How Does The Employer Contribution For The Federal Employees Health Benefits Program Influence Plan Selection?

The design of competitive health reforms involves a trade-off between controlling costs and reducing risk segmentation.

by Curtis S. Florence and Kenneth E. Thorpe

ABSTRACT: Market reform of health insurance is proposed to increase coverage and reduce growth in spending by providing an incentive to choose low-cost plans. However, having a choice of plans could result in risk segmentation. Risk-adjusted payments have been proposed to address risk segmentation but are criticized as ineffective. An alternative to risk adjustment is to subsidize premiums, as in the Federal Employees Health Benefits Program (FEHBP). Subsidizing premiums may also increase total premium spending. We find that there is little risk segmentation in the FEHBP and that reducing the premium subsidy would lower government premium spending and slightly increase risk segmentation.

Competitive-market reforms have been suggested for Medicare as well as for private insurance. In such proposals, people would have a choice of several competing health plans. Enrollees would pay at least part of the plan premium, so that they would have an incentive to control spending. These proposals usually involve a government subsidy of premiums, at least for low-income people.

One model for such reform is the Federal Employees Health Benefits Program (FEHBP). This system has several features of a competitive market, since there are many health plans competing for enrollees, and the employees have the incentive to make cost-conscious choices, since they must pay more out of pocket for higher-price plans. Unlike most competitive reform proposals, however, payments to health plans are not established through competitive bids.

The advantages of competitive markets are well known. The goal of market-based health insurance reform is to provide a choice of plans while holding down premium spending, through both competition among plans and cost-conscious choices by consumers. However, while the economic argument for competitive markets is straightforward and compelling for most goods and services, the effect of competition in insurance markets is sometimes ambiguous.

Danger of risk segmentation. One common criticism of competitive reform is that higher-risk people will enroll in the higher-benefit, higher-premium plans, and lower-risk people will enroll in the cheaper, lower-benefit plans. Such “risk segmentation”...
is not necessarily a negative outcome, in theory; but simply means that an enrollee will be charged a premium consistent with his or her expected spending. However, it can cause problems for choice-based systems when combined with certain other system characteristics. For example, in the FEHBP, plans charge the same premiums to all enrollees in a given market area (and the same premium nationwide for the national plans), there are no enrollment exclusions during the open enrollment period, and the plans have very few limitations on preexisting conditions. Under such conditions, higher-cost, higher-benefit plans may attract enrollees with higher-than-expected spending. The use of community rating can therefore result in an inefficient distribution of enrollees across plans. In addition, risk segmentation could lead to premium increases that may drive higher-benefit plans from the market, which would conflict with the "increased choice" goal of market-based reform. The potential for such problems has been called "the possibly fatal flaw in multiple choice's potential to contain costs."4

Controlling risk segmentation. One potential method for controlling risk segmentation is to risk-adjust a plan's premiums by the predicted cost of its enrollment pool, based on enrollees' observed characteristics. Subsidizing premiums in this way can limit risk segmentation because the percent-of-premium subsidy raises the incentive to choose higher-benefit, higher-premium plans, particularly for relatively low-risk people who would be likely not to choose those plans under a low defined-contribution subsidy. Because the development of other forms of risk adjustment has been problematic, this approach may be appealing to proponents of competitive reforms.

Establishing the sponsor's premium contribution to competing health plans is a key design issue. Some suggest tying the premium subsidy to the lowest-cost plan in the market. On the other hand, limiting the (defined-contribution) subsidy in this way will encourage cost-conscious plan choice and avoid the economic efficiency problems associated with moral hazard. On the other hand, in combination with community rating, it may result in risk segmentation. Absent some form of risk adjustment, selection could drive higher-cost plans out of the market and limit plans' ability to compete on price.

Our analysis examines this trade-off between total premium spending and risk segmentation associated with the use of premium subsidies to risk-adjust in competitive reform proposals. We examine plan selection in the FEHBP system to measure the extent of risk segmentation. We use our results to estimate how changes in the subsidy for FEHBP plans would change plan choices and the characteristics of enrollees in different plans. We address the following questions: How responsive are enrollees to differences in premiums and benefits? How do enrollees' characteristics affect plan selection? Do higher-premium, higher-benefit plans experience risk segmentation? And, if so, to what extent?

