

RECORD, Volume 28, No. 3*

Boston Annual Meeting
October 27-30, 2002

Session 98PP

Premium Death Spirals: Theory and Empirical Evidence

Track: Education and Research/Health

Moderator: HARRY L. SUTTON, JR.

Panelists: ROGER FELDMAN†
HARRY L. SUTTON, JR.

Summary: This session presents the results of research projects funded by the Actuarial Education and Research Fund (AERF). One analysis, using data from the state of Minnesota, examines whether high- and low-health-risk consumers have different preferences for premiums and benefits. Another examines whether a competitive health insurance market can sustain health plans that appeal to high risks and reviews death spirals.

MR. HARRY L. SUTTON, JR.: Alain Enthoven has espoused the so-called managed competition theory during the past week. He said, "We've ruined the HMO system, because we have overlapping health care systems where all the doctors and hospitals belong to each system, and that is not the way to create competition in health care."

But one of the problems that we have seen is if we have four or five different health plans enrolling a very large employer group in a metropolitan area, how do you figure out who's going to join which plan? How do you set a premium rate for each plan?

* Copyright © 2003, Society of Actuaries

†Dr. Roger Feldman, not a member of the sponsoring organizations, is Blue Cross professor of health insurance at the University of Minnesota Health Services Research & Policy in Minneapolis, Minn.

The three papers that we are going to talk about today are on the SOA Web site, including all tables. The brief notes and slides we're using for the discussion of the papers will also be on the SOA Web site.

Roger Feldman and Bryan Dowd are Ph.Ds in the Division of Health Services Research and Policy at the University of Minnesota, and they have a unique record. They have been speaking for maybe 20 years about the problem of competition in health care, many aspects related to selection and why people choose one plan over another.

I will talk about managed competition with a low-ball premium rate in a competitive environment with multiple options for employees of a very large employer. Roger will discuss the other two papers. The grant to do some of this research, besides other foundations, came from the AERF and in part from the Society's Health Section.

As I just mentioned, the question is, when you're enrolling part of a group, even against an indemnity plan, who is going to choose which option? How do you proceed after you've had multiple enrollments for a period of time, and what could happen?

The first paper is basically a history, between 1994 and 1998, of the Minnesota State Employee's Group Insurance Program.

This group insurance program has been operating approximately 40 years. In the early phases, it was typical of many states. Essentially, Blue Cross was the major carrier in the state. Other carriers operated there—Aetna, Prudential, CIGNA and Equitable. However, there was just one plan, and Blue Cross was the major carrier with the state.

In 1957, an attorney general's opinion dealt with Group Health, which was fomented by faculty of the University of Minnesota. The doctors at the university were impressed with the single payer staff model system with salaried physicians. The opinion stated that if Group Health employed physicians and sold services for a premium, they were a legal operation, as long as they could provide all the services in-house. So they had salaried physicians; and even though there were some referrals out, they paid for them and that was legally a health plan.

Since they didn't own any hospitals, Group Health set up an insurance company to write hospital insurance that went along with the prepaid group practice plan. The Group Health plan has always been one of the favorite plans for enrollment for the university employees.

When we look at the size of the state employee group, the university employees were a major subset and sometimes, in later years, almost half.

After the HMO Act passed in 1973, Minnesota was one of the early supporters of the HMO movement as it expanded out of California in the 1970s. Paul Ellwood was the father of the term HMO and had proposed a health maintenance organization concept to president Richard Nixon, who was very interested in national health insurance.

Kaiser existed; so did GHA in Washington, D.C.; HIP in New York; Group Health Cooperative of Puget Sound: all sizable HMOs. But there were only a few million people covered under HMOs when the bill passed.

The federal government financed starting up 200 or 300 HMOs. Feasibility studies had to be not-for-profit to get government funding. And in Minnesota, eventually, the state permitted Group Health to become an option to the state employees. If Group Health cost more than the Blue Cross plan, where the employees resided, they had to pay the difference. If the HMO was cheaper than the Blue Cross plan, they didn't get a reduction in their contributions.

So there wasn't much advantage to the employees' cost by joining the HMO, but they could have thought it was a better health care system. And they did have a lot better benefits than the Blue Cross plan.

Later, in the 1980s, the state passed a law saying any HMO that was licensed in the state could be offered to the state plan. At one time, they had as many as 11 HMOs enrolling members. Some of them were only in one town, maybe outside the metropolitan area. So they really didn't have much access to the main body of state employees.

The state then formalized a policy to encourage HMO enrollments. And we're investigating only the state enrollment in the metropolitan Minneapolis-St. Paul area. There were seven counties. It's now up to 11.

The state's rules were that for single employees, the lowest viable health plan in your county would determine your contribution; so the lowest plan had a zero contribution for employee coverage only. Every other plan submitted a premium, and if the premium was higher, then the employee had to pay the difference out of his own pocket.

The state contribution was now based on the cheapest plan available in each county. Four or five HMOs—the big ones in the metro area—tended to operate in most of these metro counties. The other small ones were outside the metro area and those had a very limited population, maybe only a few hundred or a thousand employees.

For dependents the contribution was similar, but the state weighted the dependent costs separately; so the dependent contribution was based on the lowest cost dependent plan. To figure out the employee's contribution for families was slightly

complicated, because they might have to pay for the single employee, but they paid less for the dependents. The state required, generally, a 10 percent contribution of the lowest dependent coverage premium rate.

There were only two premium rates: single and family. Although a lot of the HMOs like to have three-tier premium rates, the state required they all have the same premium structure.

The state had the right to determine if the plans were fiscally solvent.

The state also reserved the right to design the benefit plans. A number of the HMOs offered more than one plan. The biggest HMO in the state, which is now called Medica, was a merger of two plans. One of them was Physicians Health Plan (PHP), which included ninety-plus percent of the total physicians in the state. You could self-refer and get your care wherever you wanted it.

It merged with Share Health Plan to form Medica. Share Health Plan was a staff model plan with salaried physicians and several clinics. It was successful and subcontracted with other clinics to expand, but never got really very large. It was one of the first to get a Medicare contract.

