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High-Deductible Health Plans: Are Vulnerable Families Enrolled?

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Abstract

OBJECTIVE—There is concern that high-deductible health plans may have negative effects on vulnerable groups. The objective of this study was to compare the characteristics of families who have children and switch to high-deductible health plans with those who stay in traditional plans.

METHODS—This double-cohort study included families who had children aged <18 years and were enrolled in a Massachusetts health plan through employers who did not offer a choice of health plans. We identified families who had traditional health maintenance organization plans for a 12-month baseline period between 2001 and 2004 and compared families whose coverage was then switched to a high-deductible health plan by their employers with similar families whose employer chose to remain in the traditional plan (controls). Data came from health plan enrollment and claims datasets and census data. We used multivariate logistic regression models to compare the characteristics of families who were switched to high-deductible health plans with controls.

RESULTS—We identified 839 families who had children and whose employer switched them to high-deductible health plans and 5133 controls. Among families with large employers, the adjusted odds of the employer switching to a high-deductible health plan were higher for families living in high-poverty neighborhoods. Among families with small employers, the adjusted odds of the employer switching to a high-deductible health plan were lower for families with more children, above-average family morbidity, and baseline total expenditures >\$7000.

CONCLUSIONS—Among families with large employers offering a single health plan, those from low-income neighborhoods are more likely to be switched to high-deductible health plans. In contrast, families with small employers offering a single plan are more likely to be switched to high-deductible health plans if they are healthier and have lower baseline costs. These findings suggest that families with children in high-deductible plans may represent two distinct groups, one with higher-risk characteristics and another with lower-risk characteristics compared with those in traditional plans.

Keywords

health insurance; deductible; cost sharing; health policy; health services research

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What's Known on This Subject

Poor children are vulnerable to the effects of cost-sharing. Although adults who choose HDHPs seem less poor and sick, children and families without a choice of plans are an understudied and possibly higher risk population of HDHP enrollees.

What This Study Adds

This study is unique in focusing on children and families in HDHPs and on enrollees without a choice of plans. It alerts clinicians and policy makers to vulnerable subgroups who may be exposed to cost-sharing in HDHPs.

Because of escalating health care costs, patients and families are required to share more of the responsibility for health care spending. High-deductible health plans (HDHPs) are one of the most important and controversial developments in health insurance in recent years. Such plans attempt to control costs by increasing the enrollee share of health care expenses with annual deductibles of at least \$2000 per family. The prevalence of HDHPs has been rising, with 10% of employers offering a plan with a high deductible and 14.8 million adults enrolled in 2007.^{1,2} The percentage of HDHP enrollees with children has increased in the past several years as well.²⁻⁴

Proponents maintain that HDHPs will help contain costs and that their lower premiums will make coverage affordable to the uninsured.^{5,6} Critics argue that these plans will be ineffective and potentially harmful to enrollees.^{7,8} Pediatricians have expressed concern that the increased cost-sharing under HDHPs may lead to unmet health care needs and hurt quality of care.⁹

It is important to understand the characteristics of HDHP enrollees to monitor patients and populations at particular risk. Some have raised concern that disadvantaged groups will be adversely affected in HDHPs.¹⁰ The Rand Health Insurance Experiment showed that poor children are especially vulnerable to the effects of cost-sharing.^{11,12} There is also concern that HDHPs will contribute to adverse selection in the health insurance market if they preferentially attract healthier enrollees, leaving sicker individuals in increasingly expensive traditional plans.

Little information exists about children and families in HDHPs, although approximately one third of HDHP enrollees have children covered under their plan.³ Pediatric providers and policy makers need to know whether chronically ill and low-income children are being enrolled in HDHPs. In addition, data are limited regarding HDHP enrollees who did not have a choice of plans. These enrollees constitute half of the population in HDHPs nationally² and may be a more vulnerable population than those with a choice of plans.¹³ Industry sources suggest that HDHP enrollees without a choice of plans are more likely to have chronic conditions than those who choose HDHPs over other plans (Harris Interactive Strategic Health Perspectives Presentation to Harvard Pilgrim, unpublished data, December 15, 2004).

