Insurance, Prescription Coverage and Pricing

Employer Health Insurance Offerings and Employee Enrollment Decisions

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Objective. To determine how the characteristics of the health benefits offered by employers affect worker insurance coverage decisions.

Data Sources. The 1996–1997 and the 1998–1999 rounds of the nationally representative Community Tracking Study Household Survey.

Study Design. We use multinomial logistic regression to analyze the choice between own-employer coverage, alternative source coverage, and no coverage among employees offered health insurance by their employer. The key explanatory variables are the types of health plans offered and the net premium offered. The models include controls for personal, health plan, and job characteristics.

Principal Findings. When an employer offers only a health maintenance organization married employees are more likely to decline coverage from their employer and take-up another offer (odds ratio (OR) = 1.27, $p < .001$), while singles are more likely to accept the coverage offered by their employer and less likely to be uninsured (OR = 0.650, $p < .001$). Higher net premiums increase the odds of declining the coverage offered by an employer and remaining uninsured for both married (OR = 1.023, $p < .01$) and single (OR = 1.035, $p < .001$) workers.

Conclusions. The type of health plan coverage an employer offers affects whether its employees take-up insurance, but has a smaller effect on overall coverage rates for workers and their families because of the availability of alternative sources of coverage. Relative to offering only a non-HMO plan, employers offering only an HMO may reduce take-up among those with alternative sources of coverage, but increase take-up among those who would otherwise go uninsured. By modeling the possibility of take-up through the health insurance offers from the employer of the spouse, the decline in coverage rates from higher net premiums is less than previous estimates.

Key Words. Health insurance, managed care, uninsured, health insurance premiums

Although the vast majority of individuals under the age of 65 obtain health insurance through an employer, considerable variation exists across

employers in the health benefits they offer to workers. While many, particularly small employers, choose not to offer health insurance at all, the health benefits among those providing coverage to workers vary by the number and types of plans offered, the quality of the plans, and the premium contribution required from workers. Because the rising number of uninsured (from 38.3 million in 1992 to 43.6 million in 2002 [U.S. Census Bureau]) has been driven largely by increases in the number of workers declining coverage from their employer (Cooper and Schone 1997; Farber and Levy 2000; Cutler 2002), the effect of an employer's benefit structure on enrollment rates is increasingly important. Relatively little evidence exists, however, on how the health benefit decisions made by employers affect enrollment decisions of workers and their families.

Much of the relevant literature has focused on the effects of the employee's contribution to health insurance premiums (i.e., net premiums) on take-up rates of employer-sponsored coverage, particularly in light of evidence that net premiums have risen rapidly in recent years as a result of higher plan premiums and a reduction in the employer's contribution (Gabel et al. 2002). Gabel et al. (2001) find that the proportion of workers enrolling in the coverage offered by an employer plan is negatively correlated with the minimum monthly net premium of single coverage. Chernew, Frick, and McLaughlin (1997), using a sample of single workers in small businesses in seven metropolitan areas, find that, while participation of low-income workers in employer-sponsored plans is higher when net premiums are lower, even large subsidies will not induce all to participate. Blumberg, Nichols, and Banthin (2001), using the MEPS data set that contains a nationally representative sample of 6,500 workers offered insurance, find a small price elasticity of take-up for families, and a very small and insignificant elasticity for single persons. Gruber and Washington (2003), using personnel records for all federal employees from 1991 through 2002, find a small elasticity of employer insurance take-up with respect to its after tax price.

These studies, however, generally do not account for the availability of coverage from alternative sources. This is potentially an important omission.

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Abraham and Royalty (2005) find that having a second earner in a household dramatically improves both access to employer insurance and the generosity of the insurance obtained through the employer-based system. Many workers who decline coverage from their own employer are insured through an employer-based health plan from another source (Cooper and Schone 1997). In addition, evidence from the “crowd-out” literature suggests that many individuals who become eligible for public programs will drop their private health insurance (Cutler and Gruber 1996). Consequently, take-up of employer-based health insurance depends on offers from sources other than the worker’s employer, such as a spouse’s employer or a public program. To the extent that workers take-up coverage from another source when declining coverage from their own employer in response to the net premiums offered for such coverage, the elasticity of observed employer take-up may be higher than the elasticity of total coverage.

An aspect of employer decision making that has received relatively little attention is how the number and type of plans an employer offers affects employee take-up rates. Schone and Cooper (2001) find that workers who have a choice of different types of health plans are more likely to take-up insurance from their employer, are more likely to enroll in an HMO, and are more satisfied with the medical care they receive. Presumably different types of plans are more or less attractive to different workers, yet analysis of take-up of employer-sponsored coverage has not directly addressed this issue.