The HMO enrollments had reached stable development in 1994, with Blue Cross having about half the membership. Physicians Health Plan had a low membership, because its premium rates were the highest of any plan. The Share Plan, or Medica Primary, usually had the lowest rates, but they only had 2,000 enrollees. They were never attractive in a big way.

Then we had HealthPartners, a merger of Med Centers and Group Health, which was very attractive to the university, but not quite so attractive to the other big employers—General Mills, Honeywell and Control Data—at that time.

In 1995, the Physicians Health Plan decided it wanted to take over the state employee market. It cut its premium rate 25 percent across the board and it became the lowest-priced plan in every county in the metropolitan area overnight.

What happened was that in two years they became the largest plan. Some 15,000 employees switched coverage from the other HMOs. The way PHP worked, was to go into an employer with rates that were slightly below their indemnity rates. The young employees who weren't under severe medical treatment would join in, and they would get a younger subset of enrollment and make money; and they'd always shadow price the indemnity plan, whatever the selection might have done to it.

There were some studies done. I was involved in some with Honeywell and Pillsbury, which now has been absorbed by General Mills. The companies adjusted their premiums to try to equalize the differences based on the demographics of the

populations that joined the two plans. But, generally, most employers didn't do that because they didn't know how to do it. The federal laws made it appear that it would be illegal to do it. In some places where we did that as a consultant to employers, there was a question on whether the HMOs would sue us for adjusting the differences in rate contributions.

The state would never release any claim data. We talked to Blue Cross and asked if we could get a complete breakdown of the enrollment by demographics—age, sex, single employees, male and female, and families. We also did average family size, but that didn't seem to have any major effect on where people went.

We took a rate book, developed by a big consulting firm, and applied age/sex factors to each of the cells to see if we were constructing a rate for them based on that rate book, what the rates would have been, based on the demographics.

We had to adjust for maternity between single women and married women, spouses, and families and any other approximations we had made to fit the data set. The Blue Cross data set, for example, did not give us age zero, even though the state form indicated that. There wasn't any family size shift for families that was significant.

There are three tables here. The top one was the out-of-pocket premium for employee coverage (Figure 1).

Figure 1

Tables A.2, A.5

Table A.2
State of Minnesota – Monthly Out-of-Pocket Premiums, Employee Coverage (Twin Cities)

Coverage Option	1994	1995	1996	1997	1998
State Health Plan Select	--	--	2.66	0.00	0.00
State Health Plan (POS)	35.71	32.84	28.24	38.90	75.78
HealthPartners Classic	3.34	10.76	11.86	8.30	6.70
HealthPartners	33.28	41.14	25.44	23.18	23.04
Medica Primary	0.00	14.74	20.20	17.28	11.18
Medica Premier	38.22	0.00	0.00	11.74	--

Table A.5
State of Minnesota – Monthly Out-of-Pocket Premiums, Family Coverage (Metro Area)

Coverage Option	1994	1995	1996	1997	1998	1999	2000
State Health Plan Select	--	--	2.65	21.77	24.33	27.24	33.49
State Health Plan (POS)	60.99	76.14	62.64	155.88	213.72	239.36	309.82
HealthPartners Classic	14.82	81.57	14.81	42.52	41.07	40.84	72.35
HealthPartners	91.68	109.54	51.14	79.70	81.92	93.13	212.94
Medica Primary	21.90	57.65	55.14	64.97	49.12	113.49	--
Medica Premier	122.46	21.10	23.40	51.10	--	--	--

The zeros in Table A.2 show, in effect, the lowest cost plan available. At that time, there were five options. The State Health Plan Select, which is the top line, was invented by Blue Cross to somehow get back in the market in 1996 and had lower premium rates. But their earlier plan, which was the largest enrollee plan in the state at one time, was the State Health Plan POS, the second line.

The Medica Premier Plan in 1994 had the highest contribution rate, and the Medica Primary, which was its staff model, had the lowest contribution. The Medica Premier Plan dropped from \$38 to zero and stayed that way for two years. All the other contributions were based on that rate; so the other contributions went way up after Medica lowered its premium rate. That was an inducement for the employees to pick a lower-cost plan.

The benefit designs were almost identical between all the plans. Although, a couple of them were a point-of-service (POS) or a PPO, at least the in-network parts were similar. In 1995, the Medica Premier Plan did add a copayment on hospital admissions, to try to discourage people that were going into the hospital from signing up.

Table A-5 shows the monthly out-of-pocket premiums for family coverage. This had to be constructed from two tables and a series of our history of the actual rates charged by each plan for single employees and dependents.

You can see that the contribution for Medica Premier or its predecessor plan went from \$122 down to \$21. In other words, the state's premium rate for that plan dropped by \$100 per month per family. These tables just illustrate the difference in premium rates when this change was made.

The Blue Cross (POS) plan, which will show how much of a death spiral it went into, in 2000 had a family contribution of \$300, which was more than the total premium in 1994. Actually, in later periods, the premium rate went up to around \$800; and the plan still exists.

Figure 2 includes enrollment reports shown by the state and this only covers employees, but you can see the big changes in the different plans. They did not have a similar table showing the families.

Figure 2

Table A.3

Coverage Option	1992	1993	1994	1995	1996	1997	1998	1999
State Health Plan Select	–	–	–	--	6,838	14,074	24,983	28,870
State Health Plan (POS)	23,224	23,946	25,250	22,969	16,232	10,643	5,029	3,726
HealthPartners Classic	18,904	19,875	20,888	18,650	17,106	15,734	15,378	15,197
HealthPartners	3,559	3,614	3,332	2,451	2,517	2,761	4,760	5,748
Medica Primary	2,643	2,666	3,231	2,380	1,445	1,212	8,376	6,284
Medica Premier	6,614	5,622	3,793	10,584	16,681	16,497	--	--
TOTAL	55,5960	56,755	57,475	58,039	61,842	62,078	59,665	60,910

HS:imm/1029SOA

6

I can tell you, though, that Health Partners Classic—the old Group Health staff model—maintained its membership at a high level. And that's partly due to the university because its structure of clinics, with everything paid for and no co-payments, was very attractive to people with young families. They had greatly expanded and had eight or 12 clinics around the metropolitan area, so they were very convenient for families. You could get almost all your care at one spot.

