HOW EMPLOYEE EARNINGS ARE ASSOCIATED WITH CDHP PLAN CHOICE

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Abstract

Health Reimbursement Accounts (HRA) and Health Savings Account (HSA) eligible High Deductible Health Plans (HDHP)s emerged as new health care insurance models referred to as Consumer Directed Health Plans (CDHPs) in the early 2000s. The purpose of this study is to examine the association between enrollees' level of earnings and plan choice when a Managed Care PPO, HRA, and HSA eligible HDHP are offered concurrently in an ESI program.

It is important to examine new health insurance structures, such as CDHPs, to better understand their impact on why enrollees' choose one health plan over another. Factors that determine enrollees' plan choice can influence the distribution of socio-economic, health risk, and behavioral characteristics across plans. These factors in turn can affect the financial costs, risk pools, and long-term solvency of such plans. Furthermore, an employer's ability to structure a benefits plan that accommodates the satisfaction, well-being, retention of present employees and ability to attract qualified future employees is key to their long term viability.

Findings suggest enrollees select a plan that minimizes their future financial exposure based on past ESI experiences and the association between CDHP choice and enrollee earnings may not have a simple linear relationship as suggested by prior research.

List of Abbreviations

CDHC = **C**onsumer **D**irected **H**ealth **C**are

CDHP = **C**onsumer **D**irected **H**ealth **P**lan

ESI = **E**mployer **S**ponsored **I**nsurance (group health plan(s) offered to employees by their employer)

HDHP = **H**igh **D**eductible **H**ealth **P**lan (plan associated with CDHPs)

HRA = **H**ealth **R**eimbursement **A**ccount (type of CDHP with employer funded Personal Care Account)

HSA = **H**ealth **S**avings **A**ccount (type of Personal Care Account associated with CDHPs)

FSA = **F**lexible **S**pending **A**ccount (pre-tax savings account for out of pocket medical costs)

Introduction

More than a decade after the introduction of Consumer Directed Health Plans (CDHPs) a dearth of research persists related to CDHP choice, which is partly owed to the fact that researchers must rely on gaining access to private data sources in an environment steeped with concerns of confidentiality and competitive advantage among private insurers. Research suggests that earnings have a positive association with CDHP enrollment. This paper examines if lowest and highest earners are associated with CDHP choice differently than other employees, and offers additional evidence related to favorable selection and who chooses a CDHP.

The focus of this paper is the association between employee earnings and plan choice. Although research examines the association between earnings and CDHP choice, it assumes a simple linear relationship, which may not be the case. This paper presents new evidence that suggests the relationship between earnings and CDHP enrollment may be non-linear. The setting of this study includes plan choice between Managed Care and CDHPs for a national employer's Employer Sponsored Insurance (ESI) program. The ESI program's choice set includes a Managed Care PPO, Health Reimbursement Account (HRA) plan, and Health Savings Account (HSA) eligible High Deductible Health Plan (HDHP). The plans were offered concurrently to all households in the study population.

Understanding the association between employee earnings and plan choice when Managed Care and high deductible CDHPs comprise the choice set is important due to the impact these differing types of plans can have relative to enrollees' ability to access and use health care. Primary subscriber earnings, household out-of-pocket spending, household health status, prior household Flexible Spending Account (FSA) participation, household demographics and plan cost characteristics are included in the analyses.

Background

Any change in health insurance structure is important to examine due possible impacts on why enrollees choose one health plan over another. Factors that determine enrollees' plan choice can influence the distribution of socio-economic, health risk, and behavioral characteristics across plans. These factors in turn can affect the financial costs, risk pools, and long-term solvency of such plans.

To compound concerns, many enrollees have little or no choice in the decision to switch plans. In 2012, nearly 67 percent of all enrollees who changed plans, did so due to employer-initiated changes to the plans offered in their ESI program. Approximately 56 percent of the US population is insured through Employer Sponsored Insurance (ESI) (Kaiser Family Foundation and Health Research And Educational Trust, 2012). Of that 56 percent, CDHP enrollment has grown from 4 percent in 2006 to 19 percent in 2012, with 31 percent of employers offering at least one CDHP plan (Kaiser Family Foundation and Health Research And Educational Trust, 2012).

Driven by escalating ESI costs related to rising health care expenditures, the development of CDHPs represents one of the first large scale efforts to design health insurance plans around enrollee demand cost controls, and is intended to reduce or slow the rate of growth for ESI costs through consumers' engagement in health care decision-making (Green et al., 2006; Robinson, 2002). CDHP design emphasizes cost sharing as the primary tool to engage enrollees, but cost and quality information are also made available to encourage enrollees to make effective and efficient health care purchase decisions.