In this paper, we use a large, nationally representative household data set to analyze variation in coverage rates among those eligible for employer-sponsored health insurance. In particular, we measure the extent to which the characteristics of the health plans available to workers from their own employer affect the likelihood of enrollment in a plan offered by their employer, enrolling in an alternative source of coverage, or remaining uninsured. In the case of married workers, we also consider the effect of the characteristics of coverage available through employer of the spouse.

Our study makes two contributions to this literature. First, we do not assume that workers who decline their employer insurance offer are uninsured; they may take-up coverage from an alternative source. Second, for married workers, we consider the health plan characteristics of the offers from both the employee’s firm and the spouse’s firm. This allows us to directly examine the relationship between all employer offerings within a family and employee coverage decisions, rather than merely the take-up rates from a worker’s employer. This leads to more realistic estimates of how employers affect enrollment decisions of workers and their families.

CONCEPTUAL MODEL

Our analysis is based on a model of a worker making choices about health insurance in order to maximize a utility function whose arguments are health and consumption goods. We assume the worker is risk averse and hence the value they get from health insurance is based on protection from financial risk and that protection is independent of source of coverage. The person's utility associated with a particular choice is a function of how much health care she expects to receive under each option, which affects her expected health improvement, and other consumption. Consumption of other goods and services may change as a result of out-of-pocket payments for health care and/or net premiums. In turn, these outcomes will depend on plan characteristics such as quality, cost and premiums; individual characteristics such as income, family structure, and health status; and job characteristics such as part-time status that proxy for employer attachment and hence health plan continuity. The worker evaluates the level of utility associated with each available health insurance option and chooses the one which provides the highest level of utility.

An employee offered health insurance by her employer must decide whether or not to accept the offer. This decision is not equivalent to the employee decision of whether to take-up any insurance coverage or to go uninsured because the employee may obtain insurance from an alternative source. To simplify our analysis, we categorize the health insurance alternatives available to a worker into three groups. The worker offered own-employer health insurance simultaneously decides whether to accept coverage from her own employer, to obtain coverage from an alternative source, or to forego insurance. The utility of the own employer coverage option is derived from the health plan that provides the highest utility to the employee among the menu of plans offered by the employer. All else equal, offers of higher quality plans and lower net premiums will increase the utility of the own-employer option.

The utility of the alternative source coverage option is derived from the health plan that provides the highest utility to the employee among those readily available to the employee. A possible source of alternative coverage for married employees is coverage through a spouse. Although the spouse's decision to become employed and eligible for insurance may be made jointly with the take-up decision of the individual (Royalty and Abraham 2003), we assume that the employment and eligibility of the spouse is exogenous. As single employees do not have an opportunity to be covered by the employer of a spouse, generally the only alternative options for insurance are coverage

from the individual market or, if eligible, from a government program. The number of alternatives available in the individual market is typically much greater than from an employer but the premium for comparable coverage is generally much higher because of higher loading. Government programs are not widely available to employees under age 65 because of eligibility requirements and are determined by family income, presence of children, and state-specific requirements.

The utility of uninsurance for those offered health insurance from their employer is based on their additional income from avoiding net premium payments for health insurance coverage, their risk aversion, and the net cost of medical care they expect to receive if uninsured. This utility may be higher when the worker is less risk averse, when health care is inexpensive, when charity care is available and accessible, or when health care use is expected to be low.

The individual chooses the alternative which provides the highest utility. For the uninsured offered insurance, the added income from foregoing the cost of insurance outweighs their perceived health benefits from having insurance. We hypothesize that this would be more likely to occur when the net premium of health insurance is high given offers of similar quality and when the quality of the employer offer is low given net premiums of similar amounts. Alternatively, for those who choose their own-employer offer, this would reveal that they obtain higher utility from this option over alternative source coverage or no coverage. This is more likely to occur when the cost of own employer health insurance is lower or when quality is higher than the alternatives. This choice will also be more likely when a spouse has no offer of health insurance from an employer or the offer is characterized by higher net premiums or lower quality.

EMPIRICAL METHODS

Study Sample

The primary data source is the Community Tracking Study (CTS). The CTS surveyed households and physicians every 2 years starting in 1996–1997 and employers in 1997. We use both Round 1 (1996–1997) and Round 2 (1998–1999) of the CTS Household Survey (CTSHS) and the 1997 CTS Employer Survey. The CTSHS was administered to more than 60,000 people in each round and was designed to be representative of the civilian noninstitutionalized population in 60 U.S. communities and the country as a whole (Kemper et al. 1996). Respondents were asked about their health insurance coverage, employment, medical care use, and health.