This is statewide. So this data is different from some of the other data, which is only metropolitan area.

We had five-year age/sex groups, essentially, for each enrollee segment. We did not have age zero separate from which to estimate birth rates.

All we have is the Blue Cross data (Figures 3-7). We do not have the total data for the whole state enrollment in the metro area. We're measuring the change in the average expected cost of the Blue Cross enrollment from year to year.

Figure 3

Table 2(a)

Table 2(a)
 Minnesota State Employees – Metro Area Only
 Blue Cross Enrollment 1994-1998 (February Analyses)
 Expected Claim Cost Indices

State Health Plan (POS)

Family Enrollment		
	Cost Index	Number of Enrollees
1994	1.058	11,777
1995	1.065	9,763
1996	1.088	4,667
1997	1.119	3,034
1998	1.256	3,136

Single Female Enrollment		
	Cost Index	Number of Enrollees
1994	1.603	1,993
1995	1.621	1,763
1996	1.678	967
1997	1.700	696
1998	1.750	904

Figure 4

Table 2(a) cont'd

Single Male Enrollment		
	Cost Index	Number of Enrollees
1994	1.227	943
1995	1.259	855
1996	1.339	543
1997	1.394	416
1998	1.584	478

Total Combined Enrollment		
	Cost Index	Number of Enrollees
1994	1.142	14,713
1995	1.157	12,381
1996	1.202	6,177
1997	1.244	4,146
1998	1.389	4,518

- Notes:
- Cost index based only on age/sex risk adjuster, independent of inflation trends
 - Medica Premier lowest cost plan 1995-1996; withdrawn 1998
 - State Health Plan Select effective 1996; low cost plan 1997-1998
 - State Health Plan (POS) most expensive plan 1996-1998

HS:lmn/1029SOA

8

We broke it down into family enrollment, single female, single male, and total. So the cost index for families in '94—this is the State Health, which was a POS plan—is close to a cost index of one; it's 1.06. Its premium rates went way up, and its cost index factors rose sharply—about 20 percent in the four-year period. Enrollment dropped by about 75 percent. That plan went into a big death spiral, because the other plans were cheaper, and the benefits of all of them were essentially similar.

One of the interesting things is to look at the cost weights of the other set. The females didn't go up nearly as much. While the families went up 20-plus percent, the females only went up about 10 percent. But they're high factors because of the leveling by age. The maternity cost is a factor even for single females. Their cost index is much higher and flatter, because it doesn't go up so much by age.

Similarly, single females did not tend to move as much as the others. They only dropped 50 percent, whereas the total family people covered dropped 75 percent.

The single male enrollment changed more dramatically, as men switch much more easily than the women. For males the cost went up about 30 percent, and their enrollment was cut in half.

Combined enrollment showed a cost index starting at 1.14 and finishing up at near 1.40, about a 25-percent increase.

At the end of the third year of the frozen reduction of 25 percent in premiums, Medica clearly needed a rate increase. Medica had told the state earlier, "We'll

probably lose money for a while, but by the end of three years, we'll control medical care costs. We'll know what we're doing, and the costs will come down; so we'll fall right in the middle of everybody else."

It was estimated they lost approximately \$100 million over that three-year period. Now remember, there was no inflation in these cost indices. This is the same constant factor applied just to the people count by age/sex. So a change in the cost index is due solely to a change in the age/sex composition of the people signing up. I happen to think this is a minimal effect, and that the anti-selection due to health status would have made the figures more severe than they show in the tables.

The second table is the State Health Select Plan, which was not a PPO and had limited physicians to ones that the Blues knew were efficient, low utilizers (Figures 5 and 6).

Figure 5

Table 2(b)

Table 2(b)
Minnesota State Employees – Metro Area Only
Blue Cross Enrollment 1994-1998 (February Analyses)
Expected Claim Cost Indices

State Health Plan Select

Family Enrollment		
	Cost Index	Number of Enrollees
1994		NA
1995		NA
1996	.919	7,305
1997	.910	9,493
1998	1.107	17,764

Single Female Enrollment		
	Cost Index	Number of Enrollees
1994		NA
1995		NA
1996	1.541	732
1997	1.536	1,681
1998	1.569	3,578

Figure 6

Table 2(b) cont'd

Single Male Enrollment		
	Cost Index	Number of Enrollees
1994		NA
1995		NA
1996	.870	403
1997	.819	1,100
1998	1.559	2,205

Total Combined Enrollment		
	Cost Index	Number of Enrollees
1994		NA
1995		NA
1996	.970	8,440
1997	.987	12,274
1998	1.219	23,547

Notes:

- Cost index based only on age/sex risk adjuster, independent of inflation trends
- Medica Premier lowest cost plan 1995-1996; withdrawn 1998
- State Health Plan Select effective 1996; low cost plan 1997-1998
- State Health Plan (POS) most expensive plan 1996-1998

HS:lmn/1029SOA

10

This plan didn't exist the first two years, but when they came in with a low premium rate, a lot of the people from the other Blue Cross plan, as well as other plans, shifted. The first year of enrollment they picked up 7,300 people, which is a big chunk of the total. Their family cost weight was around .91, which was much lower than the POS plan had been before.

It picked up another 2,000 or 3,000 in 1997. And in 1998, the Medica plan was discontinued; so all the people that had been in the Medica plan shifted back to Blue Cross or the other options that they had.

The average cost factor in that one year increased about 20 percent. Many of these plans lost money because of employees moving from one plan to another, without being able to predict who would move.

The single female enrollment picked up the most of the other female enrollment. Their cost index stayed almost unchanged at 1.5-plus.

The single male enrollment cost index had been running a 1.50-plus in the POS plan, and when they shifted to this plan the cost factor nearly doubled. So the single males changed plans more easily than the females. Their cost factor is high (they have a number of male employees over 70 still working full time), implying a somewhat older population.

Part of the problem is that the state employees and the university employees have no coverage after they retire. I think plans are made available, but the retiree pays the full cost; and it's been very difficult for them to find coverage. And so a lot of them, if they have medical problems, might keep on working until they can get it cleared up.

For the combined enrollment, the cost index went from .97 in 1997 to 1.22 in 1998. That is a good 20-percent-plus jump in the average cost for this plan in one year. The enrollment in that one year almost doubled from 12,000 to 24,000.