Although broader generalizations include many forms of High Deductible Health Plans (HDHPs) in earlier literature, HRA and HSA eligible plans have become the two primary health

plan types that have emerged to hold the moniker of CDHP. The term HRA became common to describe the structure and guidelines for medical spending accounts paired with HDHPs that originated as part of the Health Insurance Portability and Accountability Act Medical savings Account (MSA) pilot program developed in 1996. The employer and/or employee funds these accounts with pre-tax dollars intended to pay for some out-of-pocket health care costs typically associated with high deductible plans. Although the MSA pilot expired and medical savings medical savings accounts were no longer formally recognized by the IRS, some insurers continued to offer an MSA styled plan that became known as an HRA. These arrangements were eventually sanctioned by an IRS ruling on June 26, 2002 that stated employers are permitted to fund HRAs on a tax-free basis, employees can use account funds for out-of-pocket health care costs, unused funds can be carried over from year to year (also tax-free), and employers may permit employees to use remaining HRA funds if they change employers or retire (Neurath, 2002).[5] Employers pre-determine HRA funding level allowances each year and have some control over benefit payments, and for what services employees may use the funds. HRAs are most commonly accompanied by a HDHP, but there is no requirement

Health Savings Accounts (HSAs) were established as part of Medicare legislation passed in 2003. With the Medicare Prescription Drug, Improvement, and Modernization Act of 2003, HSAs became the most recent type of medical spending account (*Medicare Prescription Drug, Improvement, and Modernization Act of 2003*, 2003). HSAs introduced employee ownership of medical spending accounts via account portability, investment characteristics, and greater employee control of account use. As with other medical spending accounts, restrictions remain for HSAs. HSAs have annual contribution limits, must be complemented by a HDHP with a minimum deductible, and have a maximum out-of- pocket expense. Table 1 compares and

Table 1

Key Features of Health Savings Account & Health Reimbursement Accounts

Feature	HSA	HRA
Who can fund:	Employee and/or employer	Employer
Portability:	Account follows employee	Employer decides, usually absorbed by employer
Account ownership:	Employee, and can bequeath account upon employee death	Employer
Required plan:	HDHP – as of 2013: Individual Minimum Deductible of $1,250, Individual Maximum Out-of-Pocket of $6,250, Family Minimum Deductible of $2,500, Family Maximum Out-of-Pocket of $12,500	None
Yearly contributions:	Individual Maximum Contribution of $3,250, Family Maximum Contribution of $6,450	Employer discretion no Federal limits
Tax advantages:	Employee can deduct contributions. Employer contributions are deducted from company gross income	Employer contributions are deducted from gross income
Rollover of unused Funds:	Yes	Yes, but employer can absorb upon retirement or end of Employment
Non-medical use:	Allowed, but taxed as income plus 20% penalty	Not permitted

Sources: (Buntin, et al., 2006; HSAFinder, 2013)

contrasts the features of HSAs and HRAs. HRAs are similar to HSAs but are not owned by employees and do not required coupling with a high-deductible plan (Buntin, Damberg, Haviland, Kapur, Lurie, McDevitt & Marquis, 2006). The ownership and portability feature of HSAs make them an attractive health care related investment tool with incentives to accumulate funds for future use; they are the first true enrollee-owned medical savings account.

Prior Research

The focus of Managed Care verses CDHP choice research is on earnings, the health of enrollees, and socio-demographic characteristics which are factors related to financial costs, risk

pools, and long-term solvency of such plans (Barry et al., 2008; U.S. Department of Health & Human Services, 2009; Fowles et al., 2004; GAO, 2006; Greene, Hibbard, Dixon, & Tusler, 2006; Lo Sasso et al., 2004; Parente et al., 2004a, 2004b, 2008; Tollen et al., 2004). However, a literature review of CDHP choice research by Buntin, et al. (2006) suggests there are few studies, generalizability of these is limited by single employer study populations, comparison is difficult due to heterogeneous CDHC and traditional plans across studies, there is a lack of data to control for exogenous effects, and insufficient data is available to identify effects for vulnerable populations.

Although a dearth of evidence persists, early studies do identify some consistency across factors relative to plan choice. Research consistently finds earnings to be positively associated with CDHC enrollment (Barry et al., 2008; U.S. Department of Health & Human Services, 2009; U.S. General Accountability Office, 2006; Lo Sasso et al., 2004; Parente et al., 2004a, 2004b, 2008; Tollen et al., 2004). A positive association between earnings and CDHP enrollment may signify favorable selection or indicate different levels of financial risk tolerance across socio-economic groups. Higher earnings sometimes suggest favorable selection because individuals in higher socio-economic groups are generally healthier and require fewer health care services than those in lower socio-economic groups (Bloche, 2007; Hughes-Cromwick, Root, & Reohrig, 2007; Marquis & Kapur, 2005; Zaslavsky & Epstein, 2005). Alternatively, households with higher earnings may have a higher risk tolerance or premium cost elasticity. This means they are less financially vulnerable if they require medical care and incur greater out-of-pocket cost sharing, and thus place greater value on premium cost (Callan & Johnson, 2002; Parente et al., 2008). Households with higher earnings may choose the lowest costs up front (in the form of premium contributions) with less regard to breadth of coverage or utilization related out-of-

pocket costs, because they are willing to risk that they will not need medical care (Tollen et al., 2004). If they require medical care in the future, they would not be financially devastated by out-of-pocket costs associated with health care utilization not paid by less generous coverage (Christianson, Parente, & Feldman, 2004). An additional issue related to risk tolerance is that those in higher socio-economic groups have greater disposable income to fund a medical savings account (Cardon & Showalter, 2007). Finally, a positive association between CDHPs and earnings may suggest that high earners are more likely to possess greater formal education and relative work experience, which increases their ability and willingness to engage in complex health care use decisions represented by CDHPs.