This study was designed to address the gap in information about which types of families are enrolled in HDHPs. The objectives were to describe the socioeconomic and clinical characteristics of families with children in HDHPs and to compare the characteristics of families whose employer switched them to HDHPs with those whose employer kept them in traditional plans.

METHODS

Design and Setting

This double-cohort study used health plan enrollment and claims data from Harvard Pilgrim Health Care, the largest nonprofit health plan in New England. Harvard Pilgrim currently serves >1 million members who receive care in a variety of organizational settings. This study focused on employer-sponsored plans in Massachusetts, including those in which the employer purchased insurance through associations (independent brokers or trade organizations that negotiate contracts with health insurers for small employers).

In March 2002, Harvard Pilgrim began offering HDHPs. During the study period, the family deductibles ranged from \$1000 to \$4000 per year, but the benefit structure was the same across HDHPs. Emergency department visits, diagnostic tests, hospitalizations, hospital outpatient services and day surgery, and therapeutic procedures (eg, physical therapy) were subject to the deductible. Most preventive care services were exempt from the deductible and were covered at no cost; these included immunizations, routine hemoglobin and lead levels, sexually transmitted disease screening, and tuberculosis skin testing. Routine newborn nursery services were also covered at no cost. Office visits (including specialist, mental health, and hospital outpatient clinic visits) and prescription drugs were not part of the deductible but were subject to copayments. A health reimbursement arrangement (an account that can be used for out-of-pocket [OOP] health care expenses) was available but offered by only a small minority of employers. In contrast, traditional health maintenance organization (HMO) plans in Harvard Pilgrim had copayments for emergency department visits, full coverage for preventive care and most diagnostic tests, and limited cost-sharing for hospitalizations; copayments for office visits and prescription drugs were similar to those in the HDHPs. This study was approved by the Harvard Pilgrim Health Care Human Studies Committee.

Population

We identified families whose members all were enrolled in a traditional Harvard Pilgrim HMO for a 12-month baseline period anytime between March 2001 and June 2004; then for a follow-up period of at least another 12 months, these families' employers either (1) switched them to an HDHP HMO or (2) kept them in the same traditional Harvard Pilgrim HMO plan (controls). Families were excluded when (1) there was not a child ≤ 18 years of age in the family, (2) a family member was ≥ 65 years of age and thus eligible for Medicare, or (3) a family member did not have continuous enrollment through the same employer for the baseline and follow-up periods.

We selected all eligible families who were switched to HDHPs and randomly matched them 1:8 with eligible control families on the basis of matched enrollment periods. The date the family switched to an HDHP was assigned as the index date separating the baseline and follow-up periods. Control families were assigned the same index date as their matched HDHP family. Because we were interested in families who did not have a choice of whether to enroll in HDHPs (who comprise 89% of families in HDHPs in Harvard Pilgrim), we selected families who were insured through employers who offered only one health plan (ie, they did not offer a choice of Harvard Pilgrim or other health plans). Employers ranged from small businesses with < 10 employees who purchased a health plan through an association to firms with >1000 employees.

Variables

The primary dependent variable in this study was whether the family was switched to an HDHP or was kept in a traditional HMO after the baseline period. The independent variables in our analyses included demographic, socioeconomic, clinical, and employer variables. Using census block group data from the 2000 US Census linked through the family's geocoded

address, we defined a family's neighborhood (census block group) as high poverty when $\geq 10\%$ of residents had incomes below the federal poverty level¹⁴ and as low education when $\geq 25\%$ of the residents who were ≥ 25 years of age lacked a high school degree.^{14,15}

We used the Johns Hopkins Adjusted Clinical Group System to measure morbidity for each family member by using age, gender, and *International Classification of Diseases, Ninth Revision* diagnosis codes from claims from the 12-month baseline period when all families were in traditional plans.^{16–18} On the basis of a national employed reference population of adults and children, each individual was assigned a morbidity weight that was scaled around an average of 1.0, with higher scores indicating sicker patients.^{16,17,19,20} We calculated the mean morbidity weight across all family members and categorized a family as having above-average morbidity when this mean family score was greater than the standardized average of 1.0.