Structure Of The FEHBP

There are ten national health plans in the FEHBP. These plans charge the same premium nationwide, with the premium set by actuarial projections using claims in the prior year. The Office of Personnel Management (OPM) does not directly negotiate with the 285 (as of 1999) participating local managed care plans. Instead, these plans are allowed to participate with few restrictions, as long as the premiums they charge federal employees are not greater than those charged to other area employers with a similar number of enrollees (adjusted for demographic and benefit differences in the plans), and they offer benefits that meet the OPM's minimum standards.

Employees can choose freely among the plans available in their area. Total FEHBP spending depends on the premiums charged and employees' choices among plans. Each plan must provide a statutory set of benefits. Above these minimum standards, plans vary benefits in several areas, such as mental health coverage and the generosity of drug benefits. Since there are no enrollment restrictions during the open enrollment period, this raises
the question of how the FEHBP controls risk segmentation. Although there is no explicit system of risk adjustment, the employer contribution can act as an “indirect” risk adjuster. The FEHBP contributes 75 percent of the premium plan premium up to a dollar cap. Plans priced above the cap face a level-dollar premium contribution.\(^8\) We next examine the selection effect of lowering the subsidy cap to the lowest-price plan in the market.

**Enrollees’ Plan Choices**

Our model of health plan choice is based on the model originally developed by Michael Spence.\(^9\) In this model the enrollee chooses a plan that will maximize the difference between the value of insurance benefits expected and the enrollee’s premium. Expected benefit payments are simply the average coinsurance rate multiplied by the expected enrollee cost. For the FEHBP, the price to the enrollee is the premium paid out of pocket.\(^10\)

Plan selection depends not only on this premium but also on expected plan payments. Enrollees choose the plan that generates the highest expected value to them. In this context, risk segmentation means that the expected cost of enrollees in different plans, controlling for benefits and plan design, is not equal.

**Data And Study Design**

- **Health plan choices and enrollee characteristics.** Our data come from several sources. First, we use administrative data compiled by the OPM on the health plan choices of all federal employees and retirees. This file records the health plan and type of coverage (individual or family) that each employee selects. In addition, the OPM file records the employee’s age, place of residence (by county, metropolitan statistical area, and state), and annual salary. Since federal retirees who are eligible for Medicare choose FEHBP plans as Medigap coverage, we excluded them from our study and focus only on active employees under age sixty-five. Since we have limited information on family size and the availability of employer coverage for the spouse, we analyze plan choices only for employees who chose individual coverage.\(^8\)

Given the large number of data records, we conducted our analysis on a 10 percent random sample of all such enrollees.

- **Premiums and benefits.** We collected data on FEHBP premiums via the OPM’s Web site, www.opm.gov. Our data on plan benefits come from the *Checkbook Guide*, an independent publication that provides information about the different health plans in the FEHBP to assist government employees in choosing a plan during the annual open enrollment.

- **Individual coverage.** For 1996, the OPM administrative file contains records on more than 500,000 employees who selected individual coverage only. The range of possible local managed care plan choices is from one to twenty-one plans. An average of five local plans are available to FEHBP participants. About 10 percent of enrollees live in an area with no local managed care plan available. Therefore, the total number of plan choices available to FEHBP enrollees ranges from ten to thirty-one. Approximately 52 percent of individual enrollees chose a plan whose premium was above the government’s subsidy cap (primarily because the most popular plan, the Blue Cross/Blue Shield standard option plan, was slightly above the cap and was the choice of 34 percent of individual enrollees). The mean difference in out-of-pocket premiums between the least and most expensive plans was approximately $1,965.

- **Simulations of enrollment changes.** We used these data to estimate a logit plan-choice model, where the probability that a plan is selected is a function of the employee’s premium, plan benefits, age, sex, and income.\(^12\) We include the interaction of the premium paid by enrollees with age to examine how price-responsiveness varies with age. Absent other measures, we use age as a proxy for expected health spending and health status among government workers. Health plans experience risk segmentation if older enrollees are less sensitive to premiums than younger enrollees are, since older enrollees should have higher expected health care expenses and would be less likely to leave a plan if the premium rose relative to other plans’ premiums.
We then simulated the enrollment changes that would result from changes in the employer contribution. We did this by calculating the change in the enrollee’s premium paid if the employer contribution changed, and then using the parameter estimates from the plan-choice model to simulate changes in enrollment for the given out-of-pocket premium change.