Closely related to enrollee earnings is plan premium cost. Research finds lower plan premiums are associated with plan choice (Barry et al., 2008; Fowles et al., 2004; Parente et al., 2004a, 2004b, 2008). The same studies also find a positive association between CDHPs and enrollee earnings. Thus evidence supports a relationship between lower premiums, higher earners, and CDHPs. When considered relative to premium elasticity, these findings could be viewed as inconsistent. One would expect lower earners to be most sensitive to premium costs, and CDHPs generally have lower premiums than Managed Care plans. One possible explanation is that the risk of high initial cost sharing featured in most CDHPs may be more critical to lower earners than premiums that are sunk costs after plan selection. A second possible explanation may suggest an unresolved inconsistency across findings between earnings and CDHP enrollment in the research. CDHPs are positively associated with earnings. CDHPs are also positively associated with enrollees who demonstrate greater premium elasticity. However, research generally finds premium elasticity of demand is insignificant for very high-earning consumers (Liu & Chollet, 2006). Thus, findings do not address the possibility that the

relationship between earnings and CDHP enrollment is non-linear, for which a positive association between earnings and CDHP choice does not hold for very low or very high earners. Earnings may have a positive association with CDHP enrollment for the larger ESI population, but very low-earners may have high premium elasticity and seek the lowest premium plans and very high-earners may seek higher premium Managed Care plans with more generous benefits because they have lower premium elasticity.

Much of the research that examines earnings and CDHP choice also examines health status. Multiple measures of health status find healthier enrollees are more likely to choose a CDHP, which suggests these plans enjoy favorable selection (Barry et al., 2008; Fowles et al., 2004; Greene et al., 2006; Parente et al., 2004a, 2004b, 2008; Tollen et al., 2004). If favorable selection exists, CDHPs would attract healthier enrollees who use less care and the less healthy would migrate to the more generous Managed Care plans. This favorable selection for CDHPs would cause an imbalanced risk pool and eventual failure of non-CDHPs. Findings related to health status or health risk across all research examined suggest high deductible CDHPs enjoy favorable selection.

Due to some basic similarities between HRAs and HSAs with Flexible Spending Accounts (FSAs), Parente et al., (2004a) examine the association between prior participation in a Flexible Savings Account (FSA) and CDHP enrollment. Albeit with numerous restrictions on funding, accrual of funds, and use, FSAs allow enrollees to finance some initial out-of-pocket medical costs with pre-tax contributions via an early form of medical savings accounts used in tandem with their health plan. Prior FSA participation may suggests a basic level of enrollee engagement based on their choice to finance and manage some preliminary health care costs via a medical savings account. FSA participation requires some basic planning characteristics for the

financing and coordination of future medical care similar to that required by CDHP plan design mechanisms, such as medical savings accounts. Parente et al. (2004b) find enrollees who had previously funded an FSA were more likely to enroll in a CDHP.

In addition to earnings, health status and prior FSA participation, research examines who chooses a CDHP via socio-demographic variables. Socio-demographics attempt to capture the influence that social and individual characteristics can have on plan choice (Kronick, et al., 1996; Lee & Rogal, 1997; Tollen et al., 2004; Wison, et al., 1998). Research generally finds males, younger enrollees, and Caucasians to be associated with high deductible CDHP enrollment (Barry et al., 2008; Fowles et al., 2004; GAO, 2006; Green et al., 2006; U.S. Department of Health and Human Services, 2007; Parente et al., 2008; Tollen et al., 2001). Additionally, research suggests CDHP enrollees are more likely to have single subscriber coverage than Managed Care enrollees, which may be associated with enrollee expectations of future healthcare costs. Single subscribers may perceive CDHPs to represent lower risks for future out of pocket costs than multiple enrollee households where the scale of future health care needs can be less predictable. Finally, CDHPs are found to be positively associated with exempt employees. This can be considered consistent the association found between CDHPs and higher earners and better health. Exempt status is a measure often used to represent higher earnings, education and better health.

Setting

This study is based on a single large self-insured employer's ESI enrollee population. The data source is a regulated publicly traded holding company with assets of approximately forty billion dollars. It employs about 20,000 persons in East North Central, South Atlantic, East South Central, and West South Central United States. The workforce is comprised of salaried and

hourly (exempt and non-exempt) positions including administrative, technical, skilled trades and non-skilled laborers (union and non-union), various levels of management, and professional generalists.

Nearly all employees are enrolled in the ESI program that extends coverage to eligible dependents, which increases the total number of covered lives to approximately 31,000.[1] Persons eligible for ESI benefits include employees who work a minimum average of 40 hours per week, and part time employees who are scheduled to work an average of 20 hours per week. Eligible dependents include an employee's spouse, domestic partner, unmarried children up to age 19, unmarried children between the ages of 19 and 25 if a full time student in a college or university, unmarried disabled children of any age (onset prior to age 19 or 25), and unmarried children of domestic partners with similar parameters as with traditional heterosexual marital relationships.