We restrict the study population to employees offered health insurance by their employer. To arrive at this study population in the CTSHS, we exclude those not working for pay, the self-employed, and anyone under 18 or over 64 years of age as well as workers not offered health insurance through their employer. These excluded workers could be either working for firms that do not offer coverage or ineligible for the coverage offered by their employer. The study sample consists of 41,532 survey respondents: 15,014 single and 26,518 married subjects.

Study Variables

The dependent variable is a categorical variable indicating whether a worker has coverage from her own employer, coverage from an alternative source, or no coverage at the time of the interview. Those covered who identify their own employer as the source of their coverage are defined as having own-employer coverage. Those with no coverage are those who do not identify any type of health insurance coverage and then confirm they are uninsured when asked explicitly. The remaining subjects have coverage, but not from their employer. This residual category is referred to as the alternative source coverage category and may include coverage from an alternative employer, public coverage, or coverage purchased in the individual market.

Table 1 displays the proportion of the sample in each of the three categories by marital status. For employees in married families, 76 percent take-up their own employer offer, 22 percent take up alternative source coverage,

Table 1: Take-Up Rates among Nonelderly Employees by Source of Coverage

	<i>Married</i>		<i>Single</i>		<i>All</i>	
	<i>N</i>	<i>Percent*</i>	<i>N</i>	<i>Percent*</i>	<i>N</i>	<i>Percent*</i>
Take-up employer's offer	20,643	75.7	12,876	84.2	33,519	78.9
Take-up other offer	6,269	21.5	1,249	8.0	7,518	16.5
Gov't health insurance	559	1.9	523	3.4	1,082	2.4
Individual market	207	0.7	335	2.1	542	1.2
Employer sponsored	5,502	19.4	389	2.5	5,891	12.9
Uninsured	576	2.8	1,021	7.8	1,597	4.7
Total eligible employed	27,488	100.0	15,146	100.0	42,634	100.0

Source: Community Tracking Study Household Survey, Round 1 (1996–1997) and Round 2 (1998–1999).

*Person weights are used when estimating the percentage in each category.

and 3 percent are uninsured. The proportion of singles that take-up coverage with their own employer and who are uninsured (84 and 8 percent, respectively) are considerably higher. This is primarily because employer-sponsored health insurance from an alternative source is largely unavailable to single workers because they will not have a working spouse. In fact, our data show only 2.5 percent of singles versus 19.4 percent of employees in married families take up employer-sponsored health insurance from another source. As a result, total alternative source coverage is much lower for single workers (8.0 versus 21.5 percent). With fewer employer-sponsored options, single workers are more likely than married workers to take-up alternative coverage from the government (3.4 versus 1.9 percent) or from the individual market (2.1 versus 0.7 percent).

The key explanatory variables are the type of health plans offered by the employer, the plan premium, the net premium, and plan generosity. Type of plan offered comes from the CTSHS while the other key variables are imputed to each individual in the study sample from the 1997 CTS Employer Survey. We categorize the type of plans employers offer into three groups: HMO plan(s) only, non-HMO plan(s) only, or both.¹ The 1997 CTS Employer Survey is based on a national probability sample of establishments with 14,000 private and public employers within the 60 communities of the CTS. The survey contains characteristics of the employer such as industry, location, and firm size; and the characteristics of each of their health plans offered such as plan type (HMO, POS, PPO, conventional), premiums (total and employee share), and plan cost sharing (deductibles, coinsurance, and the out-of-pocket maximum for physician and hospital care). The survey also includes a summary measure of plan generosity which is the percent of total health care expenditures covered by the plan for an average nonelderly individual based on his/her expected use of physician and hospital services (Gabel, Long, and Marquis 2002).

The imputation was conducted by first using the employer-level data to estimate models of average plan premiums, lowest net premium, and average plan generosity as a function of predictor variables available on both the employer and household surveys. These variables include location (indicators of metropolitan statistical area for the 52 metropolitan area sites and set of counties for the rural sites), firm size (in six categories based on number of employees in establishment), industry (six industry groups), and plan types offered (HMO only, non-HMO only, and both). The predictive function was linear with full interactions by firm size.² We then use this model to predict the premiums, net premiums, and plan generosity for each respondent in the

household survey based on the respondent's location, firm size, industry, and plan type offered.