Our analysis does not simulate any change in overall plan premiums attributable to the reduction in the subsidy cap. This may be a realistic assumption for the local managed care plans, since the FEHBP will constitute a small percentage of their overall enrollment. However, premiums for the national plans would rise if the reduction in the premium subsidy induced risk segmentation, and their premiums would fall if the reduction in the premium subsidy increased the competitiveness of the insurance market. Therefore, our estimates of risk segmentation should be interpreted as a lower bound of the risk segmentation induced by the subsidy reduction.

In presenting our simulations of changes in plan enrollment, we categorize plans based on premiums within each person’s set of choices. We define a choice set as all plans that operate in the metropolitan statistical area (MSA) where the person resides. If a person lives outside of an MSA, their choice set consists only of the national plans. For each person’s set of choices, we report the percentage of enrollees choosing a plan in the bottom, middle, or top third of the premium distribution. We calculate government, individual, and total spending on plan premiums.

Risk segmentation. We predict the mean age of persons choosing plans in each category by calculating the mean age of the enrollees in each category, weighted by the predicted probability that the plan is chosen. If the FEHBP plans experience risk segmentation, we would expect the predicted average age of enrollees in the more expensive plans to rise.

Data limitations. Several limitations of the data we use should be noted. First, we do not have controls for overall family structure or for the availability of coverage through a spouse. For this reason, we limit our analysis to those who chose self-only coverage. While this eliminates those who explicitly chose to cover dependents, we cannot be sure that all people in our data set faced the same choice problem. This could lead to the misspecification of our regression equation if people have access to non-FEHBP coverage and the independence of irrelevant alternatives does not hold for the insurance choices they may have had through a spouse. However, the FEHBP has high participation rates (approximately 89 percent of eligible employees), which suggests that non-FEHBP spousal coverage is not a viable alternative for most federal employees. Second, we do not have direct control variables for the health status of the enrollee, so we cannot directly measure enrollees’ risk profile. However, we do include age and sex in our estimates as a proxy for health status.

Study Results

Sensitivity to premium changes. The premium elasticity estimates from our model are presented in Exhibit 1. Results from our model of FEHBP plan choice show that enrollees are quite sensitive to changes in out-of-pocket premiums. Premium elasticity for all age categories is larger than 2 (in absolute value). This indicates that for a 10 percent change in premium, there is more than a 20 percent change in plan market share, on average. This means that a plan that enrolled 30 percent of employees in a given MSA would have its market share decline below 24 percent if its premium increased by 10 percent.

We also find that sensitivity to premium changes declines with age. This suggests that there is the potential for some risk segmentation in the FEHBP, since older enrollees would be less likely to change plans if their premium increased relative to other premiums. The dif-
ferences in these effects are statistically significant, but the magnitude of the differences across age categories is small.

Enrollment, cost, and age distribution. Our simulations of enrollment, cost, and age distribution under the current subsidy structure are presented in Exhibit 2. In 1996 approximately 80 percent of individual-only plans received the full 75 percent premium subsidy. Therefore, the baseline case shows how a market-based system works with most of the plans being highly subsidized. The greatest share of enrollees chose a plan that was in the cheapest third of plans they had to choose from (50.8 percent), and almost 40 percent chose a plan in the middle third.

An interesting result of this simulation is that the average age of enrollees across the different cost categories is similar. People who chose the most costly plans are only a little over one year older, on average, than those who chose the least expensive plans. This suggests that under the current subsidy cap, the magnitude of risk segmentation in the self-only FEHBP plans is small. Overall, spending on premiums for individual-only enrollees was approximately $1 billion. Of this, almost 29 percent is enrollee payments.

Enrollment, cost, and reduced subsidy cap. Next, we simulated the change in enrollment, cost, and mean age for plans if the cap on the premium subsidy were set so that only the cheapest plan in each market received the 75 percent subsidy. Enrollees then would pay the difference between this amount and the premium for any other plan they had to choose from. This change represents an average increase in annual out-of-pocket premiums of $395. Our model predicts that the share of enrollees that chose plans in the cheapest third of their choices would increase by almost sixteen percentage points. Most of this increase is attributable to a drop in the enrollment share of the “middle” category (a drop of 4.2 percentage points), while a smaller proportion comes from the top third of cost (4.2 percentage points). Assuming that overall premiums remained constant, this reduction in the subsidy cap would lead to a large reduction in government premium payments, an increase in enrollees’ out-of-pocket premium payments, and a reduction in overall premium payments. Under the new subsidy cap, employees would pay slightly more than 44 percent of premium spending, a thirteen-percentage-point increase in the share of expenses paid by enrollees. Overall premium payments (the combination of payments by the government and enrollees) would decrease by approximately 4 percent.
**EXHIBIT 2**
Simulated Plan Enrollment, Premium Costs, And Age Distribution For Self-Only FEHBP Plans With Current Premium Subsidy And Subsidy Set At Least Costly Plan