Plan offerings changed from 2005 to 2006 allowing for a natural experiment in plan choice. In 2005 the company offered ten ESI plans including six HMOs, three PPOs, and one HSA eligible high deductible health plan (HDHP). Effective January 1, 2006, four HMOs and a PPO offered in 2005 were eliminated, and an HRA was added. Thus, six plans were offered in 2006: two HMOs, two PPOs, and two CDHC plans.[2] However, the HMOs and one PPO were only offered in limited "carved out" geographic regions to compensate for weak provider networks of the other health plans.[25] Those regions are not included in the study data.

The study population is predominantly male (82%), married (79%) (second most single 12.3%), white (86%) (second most common ethnicities are Hispanic and African American 6% each), hourly or non-exempt (60%), non-union (71%,), and reside in the East North Central part of the United States (48%) (second most residing in the West South Central 27% and third in the South Atlantic 20% regions). Of the 9,617 households in the study 58% chose the PPO, 37%

chose the HRA, and 5% chose the HSA eligible CDHP (Appendix A – Variable Frequencies). Coverage tiers within each health plan do not reflect any significant differences when compared to all plans in the study. The PPO has fewer single coverage enrollees, and the HSA eligible CDHP has fewer households enrolled as employee plus children and family. Finally, 18% funded an FSA in 2005 prior to the plan choice for 2006. The mean age for employees shows a mature workforce at nearly 50 years old with a median of 51 (Appendix B – All Enrollees' Descriptive Statistics). The average number of enrollment months is 35 with a median of 36 suggesting the average household had roughly 3 persons enrolled for full year policy periods. Average earnings for employees is $69,615 with a median of $66,181; average variable cost sharing for 2005 were $1,470 with a median of $995.

Employees in the three plans share similar mean ages (Appendix C – Descriptive Statistics by Plan). The PPO enrollees do appear to have greater variable cost sharing and higher RRS, which suggests poorer health on average compared to the other two plans. The HSA eligible CDHP enrollees had the lowest RRS and FSA contributions, which suggests they are healthier on average and had set fewer funds aside in a tax deferred FSA for out-of-pocket costs than the other two plans. Thus, the utilization and distribution characteristics of various types of health insurance plans across the employee population suggests that the PPO appears to attract less healthy enrollees and those earning less than the CDHPs.

Plan cost characteristics, including plan premium contributions by enrollees, deductible, co-insurance rate, and annual out-of-pocket maximum, are listed in Table 1. The HSA eligible HDHP is a free option for employees. The HRA is the second least costly option for single and family coverage. The highest enrollee cost is for the PPO. Each plan's deductible is also based on coverage tier. However, the deductible for the HRA is applied differently from the other

Table 1

Health Plan Cost Structures

Coverage Tier: (S) = Subscriber, (SS) = S & spouse, (SC) = S & Child, (F) = Family			
Plan	PPO [a]	HRA	HDHP [b]
Employee Premium Contribution (per month)	$77.77 S $165.24 SS $130.03 SC $217.50 F	$63.07 S $134.01 SS $105.46 SC $176.39 F	$0 S $0 SS $0 SC $0 F
Deductible In- Network	$0	After HRA Exhausted $500 / S $750 / SS $750 / SChild(ren) $1,000 / F (In & Outside Network)	$2,100 / per enrollee [c] up to $6,300 / F
Outside Network	$300 / S $900 / F		$2,500 / S $7,500 / F
Co-insurance [c] Inside Network Outside Network	15% 30%	15% 30%	0% 20%
Out-of-Pocket Maximum In- Network	$2,000 / per enrollee [d] up to $6000 / F	$3,000 / S $4,500 / SS $4,500 / SChild(ren) $6,000 / F	$2,100 / per enrollee [d] up to $6,300 / F
Outside Network	$4,000 / SS $12,000 / F	$5,500 / S $8,250 / SS $8,250 / SChild(ren) $11,000 / F	$5,000 / SS $15,000 / F
Employer Contributions to medical savings account	$0	$1,000 / S $1,500 / SS $1,500 / SChild(ren) $2,000 / F * Used prior to deductible	$0

Notes.

[a] *The PPO plan also has co-pays for Primary Care Physician Visit = $20, Specialist Visit = $25, Emergency Department Visit = $50, Chiropractic Visit = $25.*

[b] *The HDHP has a cost structure that does not change based on funding or not funding an HSA.*

[c] *Co-insurance percentages are applicable after deductibles are met.*

[d] *Up to the family level. The enrollee deductible is taken up to three enrollees.*

plans. The HRA deductible is in effect after the HRA personal care account funds are exhausted (e.g. if a single subscriber's HRA account balance is $3,000, the deductible of $500 would be in effect after $3,000 of medical care has been paid from the HRA funds by the enrollee). The

employer contributes the HRA funds. Thus funds used prior to the HRA deductible are not out-of-pocket for enrollees. Each plan specifies two deductibles per coverage tier, one for in-network and another for out-of-network provider care. Co-insurance Rate is a percentage of medical costs enrollees are required to pay to the provider for medical care after the plan's deductible is satisfied. Each plan specifies two co-insurance rates, one for in-network and another for out-of-network provider care. Annual Out-of-Pocket Maximum is also based on coverage tier. Each plan specifies two values per coverage tier, one for in-network and another for out-of-network provider care.