Taking a summary of the combined index, you'll see that Blue Cross enrollment in the old plan had already started to shrink down to 3,000 or 4,000 (Figure 7). Medica enrollment went way up. However, the new Blue Cross plan enrollment grew to 23,000; so the total Blue Cross enrollment in the metropolitan area doubled—but the combined average mix cost index rose about 10 percent.

Figure 7

Table 2(c)

Table 2(c)
Minnesota State Employees – Metro Area Only
Blue Cross Enrollment 1994-1998 (February Analyses)
Expected Claim Cost Indices

Combined Total Blue Cross

State Health Plan (POS) and Select		
	Cost Index	Number of Enrollees
1994	1.142	14,713
1995	1.157	12,381
1996	1.069	14,617
1997	1.052	16,420
1998	1.246	28,065

Notes:

- Cost index based only on age/sex risk adjuster, independent of inflation trends
- Medica Premier lowest cost plan 1995-1996; withdrawn 1998
- State Health Plan Select effective 1996; low cost plan 1997-1998
- State Health Plan (POS) most expensive plan 1996-1998

The data has strongly suggested that the people that went into Medica were higher cost than average. It would be very interesting if we could get all the data and see who went up and who went down.

In summary, each HMO in the state had to furnish a data breakdown by age/sex for Dec. 31, and for Feb. 1, for the new enrollment which took place in November each year. So, we obtained the old demographics and the new demographics. The state data was not useable, but Blue Cross could sort their data to produce these tables.

One of the questions I asked in the beginning was, "Who saved money?" The state saved money on paper, because its contribution actually dropped between '94 and '95 when the low rate came in. On the other hand, all the other employees who didn't join that plan had increased contributions of \$10 to over \$50.

The state and Medica enrollees also benefited from the fact that the HMO lost \$100 million over that three-year period. However, the plans lost so much money with all this juggling around of the enrollees that they refused to quote a firm premium in subsequent years.

The state then had to change to ASO. They did it for several reasons, but one of the main ones is that they had a hard time getting anyone to bid on a subset of this population after what had happened over this four-year period. As a result of this, none of our health plans will bid against another carrier to enroll a subset of the group. They will bid on the whole group, but if they don't get all of it, they won't bid. This is becoming prevalent practice around the United States. Since coalitions and big employers have multiple options to enroll, some of the plans really get a bad deal out of it.

Many HMOs have recently dropped out of the federal employee plan. I think it's because they've always lost money, but they just wanted to be in there to advertise. I think they found they were never going to make any money with the federal government and they would just get out.

Many researchers are in favor of the 'managed competition' concept. This data suggests if somebody just came in with a low rate, they'd get a large subset of the population, but not necessarily low cost.

In Minnesota, these employees had had multiple options for years. They felt very comfortable—particularly if their doctor was in both plans—shifting from one plan to the other.

I think Group Health, which was a staff model and employees would have to change doctors, didn't suffer some of the same losses that the other plans did. Changing doctors is a limitation, and having to switch to a plan where you don't have the same choice of doctors, or a more limited choice, would affect the number of employees who would switch plans.

FROM THE FLOOR: Your index that you showed on the exhibits, I believe that was just the age/gender mix of the enrollees. Were you able to look at actual claim experience?

MR. SUTTON: The state will not release it. The HMOs won't release it. The state has told them they can't release it; so we tried to get something that would be more meaningful. If the age/gender factors had been close, I would have said, "Maybe there wasn't any selection, but the differences were so great."

FROM THE FLOOR: Right. That would really get to the selection impact, right?

MR. SUTTON: Right. This is selection only from the standpoint of age/sex and not for health status. But my estimate would be that if you factored in health status, the selection would be much worse than what I've shown.

DR. ROGER FELDMAN: In this set of papers, we're trying to explore the topic of premium death spirals from a number of different perspectives and with three very different health care programs.

The first of those was the State of Minnesota employees, which Harry described. It's a managed competition program run by a single, very large employer with about 50,000 employees and 140,000 or 150,000 covered lives.

The second paper looks at a program that's run by an employer purchasing coalition in Minneapolis called BHCAG, or Buyers Health Care Action Group. It's composed of about 20 or 25 employers, mostly large ones with about 250,000 active employees and dependents who may choose among a number of different health care options offered by those employers.

The third setting that we're looking at is the Medicare Plus Choice Program, in which selection might occur among and within the HMOs that are offered to Medicare beneficiaries.

These papers are all different; but at the end, I'll try to explain why we have different perspectives on the question of premium death spirals, which you think would be really easy to get a fix on. The basic theory of premium spirals is simple: some plan has a high premium, it gets bad risks, it has to raise the premium again, and it finally goes out of business.

It turns out that this process is far from that simple. In fact, I think when we summarize our work, we're not really sure yet if selection and death spirals are an endemic problem to these managed competition programs.

BHCAG

In the second paper we look at the Buyers Health Care Action Group in Minneapolis. We use a very different method to look at selection than in the first paper.

The first paper employs a straight actuarial approach. The second paper uses what might be called a consumer research approach, or even a marketing approach.

It starts from the fact that at any point in time, only about 3 percent of the working population rate their health as poor. Most people at a point in time will tell you they're in pretty good health. These are data taken from the Medical Expenditure Panel Survey, which covers 21,000 noninstitutionalized adults and children in the United States. But over time, the odds of becoming chronically ill or experiencing a spell of poor health increase dramatically. For example, about 35 percent of the population reaching age 65 will have at least one spell of nursing home care during their lifetime.

The difference between good health at a point in time and the risk of poor health over your lifetime raises perplexing problems for the purchase of health insurance. Suppose that a person currently in good health cared only about the services that he would use—such as well baby care for his family or maybe annual physician exams—and he wanted to buy a health plan that offered those services at the lowest possible price. He didn't care about services that were used by sicker people, such as care for diabetes, cancer or heart disease.

A shortsighted healthy person would purchase such a plan, and competition in the marketplace would drive the premium of that plan down to a very low level, not only because it didn't cover the expensive services, but because the people purchasing it were healthy. However, once that person became sick and wanted a plan that covered these more expensive services, he would find that the premium was sky-high, because the only people purchasing that plan were sick people.

