential disenrollees are very high users, the HMO might even try to keep them to provide more cost-effective treatment than offered by fee-for-service Medicare. Small HMOs probably would prefer to purchase a reinsurance policy to “settle up” with HCFA under such a system. Their reinsurance premiums will reflect the differential risk of disenrollees relative to their AAPCC. The carrier offering such a policy would have strong incentives to monitor the disenrollments from each of the HMOs buying a reinsurance policy to determine if some plans are dumping patients.

A quite different problem often arises from the influence of biased selection on the level of the contribution. Favorable selection results in overpayment even if the payment is according to some clear, external standards. However, in many instances, the sponsor’s contribution is tied to the fee-for-service level. Substantial biased selection not only will lower the costs for the HMO(s), but it will raise them for the conventionally covered enrollees, further adding to the subsidy received by the HMOs. This is possible both in the Medicare program if the fee-for-service payments in a county rise due to selection thereby increasing the AAPCC, and in employer-sponsored plans in which the employer’s contribution rises with conventional insurance costs. Uncoupling the size of the contribution from the performance of the fee-for-service option is therefore desirable. For Medicare, this may mean basing the “county rate” on either national rates or an average of local and regional rates, thereby diluting the effect of selection in the local area. Employers may focus more on their total compensation package and less on maintaining a given net premium in the conventional plan.

In addition to such a formula approach, some have proposed either competitive bidding or negotiation of premiums. The Arizona equivalent of Medicaid has used competitive bidding to determine what it will pay HMOs for the coverage of various populations. Bidding alone, however, will do little to avoid biased selection. Instead, the bidding
would have to occur within each of the appropriate risk categories. Bidding also requires a willingness of the contracting agency occasionally to exclude a valued bidder with too high a price. This may not be politically feasible. In other instances, payers may negotiate rates with plans. In theory, at least, the negotiator would take a tougher position if the HMO was thought to be benefiting from favorable selection. One of the difficulties with such an approach is its inherent arbitrariness.

Luft has outlined another alternative in which all the plans in a local area are called upon to develop amongst themselves a method to allocate sponsors’ contributions to reflect selection biases. This would include the identification of risk categories and relative values for each category. Plans would be free to include combinations of approaches, such as responsibilities for disenrollees, and DRG-type payments for certain low-probability/high-cost cases. Each plan would have to try to convince the others of the validity of its approach and the specific weights assigned to each risk factor. Since the plans would be involved in a “zero-sum game” of dividing up a fixed contribution pot, claims of adverse selection without convincing evidence would be met with some skepticism. Luft proposes this plan for use by groups of employers in a given locality. Since each employer represents a relatively small share of any plan’s enrollment and since selection patterns are likely to vary substantially across employers, it would be difficult for any plan to manipulate the system.

Policy Considerations

Biased selection exists. In and of itself, selection is not necessarily undesirable. For example, some health plans may be excellent providers of prenatal care while others may have developed special capabilities in the treatment of people with AIDS. The goal should be not the random or “equitable” allocation of risks, but the adjustment of payments to compensate for unequal risks. If the appropriate mechanisms can be designed to measure and compensate for differential risks, then plans will compete on the basis of quality and efficiency, rather than selection.

While the simple sociodemographic factors used in Medicare’s AAPCC are not sufficient to remove even some major differences in risk, they are a major step forward over the unadjusted rates used by employer groups. In moving to adjusted rates, however, one must recognize the differences in the Medicare and employee markets and possibly use different variables. A more sophisticated version of the AAPCC is necessary, and better measures of eligibility for institutional care and improvements in the calculation of local “expected costs” are in order.