Methods

A cross sectional non-experimental ex post facto design was used to examine data from a single large employer in four regions of the United States. The dependent variable is plan choice. Analysis is at the contract level, which includes all enrollees covered under a primary subscriber's (employee's) ESI policy, because household members influence plan choice as either direct decision-making participants or through collective past experience and personal characteristics (Hawley, et al., 2009).

The study data are retrieved from two data sets, one from the employer's human resources information system (HRIS) and a second from a health insurance claims system via a data management firm that is contracted by the employer's insurance broker for managing the ESI data.[3] In order that policy and claims data could be available for analyses under the Health Insurance Portability and Accountability Act of 1996 (HIPAA), an independent third party was used to collect and remove all personal health identifiers.[4] Data was available for one full year prior to the enrollment choice for the policy year of 2006.

Enrollment choices for plans with medical savings accounts may be affected by short-term verses long-term enrollment expectations when they include placing funds aside for future health care needs. HRAs and HSAs allow unused funds to accumulate. If an employee expects to leave the employer, he/she would be less likely to fund an HSA. Additionally, short-term enrollees are more likely to use all employer funded HRA money, and not roll unused funds over to the next enrollment period. Thus, only full-time employees and their covered household members who were continuously enrolled in the study employer's ESI program from January 1, 2005 to December 31, 2009 are included in the study. Employees aged 60 years or greater were excluded from the study. Employees greater than 60 years of age will become eligible for Medicare at age 65 and, their decisions on health plan choice would be influenced by the potential of their coming retirement or Medicare coverage. Additionally, employees living in some geographic areas are not included in the study sample. Based on provider network weakness in certain geographic areas of the three primary plans available, the employer offered additional plans in limited "carved out" geographic areas. The study only includes enrollees who were offered the same three primary plan choices nationally for 2006: PPO, HRA, and HSA eligible HDHP. Data are not available for employees that were not enrolled in the employers ESI program.

A conceptual model adapted from Ronald Andersen's behavioral model guides this study to examine ESI choice, which determines how health care is accessed and used. Andersen's model emphasizes the importance of individuals' characteristics that affect the means and manner health care is accessed and used, their need for health care, their possessing the necessary resources to access and use health care services, and the prominent role of third party insurance coverage such as ESI (Andersen, 1995). Where Andersen's full theoretical model was

designed to predict overall health care access and use, an adaptation that concentrates on perceived need, enabling resources, predisposing characteristics and plan characteristics guided the study. Where the Behavioral Model uses these constructs to examine health care access and use, these same concepts are adapted to examine the choice between Managed Care and CDHPs as an outcome that determines how health care is accessed and used. Other studies have explored CDHC plan choice with similar theoretical frameworks. Fowles et al. (2004) and Green, et al., (2006) suggest plan choice is a product of four domains similar to the behavioral model (socio-demographic characteristics, health status, utilization, and plan characteristics). Parente et al. (2004a, 2008) use a model of utility maximization and emphasize economic tradeoffs between enrollee resources and plan characteristics. These studies suggest predisposing characteristics, health care need, prior use, and enabling resources and cost, as described by Andersen, play a significant role in plan choice (Andersen, 1995; Fowles et al., 2004; Greene et al., 2006; Parente et al., 2004a, 2008).

Earnings are identified as a key economic enabling resource in the literature, but this study expands the analysis to contrast enrollees with the highest and lowest earnings with the larger mean earner population. Highest and lowest earners are defined as those whose earnings are in the top and bottom ten percent of the study population. Ten percent was chosen because a split between categories for dichotomous variables should not be greater than 90-10 due to the potential for truncated correlation coefficients between variables and the greater influence of the scores in the smaller category (Tabachnick & Fidell, 2001). Real median national income for 2005 was $46,326 with a mean of $60,999, and the top 10 percent of households earned greater than $118,000 (Webster & Bishaw, 2006). Median employee earnings for the study population is slightly higher compared to the national figures at $66,181 with a mean of $69,615. The top 10%

of the study population earned between $98,679 and $1,034,415 with a median of $113,445. The bottom ten percent of employee earners in the study range from $7,994 to $37,249. The bottom twenty five percent of United States households in 2005 earned between $0 - $22,500, thus it should be noted that the range of earners for the bottom 10% of the employer study group is substantially above a similar range of earners for the U.S. population as a whole (US Department of Labor, 2006).

Analytical Approach

Bivariate relationships between independent variables and each plan chosen are examined first. Then, multinomial logistic regression is used to estimate the plan choice model, which includes a trichotomous dependent variable for which the two CDHPs are examined as separate and distinct options (PPO, HRA, or HSA eligible HDHP). Multinomial logit regression is used because discrete nominal dependent variable responses are analyzed simultaneously. Multinomial logistic models require a dependent variable reference category to be chosen. The reference category is used to compare odds ratios of non-reference categories against the reference group. In this study, the reference category is the Managed Care PPO plan, because it includes the most cases and CDHP choice is examined relative to Managed Care.

Findings

Bivariate variable relationships between IVs and each plan are examined for statistical significance via the Pearson Correlation coefficient. This is conducted for the five continuous IVs with each plan (Table 2). The Phi coefficient is used to assess the bivariate relationships for dichotomous IVs and each plan, and Cramer's V for the remaining multiple category nominal IVs with each plan.