The plan premium is defined as the imputed average monthly premium for all the health plans offered by the employer. Net premium is defined as the premium to be paid by the employee net of the employer's contribution for the health plan offer that would result in the lowest net premium. We use the lowest possible net premium offered because this is likely to be the binding constraint for those who may be deciding whether to accept coverage or go uninsured. Plan generosity is defined as the imputed average generosity of all the health plans offered by the employer.³ Table 2 summarizes the imputed values on the household survey of premiums, net premiums, and plan generosity by plan type offered. This table suggests that the imputation yields values with face validity, but with less variation than would be expected if actual values were observed for each individual.

The CTSHS allows a linkage of the survey response of a worker with the survey response of the spouse. Using this information, we created a variable indicating whether the spouse has an employer offer and variables describing the offerings of the spouse's employer that are directly comparable with variables describing the subject's offerings.

Other variables in the model available from the CTSHS include personal and family characteristics such as gender, age, education, family income as a percent of poverty level, race, presence of kids, self-rated health, and

Table 2: Summary of Imputed Variables by Plan Types Offered

<i>Variables Based on Imputation from 1997 CTS Employer Survey</i>	<i>HMO Plans Only Offered</i>	<i>Non-HMO Plans Only Offered</i>	<i>Both Plan Types Offered</i>
Monthly family plan premium [†] (\$)	390	407	431
(st. dev)	(41)	(38)	(39)
Monthly single plan premium [†] (\$)	156	169	170
(st. dev)	(20)	(19)	(21)
Monthly family plan net premium [†] (\$)	124	118	87
(st. dev)	(32)	(33)	(38)
Monthly single plan net premium [†] (\$)	24	23	17
(st. dev)	(9)	(9)	(9)
Plan generosity [†] (%)	80.9	81.0	81.4
(st. dev)	(13)	(1.4)	(1.4)

Source: Community Tracking Study Household Survey, Round 1 (1996–1997) and Round 2 (1998–1999).

[†]Based on an average across health plan offers by the employer.

[‡]Based on the minimum across the health plan offers by the employer.

smoking status; job characteristics such as whether a person works part-time and his/her firm size; and the year of the survey. Cost of care in a health service market is also used in the model. This variable is the standardized, actuarial cost estimates at the county level calculated by Centers for Medicare & Medicaid Services (CMS) using the Adjusted Average Per Capita Cost (AAPCC) methodology. See Web Appendix (<http://www.blackwellpublishing.com/products/journals/suppmat/hesr/hesr00415/HESR00415sm.htm>) for the characteristics of the married and single samples.

It is not obvious *a priori* whether offering an HMO plan to employees in lieu of a non-HMO plan will increase or decrease take-up rates. Controlling for a plan's premium and generosity, being offered an HMO plan may reduce take-up with the employer relative to offering an alternative type of plan if potential enrollees believe that the restrictions imposed on utilization or provider access result in less effective care than that provided by less restrictive plans. Alternatively, many individuals, particularly those who value the management of their care and who may otherwise consider going without coverage altogether, may highly value these types of plans. Thus, the effect of an offer of only an HMO or POS plan on take-up and coverage is theoretically indeterminate.

The net premium is indicative of the relative price of the health plan from the worker's perspective. For this to be true, we assume that wages are set independent of the employer's contribution. Thus, if employees do not choose their job based on health insurance premiums, net premiums should be negatively associated with take-up rates. Premiums reflect the costs of administering the plan, the amount of care covered, and the cost of care provided. We control for administrative costs with firm size, costs of care with per capita Medicare costs, and out-of-pocket costs with plan generosity. We assume that the remaining variation in premiums reflects value differences across plans (e.g., because of differences in the amount of provider choice available to enrollees and administrative costs). Therefore, we expect higher premiums to be associated with higher take-up rates.

Empirical Model

To model the decision between own-employer coverage, alternative source coverage, and no coverage, we used multinomial logistic regression, which permits an explicit modeling of choice based on individual specific characteristics when there are more than two options in the choice set.⁴ We estimated separate models for married and single employees using the family premiums

for the married sample and the single premiums for the single sample. There are no spouse variables in the single model. Person-level sample weights are used for all regressions and person-level calculations. The Huber/White/sandwich estimator of variance is used to adjust standard errors for correlated observations within households. The estimation is done by clustering households with each cluster containing up to four observations if both spouses work and are surveyed in both rounds of the CTS.