I'm going to call this *classification risk*. Economists have argued that risk-averse consumers would want protection not only against the cost of health care during a given year, but they'd also want protection against having their risk reclassified and being charged a very high premium if they became sick at any point in their lifetime. If they became sick, then it would be much easier to maintain stable insurance pools that provide protection against classification risk.

The goal of this paper is to use a simple but unique approach to determine whether healthy and sick consumers have different preferences. Our contribution to the research was that we *asked* consumers to rate the importance of quality, premiums and other health plan characteristics. We performed a statistical analysis on the data to determine whether health affects consumers' preferences.

Our data came from a survey that we conducted of 971 single employees with no dependents who were drawn from 19 of the member companies in the BHCAG purchasing coalition. Of note, the services in that health plan are delivered by 15 different and distinct care systems built around primary care providers.

In some sense, this program represents an attempt to revitalize Alain Enthoven's and Walter McClure's notion that competition should be based around unique physician groups with non-overlapping networks. Each primary care physician who's a member of this program can belong to only one of those 15 care systems.

The care systems submit premium targets that are risk-adjusted and grouped into three cost tiers for the purpose of determining the employees' out-of-pocket premiums. If you want to buy up from the lowest to the middle tier, you have to pay an out-of-pocket premium; and then there's another buy up for the higher tier.

Here are the questions we asked (Figure 8): On a 1 to 10 scale, with 10 being very important and 1 being not at all important, rate each one of these features of a care system—not necessarily the one that you belong to, but the one that you would like. The first feature is low monthly premium costs. Second, can I see specialists in the network without a referral? Third, does the system include high-quality doctors and hospitals? Fourth, do the doctors and hospitals have convenient hours and locations? Finally, can I make an appointment without waiting a long time?

Figure 8

Questions

- On a 1-10 scale (10 being very important), rate the importance of each feature of a care system:
 1. Low monthly premium cost
 2. See specialists in the network without a referral
 3. The care system includes high-quality doctors and hospitals
 4. Doctors & hospitals have convenient hours and locations
 5. Make an appointment without waiting a long time

Our methods were to estimate equations where those ratings became the dependent variables, which we called preferences; and the independent variables were measures of health status and various other socio-demographic controls. Health was measured both as excellent, good, fair and poor categories and by the presence of chronic conditions.

I'm not going to talk in detail about these methods, but let's just say that one of them assumes that the scale has a continuous measure with a meaningful zero and that we can apply ordinary regression analysis. The other one assumes that the answers are ordinal and responses of "10" are different than all other responses. For that type of assumption we used a method called multivariate probit analysis.

Instead of presenting a whole table full of numbers, I thought it would be more instructive just to write "NS" for "not significant," "POS" for "positive," or "NEG" for "negative" to give you an idea of the sets of results (Figure 9). Of course, the most important set of results is down the far right column; measures of health are never significant in any of the equations.

Figure 9

Results (SURE)

Rating	Income	Female	Education	Health
Low Premiums	NEG	NS	NEG	NS
High Quality	NS	POS	POS	NS
Convenience	NS	POS	NS	NS
See Specialists	NS	POS	POS	NS
Short Wait	NS	POS	POS	NS

POS = positive effect, NEG = Negative, NS = Not significant

HS:imm/102980A

17

On the other hand, a number of the socio-demographic variables are significant. For example, higher income employees don't put as much weight on joining the care system that has the lowest premium. So you get a negative coefficient on income in the preference equation for low premiums (column 1).

Notice in the second column, where we look at whether or not the respondent is female, you get a run of positive effects, which indicates that women employees care more about high quality, convenience, seeing a specialist and short waiting times. This may be a function not only of the higher overall use of health care services by female employees, but of the fact that they are most often more knowledgeable than men when it comes to health care concerns.

I do want to mention that these effects are, on the whole, not really large. For example, the effect of having a postgraduate college degree on the importance of low premiums reduces your importance weight, let's say, from 8 to 7.5. It takes away about half a point on that scale. Although these effects are not large, for the most part, they do have some significance, both statistically and from an intuitively sound theoretical point of view as well.

Our study has several implications:

First, healthy and unhealthy employees have similar preferences for premiums, quality and features of a care system. The results imply that health insurance pools will not break down because of diverse preferences related to employees' health status. But control variables such as gender, education and sometimes income do matter, which suggests that separate insurance pools may form for certain population subgroups; but those pools, we think, will not be related to the employee's health.

Now, I'd like to speculate a little bit. This is a case study. It looks at an important program, but only one program.

Maybe the reason why we find these differences is because the care systems in BHCAG submit premiums that are adjusted for enrollee risk. So risk is taken into account by the pricing mechanism.

In addition, all of these care systems offer standardized benefit coverage. This is one of the prerequisites for managed competition that Alain Enthoven and others have argued for. In the State of Minnesota's program, even though most of the plans had pretty generous benefits, they didn't have standardized benefits and definitely didn't have risk adjustment. So it may be the case that the difference in findings between our first two studies is explained by the more complete implementation of managed competition in the BHCAG program.

Our third study is a technical paper, which looks at risk segmentation and inefficiency in the market for Medicare Choice Plans.

As you know, HMOs currently serve Medicare, but this program is not in the best shape right now. Back in 1997, almost 60 percent of all Medicare beneficiaries had a choice of two or more HMO plans in addition to standard Medicare. Lately, that number has fallen as many HMOs have dropped out of the program.

What we mean by *efficiency* in this setting is that people ought to join the health plan that provides the greatest consumer surplus, or the difference between what they're willing to pay to join the plan and the cost of their care.

Inefficiency arises when you have adverse selection with no experience rating. Adverse selection means that people who have the strongest preference to join the plan are also those who have the poorest health. No experience rating means that the plan has to set a single premium, which one would hope covers the average cost of care for all of its members.

Using graphical analysis, when you have adverse selection, it means that the people who are most willing to join your plan are also those with the highest cost. As more people join the plan, the average cost of enrollees falls. And so if you traced out the cost of all the employees, the premium you need to recover on average to break even falls.