Table 2

Bivariate Relationships

Variable	PPO Managed Care Plan	HRA	HSA eligible CDHP
Employee Earnings [a]	-.038 **	.024 *	.033 **
Total Cost Sharing [a]	.076 **	-.047 **	-.070 **
No Prior FSA Participation [d]	-.011	.022 *	-.025 *
Relative Risk Score [a]	.153 **	-.136 **	-.047 **
Member Months [a]	-.008	-.014	.051 **
Salaried (non-hourly) [d]	-.102 **	.065 **	.090 **
Non-Union [d]	-.054 **	.035 **	.045 **
Out-of-Pocket Maximum [a]	.040 **	.064 **	.053 **
Ethnicity [e]	.062 **	.064 **	.061 **
Marital Status [e]	.073 **	.062 **	.041 **
Region [e]	.161 **	.139 **	.074 **

Notes.
[a] Pearson coefficient used to test bivariate relationship for continuous and dichotomous IVs.
[d] Phi coefficient used to test bivariate relationship for two dichotomous IVs.
[e] Cramer's V coefficient used to test bivariate relationship for dichotomous and nominal IVs
* Correlation between the DV and IV is significant at the 0.05 level (2-tailed).
** Correlation between the DV and IV is significant at the 0.01 level (2-tailed).

The relationship between employee earnings and the plan chosen for 2006 is statistically significant for each plan. Employee earnings have a negative association with PPO Managed Care plan enrollment and a positive association for the two CDHPs (HRA and HSA eligible CDHP). Total cost sharing is statistically significant for each plan. It has a negative association with the CDHPs and a positive relationship with PPO Managed Care plan enrollment. No prior participation in an FSA has a statistically significant negative association with HSA eligible CDHP enrollment, and a positive association with HRA choice. Those who chose to enroll in the HSA eligible CDHP, which does not require a funded health savings account, were more likely to fund an FSA, but those who chose the HRA and are required to manage the HRA medical account are less likely to have previously funding an FSA. Enrollment in the PPO and FSA is not statistically significant.

Relative Risk Score is similar to total cost sharing as it is statistically significant for all plans and has a negative association with the CDHPs, but positive with PPO Managed Care plan enrollment. This coupled with the total cost sharing results suggests CDHPs may enjoy favorable selection. Member months are positively associated with HSA eligible CDHP enrollment, which suggests as the household size increases (member months represents household size) employees are more likely to enroll in a HSA eligible CDHP. PPO Managed Care plan enrollees are more likely to be union members and hourly employees, while CDHP enrollees are more likely to be salaried and non-union. Out-of-pocket maximum is statistically significant for all plans and is positively associated with each. Ethnicity, Marital status and region are statistically significant for all plans.

In the multinomial analysis, employee earnings was operationalized to represent membership (or not) in the top ten percent of earners, the bottom ten percent of earners, or the middle eighty percent of earners. The analysis is to examine if a positive association exists between CDHP choice and employee earnings, as suggested by prior studies. Membership in the top 10% of earners is statistically significant for the HSA eligible CDHP, but not for the HRA (Table 3). The top ten percent of earners are approximately 1.7 times more likely to choose the HSA eligible CDHP over the PPO Managed Care plan. There is no support for the highest earners to choose the PPO Managed Care plan over the HRA as it is not statistically significant. Membership in the lowest 10% of earners is statistically significant for the HRA, but not for the HSA eligible CDHP. Earners in the lowest ten percent are approximately 1.5 times more likely to choose the HRA over the PPO Managed Care plan. The HSA eligible CDHP is not found to be statistically significant relative to the lowest earners. Employee earnings, comprised of only "middle" earners (80% of the study population) for this model is not statistically significant for

Table 3

Parameter Estimates (n=9,617)

Plan Chosen 2006 (DV)	Independent Variable	B	Std. Error	Wald	Sig.	Exp(B)
HSA eligible CDHP[a]	Top 10% EE	.522[b]	.154	11.483	.001	1.685
	Bottom 10% EE	-.197	.214	.847	.358	.821
	Middle 80% EE	.000	.000	.157	.692	1.000
	Prior Total Cost Sharing	-.001	.000	263.774	.000**	.999
	FSA Participation: No	.445	.153	8.400	.004*	1.560
	FSA Participation: Yes	0[b]	.	.	.	.
	Relative Risk Score -RRS	.002	.001	8.572	.003**	1.002
HRA[a]	Top 10% EE	.147	.080	3.373	.066	1.158
	Bottom 10% EE	.401[b]	.079	25.790	.000	1.493
	Middle 80% EE	.000	.000	2.149	.143	1.000
	Prior Total Cost Sharing	.000	.000	28.512	.000**	1.000
	FSA Participation: No	.011	.062	.030	.863	1.011
	FSA Participation: Yes	0[b]	.	.	.	.
	Relative Risk Score -RRS	-.003	.000	70.305	.000**	.997

Notes:
[a]The reference category is: PPO.
[b]This parameter is set to zero because it is redundant.
*Parameter is significant at the 0.05 level (2-tailed).
**Parameter is significant at the 0.01 level (2-tailed).

either plan relative to the PPO Managed Care Plan.