RESULTS

The results of the multinomial logistic models suggest that the plan type offered affects enrollment decisions of workers and that these effects differ between singles and married individuals (Table 3). Among married employees, those who were offered only an HMO plan by their employer were more likely to enroll in a plan from an alternative source rather than the plan offered by their own employer relative to employees offered only a non-HMO plan (odds ratio [OR] 1.23, $p < .001$). This indicates that, controlling for premiums and plan generosity, an offer of an HMO only is less desirable when other employer options are available, suggesting that these offers are perceived as lower quality than a non-HMO offer. On the other hand, single employees, who are more restricted in their alternative sources of coverage, do not increase take-up of another source if their employer only offers an HMO. Our results also suggest that the availability of an offer of only an HMO plan increases rates of coverage among workers. Both married and singles are less likely to be uninsured if they are offered only an HMO plan relative to when they are offered only a non-HMO plan (OR 0.821 and 0.653, respectively), although this finding is statistically significant just for singles.

The availability of a choice of plans is associated with higher rates of enrollment in employer-sponsored coverage. When their own employer offers a choice of plans, both married and single employees are less likely to take up an alternative offer (0.763, $p < .001$ for married and 0.710, $p < .001$ for single) and less likely to be uninsured (0.457, $p < .001$ for married and 0.576, $p < .001$ for single). In addition, married employees are more likely to take-up coverage with an alternative source when their spouse's employer offers a choice of plans (1.698, $p < .001$).

Higher net premiums raise the odds of no coverage versus enrolling in the plan offered by the worker's employer for both married (1.005, $p < .01$) and single (1.020, $p < .001$) workers. Higher net premiums also raise the odds of

Table 3: Relative Risk Ratios of Multinomial Logistic of Take-Up Employer Offer, Take-Up Other Offer, No Insurance

	<i>Married Individuals</i>		<i>Single Individuals</i>	
	<i>Take-Up Other Offer versus Take-Up Employer Offer</i>	<i>No Insurance versus Take-Up Employer Offer</i>	<i>Take-Up Other Offer versus Take-Up Employer Offer</i>	<i>No Insurance versus Take-Up Employer Offer</i>
Plan types offered by employer (versus FFS only)				
HMO only	1.232***	0.821	0.909	0.653***
Choice of plan type	0.763***	0.457***	0.710***	0.576***
Plan premium offered	1.000	1.000	0.997	0.993**
Net premium offered	1.002**	1.005**	1.014**	1.020***
Plan generosity	0.940***	1.011	0.965	1.045
Spouse plan characteristics				
No employer offer	0.191***	2.330		
HMO only (versus FFS only)	0.943	1.020		
Choice of plan type (versus FFS only)	1.698***	0.580		
Spouse plan premium offered	1.000	1.003		
Spouse net premium offered	0.997***	0.996		
Spouse plan generosity	1.037	1.133		
Adult child lives with parent	3.261***	1.211	1.468	0.324
Adult child lives with eligible parent	3.144***	0.680	8.734***	4.935
Female	2.763***	1.491 [†]	0.786**	0.767**
Age group (versus 56–64)				
18–25	1.513***	8.438***	2.675***	4.050***
26–35	0.890	4.057***	0.907	3.098***
36–55	0.859	2.052**	0.874	1.748*
Education (versus less than high school grad)				
High school degree	0.943	0.505***	1.028	0.710
Some college	0.929	0.281***	1.030	0.592***
Bachelor's degree	0.820	0.147***	0.808	0.354***
Family income (versus over 500% of poverty)				
Below poverty level	1.063	13.373***	2.760***	7.218***
Between 100% and 200%	0.802**	8.042***	1.287	4.927***
Between 200% and 300%	0.927	3.662***	1.029	2.823***
Between 300% and 500%	0.945	1.580	0.910	1.828**
Part-time worker (versus full-time worker)	2.613***	1.445	3.346***	1.958***
Firm size (versus <25 employees)				
25–499 employees	0.761***	0.892	0.855	0.673**
500 plus employees	0.508***	0.563***	0.670**	0.381***
Federal government	0.749*	0.974	1.531	0.507*

continued

Table 3: Continued

	Married Individuals		Single Individuals	
	Take-Up Other Offer versus Take-Up Employer Offer	No Insurance versus Take-Up Employer Offer	Take-Up Other Offer versus Take-Up Employer Offer	No Insurance versus Take-Up Employer Offer
State government	0.532***	0.523*	0.789	0.473***
Local government	0.517***	0.563	0.656*	0.558
Medical cost index	1.001**	1.001	1.001*	1.002*
Race (versus white)				
Black	1.124	1.559*	1.386**	1.471**
Native/Asian/Pacific/Other	1.133	0.800	1.641*	0.894
Hispanic	0.890	2.237***	0.931	1.147
Kids in family	1.369***	0.809	1.841***	0.875
Self-rated health (versus excellent)				
Very good	0.960	0.815	0.829*	0.701**
Good	0.964	0.743	0.778*	0.797
Fair	1.062	0.907	0.876	0.929
Poor	0.943	1.129	1.499	2.193*
Smoke every day	1.053	1.516**	1.120	1.535***
Year of survey—1998	0.999	1.303*	1.100	1.032

Source: Community Tracking Study Household Survey, Round 1 (1996–1997) and Round 2 (1998–1999).