Risk factors alone probably will never account for enough of the
variability in medical need to adjust for biased selection sufficiently. Some form of prior or concurrent measures of need—either specific categories of hospital use, clearly measured diagnoses, separate risk pools for rare but expensive cases, or a blended capitation and fee-for-service model—is probably necessary. The task here is to develop measures that are reasonably accurate and difficult to game, and yet that maintain the appropriate incentives. It is not clear that one can determine the best approach merely through analyzing existing data and simulation models. Demonstration projects probably are needed to determine what is administratively feasible and adequate to maintain a reasonable offset to biased selection. A new design for a bank vault is best tested not by careful scrutiny of blueprints but by its resistance to highly motivated safecrackers.

Changing the rules of the game may make it easier to reduce selection bias or compensate for it when it occurs. Longer lock-in periods, or at least periods of responsibility even if someone disenrolls, will reduce the rewards to a plan that encourages high-cost people to switch to other providers. It also may be helpful to consider the appropriate locus of control for the modification of payments. Health benefits are typically a relatively small part of most employers’ costs and certainly not an area in which they have much expertise. In contrast, health insurers and plans have strong interests in monitoring costs and selection factors. Rather than having employers develop as much expertise as the carriers, it may be better to force the carriers into competitive bidding situations or place them in a zero-sum game in the allocation of risk factors.

Finally, the overall goal of such changes should be the design of an environment in which people have the opportunity to choose the health plan that best meets their needs while plans are adequately compensated for the resulting differences in risk. It is important for both plans and enrollees to have the sense that the system is designed to be fair. Reductions in payments to a health plan should be clearly related to visible changes in enrollee composition or cost. Plans should not think payments are being reduced arbitrarily to protect the sponsor’s fee-for-service option or to allow an overall decrease in sponsor contribution while blaming the plans for selection. Without such a commitment to fairness, there is a real risk that the advantages of a competitive market will be lost in a scramble for short-term gains.

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1. To conserve space, only selected references are cited in this article; the full set of references is available from the authors at: University of California, San Francisco, Institute for Health Policy Studies, 1326 Third Avenue, San Francisco, California 94143.


6. Several other studies produced both an unadjusted (or less-adjusted) mean for a measure and either a more completely adjusted mean or a coefficient of the measure in a choice equation (HMO versus non-HMO). In many cases, two methods of determining selection bias for the same measure produced the same result; however, as in Marshfield case, in a few cases the different methods produced quite different results.

7. While we decided to confine this review of the literature to HMO versus non-HMO enrollment, an exception is the study by Willard G. Manning et al., “A Controlled Trial of the Effect of a Prepaid Group Practice on Use of Services,” The New England Journal of Medicine (June 1984): 1505-1510, which compared use and cost statistics for enrollees randomly assigned to a prepaid group practice to use and cost statistics for enrollees already in the prepaid group practice. We note that a smaller, but growing, literature compares characteristics of people in different non-HMO plans.


9. For the few studies that had no statistical tests of significance, we had to make a couple of somewhat arbitrary decisions to use their results. We counted individual statistics of summary measures that were clearly close to zero, or which the author considered close to zero, as neutral. We then counted up positive summary results and negative summary results to derive our favorable, neutral, or unfavorable selection bias ratings.

10. We use the terms “observations” and “findings” interchangeably.

11. For a list of studies comparing new HMO enrollees to non-HMO enrollees, contact the authors.


14. For a list of studies comparing existing HMO enrollees with non-HMO enrollees, contact the authors.
15. For a list of studies comparing HMO disenrollees with either non-HMO enrollees, HMO enrollees who stayed in the HMO, or new HMO enrollees, contact the authors.
18. If these voluntary disenrollees are really not different on average from persons in the fee-for-service population, differences in costs between the two groups would decline in a subsequent period. Buchanan and Cretin produced some evidence of this latter pattern in their study. When they looked at up to $5,000 in health care expenditures for families of disenrollees, families had expenses in the second year of disenrollment that were lower than in the first. This difference was not statistically significant.
24. Arlene Ash et al., “An Analysis of Alternative AAPCC Models Using Data from the Continuous Medicare History Sample,” Health Care Research Unit, School of Medicine, Boston University, August 1986.