<table>
<thead>
<tr>
<th>Current premium subsidy</th>
<th>Government payments (millions)</th>
<th>Individual payments (millions)</th>
<th>Total (millions)</th>
<th>Mean age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premium</td>
<td>Plan enrollment</td>
<td>Low</td>
<td>50.8%</td>
<td>$347</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Middle</td>
<td>38.3</td>
<td>299</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>11.0</td>
<td>88</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>-</td>
<td>734</td>
<td>296</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subsidy set at least costly plan in market</th>
<th>Government payments (millions)</th>
<th>Individual payments (millions)</th>
<th>Total (millions)</th>
<th>Mean age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>66.3%</td>
<td>$366</td>
<td>$238</td>
<td>$604</td>
</tr>
<tr>
<td>Middle</td>
<td>26.9</td>
<td>148</td>
<td>139</td>
<td>287</td>
</tr>
<tr>
<td>High</td>
<td>6.8</td>
<td>37</td>
<td>60</td>
<td>97</td>
</tr>
<tr>
<td>Total</td>
<td>-</td>
<td>551</td>
<td>438</td>
<td>988</td>
</tr>
</tbody>
</table>

**SOURCE:** Authors’ regression estimates using Federal Employees Health Benefits Program (FEHBP) administrative enrollment data and plan benefit data from the Checkbook Guide.

- **Change in risk segmentation.** While the reduced subsidy cap would decrease premium payments for the government, there would also be an increase in risk segmentation for plans in the middle- and high-cost categories. For plans in the high-cost category, the age of the average enrollee would increase by almost one year; for plans in the middle-cost category, it would increase slightly more than a half-year. The average age of enrollees in the low-cost categories would be essentially unchanged (because the age of people who enter this category at the margin is approximately the average age of the low-cost category).

  This small increase in risk segmentation demonstrates how a proportional subsidy acts as an indirect risk-adjustment mechanism. When the share of the plan premium paid by the enrollee (relative to the lowest-premium plan) is increased, risk segmentation increases. However, given the small difference in premium-sensitivity across age groups, the magnitude of the risk segmentation is small. This also shows that the cost simulations may slightly overstate the reduction in total premium payments if this segmentation leads to an increase in overall premiums for the plans in the middle- and high-cost categories.

- **Implications For Policy**

  One of the goals of developing a choice-based system to reform Medicare or private insurance is to hold down overall health care spending while minimizing risk segmentation for health plans. In general, premium subsidies that cover a higher percentage of the plan premium help to induce lower-risk people to select more expensive plans. However, higher premium subsidies conflict with the goal of reduced total premium spending. The trade-off between subsidy levels and plan selection is an important factor in developing effective programs to encourage health insurance coverage.

  In our simulations of the selection and enrollment effects of different subsidy caps, we find that, overall, there is not a great deal of risk segmentation in the FEHBP under the current subsidy cap. The current cap is set at approximately the eightieth percentile of all self-only plan premiums, so most plans in the program receive the full 75 percent premium subsidy. Our policy simulations show that the government could greatly reduce its FEHBP premium spending if it lowered the cap to cover only the least costly plan in each market. However, such a subsidy change would raise the age of the enrollee pool for the more costly plans. We estimate only a small increase in av-
verage enrollee age for these plans. This suggests that the government could greatly decrease the cap of the premium subsidy without inducing severe risk segmentation. However, our results must be understood with the caveat that we are not modeling the change in overall plan premiums that would occur as the plan risk pool or the competitiveness of the market changes. If the decrease in the cap leaves some plans with higher average risk in their enrollment pool, their premiums will increase, and this could lead to a further shift in enrollment toward higher risk and more risk segmentation than we are simulating. An increase in the competitiveness of the health insurance market would lower the total premium charged by all plans.