*Is $.01 < p\text{-value} \leq .05$;

**Is $.001 < p\text{-value} \leq .01$;

***Is $p\text{-value} \leq .001$.

taking up an alternative source of coverage for both married (1.002, $p < .01$) and single (1.014, $p < .01$) workers. For net premiums offered by the employer of the spouse, the same pattern is observed in that the odds of taking-up coverage from another source are lower when the spouse net premium offers are higher.

We find little evidence that the plan premium is associated with take-up decisions. The only case in which this variable has a statistically significant effect is for coverage rates for single workers.⁵ In this case, employees are less likely to be uninsured when their employer offers a plan characterized by a higher premium (0.993, $p < .01$). This result is consistent with an interpretation of premiums as a measure of plan quality: a relatively high premium suggests that a plan is more attractive than foregoing insurance altogether. In the case of plan generosity, we find that more generous coverage is associated with a higher likelihood of a married worker taking up coverage from her own em-

ployer relative to taking up coverage from an alternative source. However we do not find similar effects for single workers and plan generosity does not have a statistically significant effect on the likelihood of a worker enrolling in the coverage offered by his own employer relative to remaining uninsured.

The other coefficients in the model conform to previous research. The younger, the less educated, and the lower one's family income, the more likely one is to forgo health insurance. This is true for both married and singles. Consistent with previous studies, blacks, both single and married, as well as Hispanics in married families are more likely than whites to be uninsured. One notable difference between blacks and Hispanics is that the likelihood of coverage through alternative sources is higher for blacks. Both married and single part-time workers are more likely to be uninsured and more likely to take another offer. The presence of children in the family increases take-up of an alternative source. This may be the result of public health insurance being easier to access when children are present.

Lastly, the effect of self-reported health status on take-up and uninsurance is mixed. Singles with excellent health are more likely to choose being uninsured than those in very good health. This may reflect a higher value of insurance among those in less than perfect health. However, the group most likely to be uninsured is the poor health status group. This may represent a lower revealed preference for health and health care. This view is reinforced by the fact that smokers are more likely than nonsmokers to be uninsured.

To demonstrate the magnitude of the coefficients from the multinomial logit we estimate the degree to which changing net premiums to zero would change take-up and coverage. The simulation is conducted by first estimating marginal predicted probabilities for the average worker given the change in net premiums.⁶ We then multiply these probabilities by the number of eligibles to arrive at the change in population numbers. The simulation results are displayed in Panel A of Table 4 in absolute terms and as a percentage of the original number of people in the group. We assume employers will not alter their decision regarding whether or not to offer insurance nor alter wages.

We estimate that an additional 1,402,000 eligible adult employees would accept coverage from their own employer if net premiums were reduced to zero. The percent change in take-up of own-employer health insurance with respect to reductions in net premiums are 0.5 percent for married individuals and 4.9 percent for singles. This increase in take-up with one's own employer, however, does not reduce the uninsured by the same amount because some who take-up with their employer were previously insured through other sources. The totals obscure the differences between married and single work-

Table 4: Magnitude of Effect of Net Premiums on Employer Take-Up and Coverage

	<i>Eligible Adult Employees</i>		
	<i>Coverage through</i>		
	<i>Own-Employer Offer</i>	<i>Alternative Offer</i>	<i>Uninsured</i>
<i>Panel A: Magnitude of effect of net premiums estimated from primary multinomial logistic regression (Table 3). (Shown by estimating marginal effect of setting net premium offered to zero.)</i>			
	Change in Population (000)		
Married families	174	296	– 470
Single families	1,227	– 508	– 720
Total	1,402	– 202	– 1,190
	Change in Population (%)		
Married families	0.5	2.8	– 33.7
Single families	4.9	– 21.5	– 31.4
Total	2.2	– 1.6	– 32.3
<i>Panel B: Magnitude of effect of net premiums estimated from alternative model where spouses' characteristics are dropped. (Shown by estimating marginal effect of setting net premium offered to zero.)</i>			
	Change in Population (000)		
Married families (nonspouse estimate)	1,003	– 503	– 500
Single families	1,227	– 506	– 720
Total (nonspouse estimate total)	2,230	– 1,011	– 1,219
	Change in Population (%)		
Married families (nonspouse estimate)	2.7	– 4.7	– 35.8
Single families	4.9	– 21.5	– 31.4
Total (nonspouse estimate total)	3.6	– 7.8	– 33.1