Other variables examined included Prior Total Cost Sharing, Prior FSA Participation and Relative Risk Score. Each measure was at the policy level for each primary subscriber household. Prior Total Cost Sharing was calculated as: *Variable Cost Sharing$_{2005}$ (Allowed Provider Charges$_{2005}$ - Net Provider Charges$_{2005}$) + Fixed Cost Sharing$_{2005}$ (Employee Premium Contributions$_{2005}$)*. Allowed provider charges are the amounts owed to providers after insurance plan contracted rates are applied. Net provider charges are the amounts due by the enrollee after the

plan pays the amount due under the policy, but does not include deductibles, co-insurance or co-pays. Prior FSA Participation measures if the enrollee household funded an FSA account in the year prior to choosing between CDHPs and Managed Care Plan. Relative Risk Score (RRS) is a weighted score created by using demographic categorization and Diagnostic Cost Grouping (DCG) captured from health care use for every enrollee under each primary subscriber contract, and compared to the mean score for the total ESI contract population. DCG is a proprietary algorithm based diagnosis cost grouping software developed by Verisk Health Inc. and employed by the data management firm.[5] The RRS incorporates age, gender, and Diagnosis Cost Groups (DCGs) based on past medical claims history of clinical hierarchies and interactions. Enrollees with no claims history are assigned a minimum score based on age, gender, and ESI population averages that contributes to the overall contract level RRS.

Multivariate findings for Prior Total Cost Sharing, RRS, and Prior FSA Participation produce mixed results relative to bivariate findings. Enrollee households that choose the HSA eligible CDHP are positively associated with slightly lower Prior Total Cost Sharing (B coefficient = -.001), however are also associated with a higher RRS which represents poorer health (B coefficient = .002). In contrast, enrollees who choose the HRA versus the PPO Managed Care plan had a slight effect that indicates they are positively associated with greater Prior Total Cost Sharing (B coefficient = .000), but also associated with better health as represented by a lower RRS (B coefficient = -.003).

If an enrollee household previously participated in an FSA they are approximately 1.6 times less likely to choose the HSA eligible CDHP over the PPO. Prior participation in an FSA is not statistically significant for enrollment in the HRA versus the PPO Managed Care plan.

Discussion

Prior findings of a positive association between earnings and CDHP enrollment are only partly supported by this study. This study finds a positive association between the highest 10 percent of earners and the HSA eligible HDHP. However, no significant association is found between the HRA and earnings for this group. Additionally, enrollees who are in the lowest 10 percent of earners are more likely to choose the HRA than the PPO Managed Care plan, but the HSA eligible CDHP is not found to be statistically significant. Finally, earnings are not significant for enrollees in the middle 80 percent of the study population.

Where prior research finds a positive linear association between earnings and CDHP choice, this research does not, in the broader sense. Taken in total, results find lowest earners are associated with choosing one form of CDHP (the HRA), and highest earners are associated with choosing a different type of CDHP (the HSA eligible HDHP). Furthermore, when CDHP choice is examined for enrollees in the middle 80 percent earner group, no statistically significant association is found between earnings relative to CDHPs versus Managed Care plan choice. Prior research treats all CDHPs as a homogenous choice among plans in their plan choice estimations, while in fact studies also acknowledge the many forms of CDHPs with distinctly differing cost structures and characteristics in the literature.

Results may suggest that low-earning employees seek the lower premium cost of the HRA versus the PPO Managed Care plan. Albeit, the HSA eligible HDHP has the lowest premium cost to enrollees, but also has a high deductible that must be funded entirely by the enrollee(s) if they incur medical costs, whereas the HRA's high deductible is partly offset by the employer funded spending account. This suggests enrollees may not want to risk the larger initial cost sharing that they perceive the HSA eligible HDHP to have due to the high deductible. They may also perceive their

need for health care to be minimal and take the chance their costs, if any, will be covered by the employer-funded HRA account. Premium contributions are markedly higher for the HRA than the HDHP, but the risk and uncertainty of incurring costs under a high deductible HDHP may be unattractive. Furthermore enrollees may lack the disposable income to self-fund the HSA to help offset costs in the HDHP. Qualitative findings by Green, et al. (2006) support these possible explanations. As in this study, Green, et al.'s (2006) research included a similar choice between lower and higher deductible CDHPs. They found enrollees who chose the higher deductible CDHP did not expect to need care and preferred a plan with low premiums. Those who chose the lower deductible HRA did so because its premiums were cheaper than the Managed Care option, but they expected the employer funded account to greatly assist with minimizing their risk of out-of-pocket costs (Green, et al. 2006).

Results for those in the middle-earners group do not support prior research that finds a positive association between earnings and CDHP choice (Barry et al., 2008; Lo Sasso et al., 2004; Parente et al., 2004a, 2004b, 2008; Tollen et al., 2004; U.S. Department of Health & Human Services, 2009; U.S. Government Accountability Office, 2006). However, the one study with similar choices across plan characteristics and study population finds earnings and CDHC choice not significant as in this study (Green et al., 2006). This study suggests the individual plan characteristics are more critical than the moniker of CDHP assigned to HRAs and HSA eligible HDHPs relative to the association between earnings and plan choice.