To identify chronic conditions in adults and children during the baseline period, we used the Chronic Condition Checklist created by researchers at the Johns Hopkins School of Public Health to identify conditions that were expected to last >12 months and have a substantive impact on future health or functional status.²¹ A claim for an *International Classification of Diseases, Ninth Revision* code on the checklist signifies a chronic condition; claims for laboratory and radiology services were excluded to avoid rule-out diagnoses.

We measured health care expenditures by using claims data for all billed services in the baseline period summed across all family members. We determined OOP expenditures from amounts paid as copayments, co-insurance, or deductibles; copayments made up nearly all of the OOP expenditures. Total expenditures were based on the allowed amount payable to the provider, which included the amount paid by the health plan and the patient liability. Approximately 15% of families did not have drug coverage through Harvard Pilgrim; to maintain comparability among subjects, we did not include pharmacy expenditures in calculations of costs. We created dichotomous variables that approximated the top quintile of expenditures for the study population: more than \$450 for OOP expenditures and more than \$7000 for total expenditures.

Employer size data were derived from Harvard Pilgrim market segment classifications, and we categorized families' employers as small (≤ 50 employees) or large (>50 employees). Employer type was categorized by using Standard Industry Classification codes grouped into 10 categories defined by the Department of Labor.²²

Statistical Analyses

We used χ^2 and Wilcoxon rank-sum tests to identify bivariate differences in family characteristics between groups. Among HDHP families, we performed bivariate comparisons of characteristics of families whose employers were small versus large. We tested for differences on the basis of employer size because key informant interviews of parents in HDHPs that were done to inform related studies suggested differences between families with large and small employers. Small business owners reported in key informant interviews that they often chose HDHPs as their company's single plan because they and their employees were relatively healthy and wanted to reduce premium costs. This raised the possibility that families with small employers who chose HDHPs might have lower morbidity than those with large employers because small employers might have more direct knowledge of the preferences of their employees and use these in choosing between HDHPs and traditional plans.

We used multivariate logistic regression to identify family characteristics that were independently associated with being switched to an HDHP versus being kept in a traditional plan. Models were stratified by employer size and included independent variables of interest

a priori: average parent and child age, number of children, neighborhood poverty and education, family morbidity, presence of children or adults with chronic conditions, and baseline total and OOP expenditures.

RESULTS

We identified 839 families with 1598 children and whose employer switched from a traditional plan to an HDHP and matched them to 5133 control families who had 10093 children and whose employer continued to offer only a traditional plan.

Bivariate Analyses

In bivariate analyses among families who were switched to HDHPs, those insured through small employers differed from those with large employers on several characteristics (Table 1). Families with small employers seemed healthier, and families with large employers had significantly greater prevalence of high-risk characteristics. Families with large employers were more likely than those with small employers to live in neighborhoods with high poverty (21.5% vs 10.6%, respectively; $P < .001$) and low education (9.3% vs 3.6%; $P = .003$), have above-average family morbidity (49.3% vs 33.3%; $P < .001$), and have baseline total expenditures of more than \$7000 (27.6% vs 17.6%; $P = .005$).

Families who were switched to HDHPs were more likely to have small employers than those who were kept in traditional plans (Table 2). Of HDHP families, 82% were enrolled through small employers compared with 56% of control families ($P < .001$). Among families with small employers, nearly 80% of both the HDHP and control groups had employers with a Standard Industry Classification code for the service industry, which included business, health, legal, automotive, hotel, and recreation services. Among families with large employers, a little less than half of both the HDHP and control groups had employers in the service industry. Families with large employers in the HDHP group were more likely to work in manufacturing than families with large employers in the traditional plan group (34% vs 14%, respectively) and less likely to work in finance, insurance, and real estate (5% vs 14%) and wholesale trade (3% vs 11%).

Multivariate Analyses

Given confirmation of differences between HDHP families with large and small employers, multivariate analyses comparing the HDHP and control groups were stratified according to employer size (Table 3). Among families with large employers, the adjusted odds of being switched to an HDHP versus being kept in a traditional plan were higher for families living in high-poverty neighborhoods (odds ratio [OR]: 1.78 [95% confidence interval (CI): 1.12–2.83]). Among families with small employers, the adjusted odds of being switched to an HDHP versus being kept in a traditional plan were lower for those with more children (OR: 0.85 [95% CI: 0.77–0.95]), above-average family morbidity (OR: 0.57 [95% CI: 0.46–0.70]), and baseline total expenditures of more than \$7000 (OR: 0.75 [95% CI: 0.59–0.95]); the adjusted odds were higher for those with baseline OOP expenditures of more than \$450 (OR: 1.42 [95% CI: 1.14–1.78]).