ers. For married workers, the source of the change in the number of uninsured (– 470,000) is shared by take-up through one's own employer (174,000) and one's spouse's employer (296,000). For the single workers, the increase in take-up with one's own employer (1,272,000) overstates the total change in coverage (– 720,000) because in this case, lower net premiums "crowd-out" alternative source coverage (– 508,000). For singles, however, their predominant alternatives are the individual market and government insurance, which become less attractive. Married employees do not experience the crowd-out effect for singles because net premiums of alternative source coverage (i.e., spouse coverage) are reduced to zero along with the net premiums of the employer offer.

To quantify the importance of including information on working spouses in any estimate of the effect of employer health benefit policy on take-up and coverage, we repeat the simulation above for married families, but we perform it on a model run without the spouse characteristics included. This alternative model is intended to replicate studies, such as those using employer surveys, which typically omit spouse coverage options. This simulation is shown in Panel B of Table 4 where the increase in take-up of employer insurance (1,003,000) is accompanied by declines in alternative source coverage ($-503,000$) and the uninsured ($-500,000$). By ignoring working spouses, the crowd-out effect in singles erroneously appears in the married families estimate as well. Additionally, when spouse characteristics are ignored, the change in take-up from net premium reductions for married employees becomes 2.7 percent rather than 0.5 percent.⁷ Without considering how employer policy may influence the insurance offerings of the spouse, the sensitivity of net premiums with respect to employer take-up may be overestimated.

DISCUSSION

We find that the types of plans offered by an employer as well as net premiums affect worker enrollment decisions. With respect to plan type, employees are less likely to be uninsured when their employer offers an HMO only or a choice of health plans relative to only a non-HMO plan. However, married employees offered only an HMO are more likely than those offered only a non-HMO to take up coverage with their spouse rather than their own employer. This result has two important implications. First, it demonstrates the importance of distinguishing between the take-up of employer insurance and insurance status. While employers offering only HMOs may be characterized by lower take-up rates, this does not necessarily lead to lower rates of coverage. This is because many workers choose alternative sources of coverage when they are available in response to the availability of only HMO coverage from their own employer. This is likely to be because of a greater attractiveness of non-HMO plans. Yet, particularly for those without these alternative sources of coverage, employers offering only an HMO have higher coverage rates. This is likely because the previously uninsured find an HMO only offer more attractive than a non-HMO only offer.

The effects of plan type on enrollment decisions also suggest that some employers may have a strategic incentive to alter their choice of plan type offerings. Strategic incentives for employers are based on optimizing the trade-

off that exists between the incentive to have a workforce covered by health insurance and not to be the one to pay for it (Dranove, Spier, and Baker 1999). The employers' incentive to improve take-up may be tempered by the gain of having their married employees take-up coverage through the employer of their spouse. Our results suggest that, all else equal, employers who currently offer only non-HMO plans and employ mostly married employees may have a financial incentive to switch to offering only HMOs to obtain a partial subsidization of health insurance for their employees through spouses. This subsidy could cover additional take-up among single employees who would otherwise go uninsured.

We find net premiums increase the likelihood of employees going without coverage and of employees taking alternative sources of coverage. However, the magnitude of the effect between net premiums and coverage estimated here is smaller than in other studies because first, we do not assume take-up with one's own employer is equivalent to coverage and second, we consider offers from the employer of the spouse in addition to the worker's employer.

By modeling alternative sources of coverage in addition to own-employer coverage and dispensing with the simplification that take-up with the employer is equivalent to coverage, we find that changes in own-employer take-up as a result of changes in health insurance offerings overestimates changes in total coverage. In particular, employer policy crowds-out alternative source coverage for the single employee. That is, increases in own-employer take-up are a result of decreases in alternative source coverage in addition to decreases in the number of uninsured. However this crowd-out does not occur for the married employee if the employer of the spouse also experiences changes in health insurance offerings.