One recent area of market-based reform based on the FEHBP model is proposals for tax credits that would subsidize the purchase of health plans by the uninsured who do not have access to employer-sponsored coverage. Our results suggest that a tax credit that covers a substantial share (or in some cases all) of the plan premium would likely lead to limited risk segmentation for health plans in a system managed as the FEHBP is. Since a large subsidy would be required to induce eligible people to participate, risk segmentation by health plans may not be a major concern where a large number of plans of various types compete for enrollees, given the FEHBP experience. However, we did not estimate the effects of premium subsidies on the uninsured population. If the plan selection of people in that population is different from that of FEHBP participants, our results may not accurately predict the risk segmentation that could occur.

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NOTES
6. Five other nationally available plans are open only to certain groups, such as the Secret Service plan. We do not include these plans here.
7. Of course, one approach for managing selection within the FEHBP is to limit the variation in plan benefits (generosity). While the OPM does indeed try to compress the variation in plan generosity, the plans do differ greatly with respect to copayments and coverage of mental health and dental services and prescription drugs.
8. The 75 percent government premium payment applies to nonpostal, “general service” employees. Postal employees receive a higher premium subsidy with a higher maximum. Since we simulate the effect of changes in the subsidy cap, we focus on only general service employees.
10. While the overall cost of insurance in the long run will theoretically be borne by the enrollee in the form of reduced wages, the marginal cost of the plan choice to the enrollee is the annual out-of-pocket premium.
11. Individual-coverage enrollees are slightly younger than family-coverage enrollees (43.5 years
versus 44.7 years) and are less likely to be male (44.9 percent for individual, compared with 66.8 percent for family enrollees).

12. A well-known feature of the conditional logit model is that it assumes the independence of irrelevant alternatives (IIA). That is, plans are assumed to be perfect substitutes, conditional on the plan characteristics controlled for in the model. We conducted a specification test on our model and found that it violated the IIA assumption. A typical way to relax this assumption is to estimate a nested logit model, where the nests are defined by the ability of enrollees to choose their own physician. See R. Feldman et al., “The Demand for Employment-Based Health Insurance,” Journal of Human Resources (Winter 1989): 115–142. We attempted a similar approach here but found that the nested logit model did not meet the IIA criteria within nests. Given the large number of choices in the model, other alternatives such as the multinomial probit are not computationally feasible. However, the effect of violating the IIA assumption is that the model underestimates the probability that a given choice will be made relative to any alternative. T. Amemiya, Advanced Econometrics (Cambridge: Harvard University Press, 1985), 298. Therefore, our estimates can be interpreted as being a lower-bound measure of premium-sensitivity in the FEHBP.

13. In the FEHBP, employees can enroll in the local plans if they either live or work in a list of counties that are provided in the plan brochure. These lists typically comprise the counties that are included in the Census Bureau’s definition of an MSA.

14. Expected spending and age means are calculated by using the predicted probability of choosing each plan as a weight in calculated a weighted average of the statistic in question.

15. Feldman et al., “The Demand for Employment-Based Health Insurance.”

16. Full regression results are available from the authors. Contact Ken Thorpe, Kthorpe@sph.emory.edu.

17. We report the predicted enrollment, cost, and age distribution from the model in order to have a consistent comparison for the simulated subsidy cap changes. The regression model predicts a slightly higher percentage of people choosing plans in the low- and high-premium categories than is observed in the raw data. However, the age distributions by category are very close to the same as those predicted by the model.

18. Our simulations slightly overestimate the share of enrollees that chose a plan in the top and bottom tier of premiums and understate the share in the middle. In the raw data, 48.2 percent chose a plan in the lowest third of premiums; 43.4 percent, in the middle third; and 8.3 percent in the top third. Our simulated average ages are similar to those in the raw data for the bottom and middle tiers (42.9 and 43.8 years, respectively). The simulations slightly underestimate the average age in the highest premium tier (44.4 years in the raw data).

19. To verify our simulated enrollment changes, we also performed the same analysis on people who chose family plans in the FEHBP. The subsidy cap for such plans is considerably lower in the distribution of plan premiums than it is for self-only plans (approximately the twentieth percentile of the distribution of all premiums). We found that even with a subsidy cap that is much lower in the distribution of premiums, there is little selection by age in family plans as well. The mean age of family plan enrollees in the low-cost category is 45 years; the middle category, 44.2 years; and the high-cost category, 44.2 years.

20. In a competitive labor market, such an increase in employee health insurance premiums would need to be offset by an increase in wages.