DISCUSSION

Clinicians who take care of children need to be aware of families whose health care choices may be affected by high deductibles, particularly those who are at high risk as a result of socioeconomic or clinical factors. This is one of the first studies to examine the characteristics of families with children in HDHPs. We focused on families whose employers chose to offer only one type of health insurance plan. Families with large employers were more likely to be

switched to HDHPs when they lived in lower income neighborhoods. In contrast, families with small employers were more likely to be switched to HDHPs when they were healthier or had fewer children.

Understanding the characteristics of HDHP enrollees who do not have a choice of plans is important. A national survey showed that approximately half of HDHP enrollees did not have a choice of plans,² and 89% of families with children in HDHPs in the Harvard Pilgrim population that we studied did not have a choice of plans. Other studies suggest that families are less well represented among HDHP enrollees with a choice of plans.^{23,24} Employees without a choice of plans may be a higher risk population, because they are more likely to have lower incomes than those with choices.¹³ Our finding of an association between HDHP enrollment and residence in a low-income neighborhood for families with large employers is consistent with data that lower wage workers tend to be offered less generous plans.²⁵ Although offering an HDHP as the only plan may not be common among large employers,^{1, 26} this smaller population seems to be a more vulnerable group.

Our finding among families with small employers that those who were switched to HDHPs were healthier than those who were kept in traditional plans suggests that employer-level selection may exist in HDHP enrollment even when employees are offered no direct choice of coverage. Our data from key informant interviews supports the idea that small business owners may recognize when they have healthy employees and select HDHPs for their businesses as a way to lower premium costs. This raises concern that small employers with sicker families are more likely to choose to remain in traditional plans, which may contribute to increasing per-member costs in such plans.^{27,28} Given that employees in small firms nationally are less likely to have a choice of plans¹ and more likely to be enrolled in HDHPs²⁹ compared with those in large firms, this population merits monitoring. Future studies of HDHPs will need to account for this potential employer-level selection bias, which may make health care use and costs seem lower in HDHPs with many members from small employers.

Despite the seemingly favorable selection of healthier families into HDHPs, however, approximately one third of families in HDHPs from both large and small employers had children with chronic conditions. Pediatric providers and health plans will need to be aware of the insurance coverage of children with chronic conditions to monitor whether the need to pay OOP to meet deductible costs adversely affects use of recommended services.

From a clinician's perspective, it may not be simple to infer which pediatric patients are enrolled in HDHPs. Clinicians who have populations in which many families have small employers or have large employers in manufacturing may be more likely to see children with HDHPs; however, routine information collected in pediatric visits about parental employment may not be enough for providers to determine which families are exposed to high deductibles, and it is still uncommon for patients and physicians to discuss OOP costs during clinical visits.³⁰ As high deductibles and other cost-sharing mechanisms become more prevalent, providers may need to inquire about patients' type of insurance coverage and cost-sharing arrangements when recommending health services, especially those with potentially high costs.

Enrollment in HDHPs may be influenced by factors that our study's claims and enrollment data did not capture, such as family income, education, race/ethnicity, and employee premium; however, we were able to measure neighborhood income and education, which can serve as reasonable proxies for individual-level socioeconomic measures.^{14,15,31} Children who live in low-income neighborhoods might not have families with low incomes, and low-income children are more likely to be enrolled in public insurance programs; however, ~40% of Massachusetts children with family incomes at 100% to 199% of the federal poverty level have private insurance.³² Because our study used data from a single health insurer, our conclusions

may not generalize to HDHPs that are offered by insurers in other areas or HDHPs that include health savings accounts; however, most HDHP enrollees nationally do not have such accounts to pay for OOP costs.^{2,33} We are also unable to determine whether employers of families in HDHPs in our study provided payment for deductible costs outside of formal accounts. Because some families in our study did not have drug coverage, our analyses of baseline expenditures did not include pharmacy expenditures. Although expenditures are likely to be higher when pharmacy expenditures are included, we expect that the relative relationship between baseline expenditures and HDHP enrollment should be similar regardless of whether pharmacy expenditures are included. To test this, we examined mean baseline OOP expenditures for the subset of families with drug coverage and found similar relationships between OOP expenditures and HDHP enrollment regardless of whether pharmacy expenditures were included (data not shown).