On the other hand, because the new enrollees are less expensive, marginal cost lies below average cost. And the equilibrium enrollment at Q_c , where the plan just breaks even, is less than the efficient enrollment at Q_e .

The efficient enrollment at Q_e is where the plan is just charging enough money to cover the cost of the last person who joins. That person ought to be in the plan; all the other people after him shouldn't be. But you can see that if the plan ever tried to attract the efficient enrollment, they'd lose money. So that's what we mean by inefficient allocation or inefficient enrollment.

In this paper, we propose to measure the difference between Q_c and Q_e . We want to know if it is really large, in which case there's a great deal of inefficiency. If it's not so big, there's a lot less inefficiency.

One possible solution in our model is that so few people join the plan, it may have to be taken out of the market.

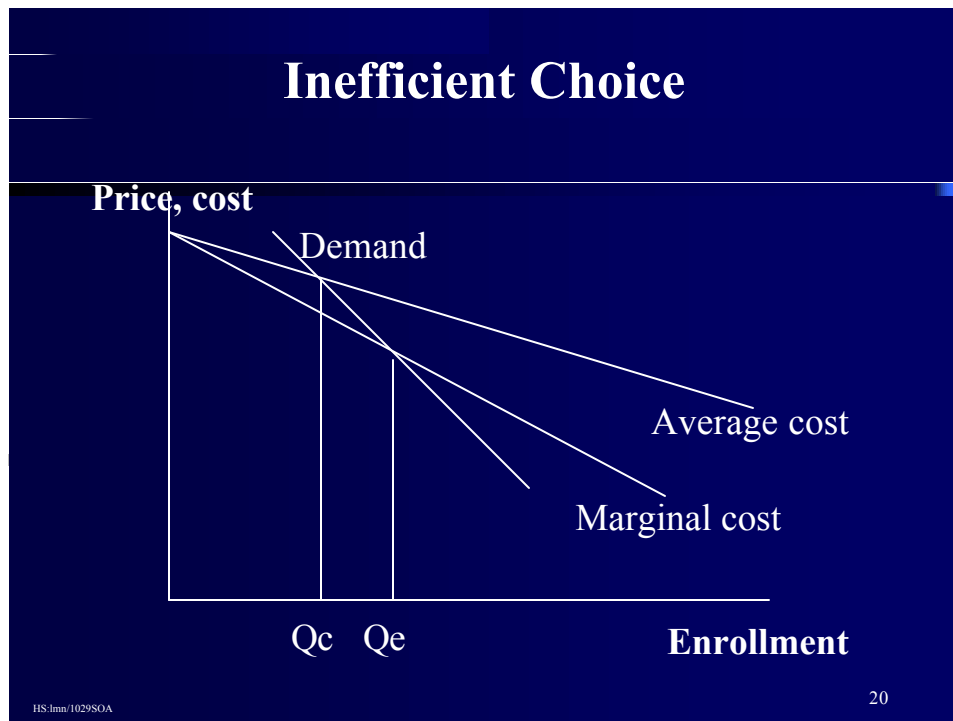
If you take this perspective, death spirals are just slow exits. There is nothing unique about a death spiral. It just means that this plan's efficient enrollment might be 50 percent, but the actual enrollment it can support in the market is zero. So it has to get out of the market, and the death spiral just means that it gets out of the market slowly. It raises its premium, loses some enrollment, raises the premium again, and so on until it is finally withdrawn.

So the plan of the paper is to propose a definition of inefficiency. And then we attempt to estimate these curves and to pinpoint the location of those enrollment points, Q_c and Q_e .

We were able to estimate the demand curve, but we had trouble estimating the average cost function. You can see that the demand curve slopes downward (Figure 10). Average costs slopes down as well. So essentially, with fancy econometrics, we're trying to sort out the position of two downward sloping curves; and we weren't able to do that. But we were able to estimate the demand

curve, or the relationship between premiums, other factors and enrollment. I will present some of the results from that analysis.

Figure 10



The first variable that I'd like to focus on is the out-of-pocket premium (Figure 11). The coefficient is minus 0.0291. That means as premium goes up, enrollment falls. That's the economic law of demand in operation. Although, -0.0291 looks like a small number, coefficients in our model have to be interpreted carefully.

Figure 11

The demand equation

2SLS ESTIMATES (OOP PREMIUM ENDOGENOUS)

Dependent variable: $\ln MS_j / MS_k$

<u>Independent Variable:</u>	<u>Coefficient</u>	<u>t-statistic</u>
• CONSTANT	-6.6901	-2.330
• OUT-OF-POCKET PREMIUM	-.0291	-2.705
• DENTAL COVERAGE	.4803	4.422
• GLASSES COVERAGE	.3882	2.775
• DRUG COVERAGE > \$800	.3989	3.301
• ELDERLY POVERTY RATE	.0168	.740
• % WITH COLLEGE ED.	.0186	1.414
• % WITH HIGH SCHOOL ED.	.0386	2.139
• M+C RISK SCORE	4.2492	2.003
• POS PLAN	-.1377	-.944
• STAFF MODEL PLAN	1.0766	5.776
• GROUP MODEL PLAN	-.0702	-.704

HS:lmn/1029SOA

23

I will interpret this coefficient by focusing on an M+C plan that has 25 percent of the M+C enrollment in a county. Look at the M+C sector, and then look at a plan that has 25 percent of that sector.