By considering the offers of the spouse's employer we can model a policy change that would affect the employers of all adult family members. The impact of this modeling choice can be shown by comparing our simulation results to a similar simulation conducted by Cooper and Vistnes (2003). The additional employees who would take-up their employer's offer if net premiums were reduced to zero is simulated to be 1.4 million in our paper and 2.5 million in Cooper and Vistnes (2003). The primary difference in the simulation is that Cooper and Vistnes did not model spouse offers. In our second simulation, where we imitate this model by ignoring spouses, we get an estimate of take-up of 2.2 million workers that is very comparable with their estimate of 2.5 million. This suggests that estimates that ignore the possibility of changes in offers from the spouse's employer may be 40 percent too high.

In summary, while much of the previous literature suggests that the price elasticity of demand for health insurance is relatively low, particularly at the margin of workers choosing not to take up coverage offered by their employer, our research suggests that in fact this elasticity may be even smaller when family decision making is taken into account. Nonetheless, Cutler (2002) shows that, even with a small price elasticity, the impact of increasing net premiums is sufficient to explain the rise in the uninsured in the 1990s.

This paper has several limitations that should be addressed. First, we lack individual-level data on the quality of health plans offered to employees or their generosity. We do proxy for individual-level quality of plan offers by including average premium and average generosity per plan type offered by firms of a given industry, size, and location. Our results indicate that these variables are plausible measures of quality of coverage, but without data at the individual level it is likely that some elements of unmeasured quality remain.

Another important limitation is that we take employer offers as exogenous. There are three assumptions buried here. One is that employers do not tailor their offers to the needs, preferences, or health of their employees (Bundorf 2002). A second is that employers do not set contribution policy strategically (Dranove, Spier, and Baker 1999). A third assumption is that employees take these offers as given and do not select jobs according to health insurance offers. The fact that employees can choose their jobs may induce a correlation between the offers made to them and unobservable characteristics related to their demand for health insurance. This latter assumption is especially problematic for married couples who may make joint employment decisions based in part on their respective health insurance offers (Abraham and Royalty 2005).

Finally, the multinomial logit model estimates relative risk ratios independent of the other alternatives. This property may be too restrictive if, for example, the addition of a nonemployer insurance category would change a person's probability of choosing employer insurance versus being uninsured.

We model the employee's decision to take an employer offer and the decision to go uninsured as a joint decision with respect to characteristics of one's own employer plan and one's spouse's employer plan. This set up allows us to illustrate that employer design of plan offerings does change take-up rates for the employer, but these changes translate to smaller effects on coverage rates for workers and their families. By offering only an HMO, an employer may reduce take-up among those who would get alternative coverage, but increase take-up among those who would otherwise go uninsured. We also found that coverage is sensitive to net premiums, but less than previously

estimated because, for those workers with a working spouse, if the net premium of the spouse's plan also changes then the relative differences between available choices will remain the same. These family dynamics cannot be ignored when considering policies intending to reduce the number of uninsured.

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NOTES

1. Survey respondents are asked "Is [plan name] an HMO, that is, a health maintenance organization?" If necessary, the interviewer elaborates as follows: "With an HMO, you must generally receive care from HMO doctors; otherwise, the expense is not covered unless you were referred by the HMO or there was a medical emergency." From this question we are not certain that the HMO group consists of group and staff-model HMOs, and point-of-service plans (Cunningham, Denk, and Sinclair 2001). While there may be some measurement error in this variable, those plans classified as HMO in this survey are more likely to use a gatekeeper system, to require approval for specialty referrals, and to provide enrollees with financial incentives to visit network providers (Polsky and Nicholson 2004).
2. The R^2 for these regressions were 0.09 for family premiums, 0.09 for single premiums, 0.07 for family employee contributions, 0.05 for single employee contributions, and 0.07 for plan generosity.
3. Alternatively these three variables could be defined using maximums or medians.
4. For employees with double health insurance coverage, it is possible for the first two categories to overlap, but we code all individuals with insurance from their employer as accepting the employer's insurance offer regardless of whether they also have insurance from another source.
5. Results do not change substantially when alternatives such as maximums or medians are used to define premium, net premium, or generosity.
6. The marginal predicted probabilities of changing monthly employee contribution to zero from 26 percent for married employees (M) and 13 percent for singles (S) are -0.004 (M) and -0.042 (S) for own employer, -0.006 (M) and 0.017 (S) for alternative source, and 0.009 (M) and 0.024 (S) for uninsured.
7. For an employer who acts alone to reduce employee contributions, the elasticities are different from those calculated because the spouse characteristics would not also go to zero. The elasticity for married workers in this case is -0.051 .

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