CONCLUSIONS

This study of families without a choice of health plans suggests that families in HDHPs likely comprise at least 2 distinct groups: one with higher risk characteristics and another with lower risk characteristics than those in traditional plans. Among families with large employers, HDHP enrollees may have lower incomes than those in traditional plans, whereas HDHP enrollees may be healthier than those in traditional plans among families with small employers. Additional research on the short- and long-term effects of HDHPs is needed to ensure that children and families, especially those with low incomes, receive high-quality health care.

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Abbreviations

HDHP	high-deductible health plan
OOP	out-of-pocket
HMO	health maintenance organization
OR	odds ratio
CI	confidence interval

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TABLE 1

Characteristics of Families Who Switched to HDHPs, According to Employer Size

Characteristic	Small Employer (n = 687) ^a	Large Employer (n = 152) ^b	P
Age of children, mean, y	9.5	9.1	.376
Subscriber age, mean, y	42.9	41.9	.251
No. of children in family, mean	1.9	1.8	.114
High-poverty block group, %	10.6	21.5	<.001
Low-education block group, %	3.6	9.3	.003
Above-average family morbidity, %	33.3	49.3	<.001
Chronic condition in child, %	32.3	40.1	.065
Chronic condition in adult, %	53.3	55.9	.554
Baseline total expenditures >\$7000, %	17.6	27.6	.005
Baseline OOP expenditures >\$450, %	25.0	21.1	.300

^aTwo to 50 employees.^bMore than 50 employees.

TABLE 2
Employer Characteristics for Families in HDHPs and Traditional Plans

Characteristic	HDHP		Traditional Plan	
	% of Families	No. of Employers	% of Families	No. of Employers
Small employers				
Associations (<10 employees)	54.0	<i>a</i>	34.8	<i>a</i>
2–50 employees	27.9	104	21.2	708
Large employers				
51–250 employees	16.2	20	10.3	145
251–999 employees	0.4	1	17.0	50
≥1000 employees	1.6	1	16.7	42

^aThere were 3 associations (independent brokers or trade groups) in the study population. These associations separately contracted with multiple small employers who could offer either an HDHP or a traditional plan to their employees. Data are not available on employers who obtained insurance through the association.

TABLE 3

Multivariate Analyses of Characteristics Associated With Being Switched to an HDHP Versus Staying in a Traditional Plan, Stratified According to Employer Size

Characteristic	OR of Being Switched to HDHP Versus Staying in Traditional Plan (95% CI)	
	Small Employers (<i>n</i> = 3557) ^a	Large Employers (<i>n</i> = 2406) ^b
Mean age of children, y	1.01 (0.99–1.04)	0.99 (0.95–1.03)
Subscriber age, mean, y	1.00 (0.99–1.02)	1.00 (0.97–1.03)
No. of children in family	0.85 (0.77–0.95)	0.81 (0.65–1.02)
High-poverty block group	1.10 (0.82–1.48)	1.78 (1.12–2.83)
Low-education block group	0.70 (0.43–1.12)	0.70 (0.36–1.38)
Above-average family morbidity	0.57 (0.46–0.70)	1.24 (0.83–1.87)
Chronic condition in child	0.93 (0.77–1.12)	1.24 (0.86–1.78)
Chronic condition in adult	1.03 (0.85–1.24)	0.92 (0.64–1.34)
Baseline total expenditures >\$7000	0.75 (0.59–0.95)	1.34 (0.86–2.08)
Baseline OOP expenditures >\$450	1.42 (1.14–1.78)	1.12 (0.69–1.82)

Multivariate models include all variables listed.

^aTwo to 50 employees.

^bMore than 50 employees.