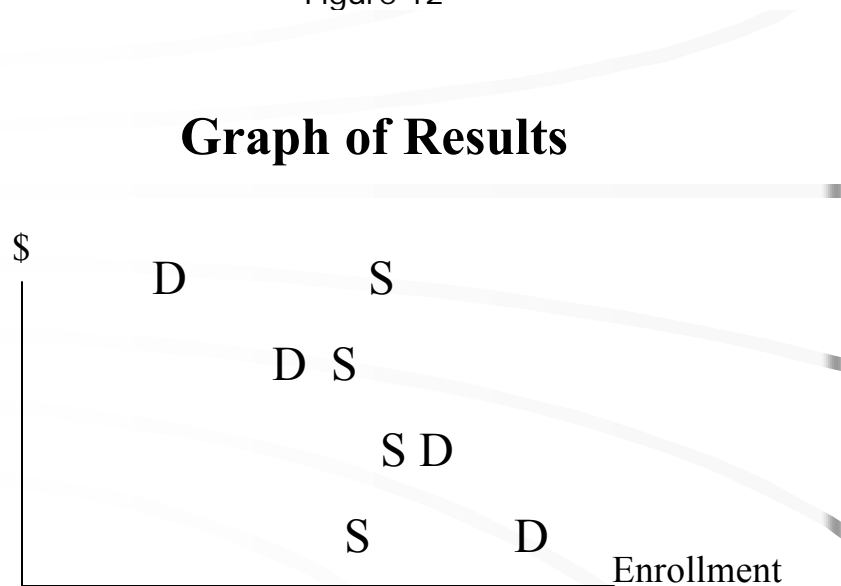
What would happen if this plan raised its premium by \$10 a month and the other plans held their premiums constant? The plan that raised its premium by \$10 a month would lose five percentage points of market share. So its market share would go down from 25 percent to 20 percent. This is, certainly, not a trivial falloff in market share for a premium increase of \$10. So our results do demonstrate that Medicare beneficiaries are sensitive to the out-of-pocket premiums that they have to pay for their different choices.

We could also interpret some of these other coefficients, such as offering dental coverage and offering drug coverage greater than \$800 per year (Figure 11).

If a plan has 25 percent of the market without offering drug coverage, it would gain about eight percentage points by offering drug coverage. We can't say that this would be a profitable move, because we don't know the cost of offering drug coverage. But our results do tell us that Medicare beneficiaries are strongly attracted to plans that offer dental coverage, eyeglasses and good outpatient drug coverage. This has some relevance for the current debate over how and whether Medicare should add a prescription drug benefit. For the HMOs that do have drug benefits, it's a powerful inducement to enrollment.

The following graph of our results might be instructive (Figure 12). Points labeled DDDD represent the demand curve—they display a nice downward sloping relationship between price and enrollment. But points labeled SSSS say that we could find no relationship between average cost and enrollment in a plan.

Figure 12



HSImm1029SOA

25

The implications are that, number one, demand for M+C products responds to out-of-pocket premiums and benefits as we predict. We can't say much about average cost or selection. Ideally we would observe plans' costs, but we cannot observe them; and this presented a problem that we tried to deal with.

Two of the papers analyzed characteristics of populations—that is, the BHCAG population and the State of Minnesota employees—and measured some effects of these characteristics on specific choice of plan options. The state employees' analysis found convincing evidence of adverse selection, while the BHCAG analysis did not. The data weren't complete enough to develop an accurate predictor of selection using the preferences of the choices. In many cases, the data don't produce significant statistical support for a particular choice other than price. If we learned just one thing from these and other studies that have been conducted by numerous university-based researchers, health plan consultants and the health plan companies themselves, it's that price does matter, and it matters a lot.

The cost of the choices—that is, the underlying cost of adverse selection—is very difficult to measure. The death spiral analysis shows that selection can be very strong, based on selection due to prices.

MR. SUTTON: I can simplify it: We have yet to figure out which questions to answer that will be able to predict what they're going to do.

Other than pure cost, nothing is very significant. A lot of people were interested in quality of care. I don't know how to define quality of care.

Maybe the questions we're asking don't quite fit the basis of the individual making the choice. Even though the BHCAG one shows that health status didn't seem to make any difference, I can't help but believe that the health status makes a difference. And the question is, I don't know how to get to that.

Price isn't exactly the only determinant. If you know you're going to need a kidney transplant, and you have access to the University of Minnesota that does them, or the doctors that do them, how you factor that into a choice? I don't know.

I think there are other studies that Roger and Bryan have worked on that clearly show that price is a major factor in a selection. I think the selection is worse, because the people who don't need any medical care are the ones who are going to take it. That creates the selection against the balance who don't go into that plan.

In the case that we saw, you might have assumed that Medica would get all the low-cost people. However, the low premiums attracted higher-than-average-cost people who were satisfied with their premium, but they couldn't resist making the change because their doctor was still in the plan. Not only did they get the low-cost people, but they also got the high-cost people.

They made an error in judgment. The first time enrolling a plan, when people don't know what a plan will operate like, the people without a need for medical care are more likely to join. However, after they've gone back and forth a few times, they know the plan will be okay, so they will change, even for a relatively small change in price.

Our conclusion there was that the HMO didn't estimate incorrectly that the low-cost people would shift. It was just they got a lot of the high-cost people shifting, too, because they had nothing to lose by shifting.

The actuaries in the company where I work analyze medical data to come up with preferable methods of care where the outcomes are better and cheaper. This is the kind of work we do in our consulting business, analyzing massive amounts of data. We're lucky we have access to the data.

Nobody has access to very much Medicare data yet, but some of these big data sets are now becoming available for anyone to use.

FROM THE FLOOR: On the BHCAG analysis, were all the benefit plans that were offered similar?

DR. FELDMAN: All the benefit plans offered under this system were identical. The companies, at their option, could offer additional health plans—HMOs, PPOs, whatever they wanted. Most of these employers were committed to total replacement. To make sure that we weren't contaminating the findings by looking at companies that offered similar products, we eliminated them from the study. That's why we only had 19 employers in the study, rather than the full set of 25 or so.

Since 1998, the movement to total replacement has stalled, and some of the employers are no longer as committed to this system as they were when it started.

MR. SUTTON: The state employees have now joined a system that's very similar to BHCAG. They now require bids with independent groups of doctors, and they base the employee contributions on an estimated cost for those groups of doctors and hospitals—and similar to the way the BHCAG did.

The year they switched to ASO, the premium cost was estimated to go up 31 percent. The HMOs who were going to be ASO estimated that the cost would go up, because they no longer had the fact of guaranteed premiums to incite their management to control the costs. We haven't found out how it comes out yet, but now they have adopted these care groups that bid with the state. The state was converted, in a sense, to the BHCAG.

FROM THE FLOOR: It seemed like that chart that showed health status had no significant impact from any of the variables that you looked at—such as benefit levels or what the insured would be out-of-pocket for certain benefits—where you would expect to see that kind of correlation.

DR. FELDMAN: I think that would be very possible if these plans offered significantly different benefits. If you don't mind, I would like to throw another piece of evidence into the pot.

I had asked one of my graduate students to analyze how price and health status affected actual choices instead of stated preferences. If people who are in good health care only about premiums and don't care much about quality or other features of the system, then we should find that the price elasticity of demand is highest for the healthy people and smallest for the sick. She did not find any such interaction between health status and price.

Also, if people in poorer health tend to look at the high-cost systems as offering better quality for reasons that we don't measure—they have better providers, for

example—she should have found that health status had a direct impact on choice of the high-cost systems. She didn't find that either.

FROM THE FLOOR: One of the things on the state plan that struck me, if I understood correctly, was that throughout that period, it was basically a two-tier rate basis, which certainly exacerbated the problem. I mean you had people making their decisions based on family size. The financial differences were really much greater than they would have been had you had a three-tier or some other kind of a rate basis.

MR. SUTTON: Yes. I did get a data split of the family employees to check the size of the different populations in the two Blue Cross plans and there did not seem to be any shift. However, the last year the average family went from like 3 to 3.2. I don't know, it didn't strike me as extremely significant; but they all ran from 2.9 to 3.1, regardless of which cell the families were in for any of those sets in any year.

FROM THE FLOOR: Yes, but on the other hand, were the family numbers different from the single employee numbers in terms of selection?

MR. SUTTON: Yes.

FROM THE FLOOR: I think that is significant.

MR. SUTTON: Again, the families did not go as heavily to Medica Premier, which was the low-cost plan. They stayed, to a large part, with Group Health; and many of them have probably been there for 10 years. I think part of that was the university, and we couldn't separate university employees from other state employees. But I think we would have found that the university was a little more stable.

FROM THE FLOOR: I guess the other point is that the decision to price the plan for employees based on the lowest-cost plan seems to me to be very shortsighted and kind of appallingly insensitive to the importance of continuity of care.

We see a lot of public entities, particularly with union plans, negotiate the cap that the employer's going to pay on a prospective basis before they really know what's going to happen to the benefit. So you end up depending on the market with situations in which you may have several plans that are essentially no cost or the same for employee-only coverage or even for dependent coverage.

We see some of our clients pricing on an average basis, where they have a lot more stability in enrollment. Despite the fact that some of the options or some of the plans may lose money in the short run, they're able to recover, and they're not as likely to go into that kind of a death spiral.

My observation would be that in employer-sponsored plans, part of the blame for this would rest squarely on the shoulders of the employer trying to squeeze additional dollars for the bottom line at the expense of continuity of care for its employees.

MR. SUTTON: Yes, I know. While they have saved tax money in the short run and saved money due to the HMO losing money in the short run, it disrupted their ability to have a stable plan. They ultimately shifted to the BHCAG type model on an ASO basis.

DR. FELDMAN: Right, I agree with your comment, as well. You can't conclude from this analysis that managed competition is inherently unstable—that is, that it's bound to death spiral. But I think you can conclude it is very prone to disruptive events. This was certainly a disruptive event.

It boggles my mind that a health plan, without any justification on the cost side, would cut its premium by 25 percent and hope that it could more than recover its costs by attracting many more healthy enrollees. We found out that they did get a lot of new enrollees, but they lost \$100 million.

FROM THE FLOOR: I think your experience here though is not uncommon with was happening at the time.

DR. FELDMAN: You had the Wisconsin State plan, which was almost similar. They based everything on the lowest cost plan.

FROM THE FLOOR: They still do, by the way.

But the California HIPC was for small employers, and the employee contribution essentially is based on the lowest option. And when it first started, they had many, many companies participate. And the companies that essentially had the lowest premium got the best risk, because there was a risk adjuster.

And then Iowa started one about the same time. And there was a company who's no longer around, and it did exactly the same thing it sounds like that Medica did; except it was too low, and it got the entire market. I think it shows if your rate's too much lower, you're not going to be able to skim the best risks. You're going to get a large portion of the market.

MR. FELDMAN: The California HIPC used a risk adjuster that was developed by Kaiser and is very similar to the DCG risk adjusters. In its initial years, it offered a couple of PPO plans.

The PPO received subsidies through the risk adjustment system, but it wasn't enough to keep it from leaving the program. Since then, the HIPC has been a lot more stable, and the risk bands—which is a plus or minus 5 percent that is needed to trigger the subsidy—have been triggered much less often.

FROM THE FLOOR: How they did the risk adjuster was for the next year. So if you were the PPO, you were always behind. You never got the full transfer, and so they pulled out.

DR. FELDMAN: The BHCAG risk adjuster is also retrospective, but it's based on three-month adjustment periods, which may explain why this system has had some greater stability.

MR. SUTTON: Yes, there is essentially a concurrent risk adjuster, at least within the current year. And the studies of health risk adjusters show that adjusting it for the current year is just like experience rating—it tends to equalize. But projecting a year ahead is not so good. It's not very accurate.

FROM THE FLOOR: I believe that health status makes a difference. One of the places that I think that you see that is in the Medicare Plus Choice Program. Historically, where some of the HMOs have offered two-tiered types of plans—where you had a basic plan and that was, perhaps, a zero premium and a higher option plan with a premium attached to it. It's the identical network. It's the same company. So issues like quality of care have been controlled.

You can clearly see in the data if that higher option plan has benefits in it that provide more coverage for the sicker person. The main example is drug coverage.

MR. SUTTON: Well, that's an easy selection, because the person knows how many drugs he's buying every year; and, therefore, he knows whether the premium he's paying for it is lower than or exceeds what he's been paying.

FROM THE FLOOR: But you see the type of people selecting that. The utilization rates in all areas of service are different.

MR. SUTTON: In California and Florida there were zero-premium plans. Because of the kind of stuff that we saw with the premium differentials, most HMOs were afraid to charge a premium until the very last minute.

In Kansas City, Humana tried a \$10 premium. It was going to cost them almost more than that to collect it. They wanted to see if they would keep their enrollment going from a zero premium and they kept 97 percent of the enrollees with a \$10 premium. Now, they're up to \$50 or \$100, even. The company wasn't quite as worried about the selection with the premiums versus the zero premiums.

But Humana still has plenty of problems, and it'd rather be with zero premium if it could.