Of interest related to Prior Total Cost Sharing and RRS, is the slight divergence between these two measures' findings for the CDHPs. Greater medical spending is generally associated with poorer health based on enrollees fulfillment of their need for care. Poorer health generally is manifested in greater medical spending. This study identifies a small effect in which those who

choose the HSA eligible HDHP are more likely to spend less out-of-pocket on care in the year prior to enrolling in the plan have a greater Relative Risk Score (poorer health). Alternatively, there is a similar opposite effect in the prior year for those who choose the HRA plan. Enrollee health behavior characteristics may help explain such a finding. One possible explanation is that those who choose the HRA are more predisposed to seek some minimum level of care to maintain better health. Alternatively those who choose the HSA eligible HDHP are more inclined to avoid care, to avoid incurring out-of-pocket costs, and suffer slightly poorer health. This study supports concerns that HDHP enrollees will elect to avoid necessary care to avoid the associated out-of-pocket costs during the high deductible gap in coverage. It is important to conduct longitudinal research to assess if there is any long-term health status change due to care seeking behaviors influenced by out-of-pocket costs associated with HDHPs.

Finally, this study does not support findings by Parente, et al. (2004a) that Prior FSA Participation is associated with CDHP choice. In fact, this study finds a negative association between the HSA eligible HDHP and Prior FSA Participation and no significant association for the HRA. These results may suggest that enrollees do not choose CDHPs due to a continued ability to use a medical spending account. As suggested by other studies, enrollee premium cost, plan generosity levels and moral hazard may primarily drive plan choice decisions (Barry et al., 2008; Green et al., 2006; Parente et al., 2004a; Parente et al., 2008). Furthermore, prior FSA participants may have found the medical spending accounts unattractive to both fund and to manage with administrative and planning complexities. Although Parente et al. (2004b) find a positive association between prior FSA participation and CDHP enrollment, results may differ due to the choice set in their study that included two Managed Care plans and an HRA as well as less than one percent enrollment in the

CDHP option. This study and Parente et al. (2004b) have different study populations and the incongruent results may highlight the importance of generalizability when examining plan choice.

Endnotes

1. The nearly 20,000 employees in the health benefit program do not include retiree plans.

2. For 2006 employees were offered one of the two PPOs. One PPO was the primary option, but for employees who lived in areas where the primary PPO had weak provider networks, an optional out-of-network access PPO plan was made available in place of the primary PPO plan. The HMO was offered in part of one East North Central state for 2006 based on health system strength and the employer accommodating employee requests.

3. The employer uses PeopleSoft® for their HRIS.

4. "Health Insurance Portability and Accountability Act of 1996… establish(ed) regulations for the use and disclosure of Protected Health Information…(e.g.) health status, provision of health care, or payment for health care that can be linked to an individual". http://en.wikipedia.org/wiki/Health_Insurance_Portability_and_Accountability_Act

5. Verisk Health Inc. DCG software is also used by the Center for Medicare and Medicaid Services uses the same for analyses of the Medicare Choice Program.

Bibliography

Barry, C. L., Cullen, M. R., Galusha, D., Slade, M. D., & Busch, S. H. (2008). Who Chooses A Consumer-Directed Health Plan? *Health Aff, 27*(6), 1671-1679.

Bloche, M. G. (2007). Consumer-Directed Health Care And The Disadvantaged. *Health Affairs, 26*(5), 1315-1327.

Buntin, Melinda B., Damberg, Cheryl, Haviland, Amelia, Kapur, Kanika, Lurie, Nicole, McDevitt, Roland, Marquis, Susan, (2006). Consumer-Directed Health Care: Early Evidence About Effects On Cost And Quality. *Health Affairs, 25*(6), 516-530.

Callan, V. J., & Johnson, M. (2002). Some Guidlines for Risk Planners in Measuring and Advising Clients About Their Levels of Risk Tolerance. *Journal of Personal Tolerance, August 2002*, 31-44.

Cardon, J. H., & Showalter, M. H. (2007). Insurance choice and tax-preferred health savings accounts. *Journal of Health Economics, 26*(2), 373-399.

Christianson, Parente, S. T., & Feldman, R. (2004). Consumer Experiences in a Consumer Driven Health Plan. *Health Services Research, 39*(4), 1123-1140.

Claxton, G., Rae, M., Panchal, N., Damico, A. & Lundy, J. (2012). *Employer Health Benefits 2012 Annual Survey.* (Research Report No. 8345). Retrieved from: The Henry J. Kaiser Family Foundation website: http://ehbs.kff.org/?page=list&id=1

Fowles, J. B., Kind, E. A., Braun, B. L., & Bertko, J. (2004). Early Experience with Employee Choice of Consumer Directed Health Plans and Satisfaction with Enrollment. *Health Services Research, 39*(4), 1141-1158.

Greene, J., Hibbard, J., Dixon, A., & Tusler, M. (2006). Which consumers are ready for consumer-dirrected health plans? . *Journal of Consumer Policy, 29*, 247-262.

HSAFinder (2008). Employer HSA Primer. (Website) Retrieved from: http://www.hsafinder.com/What-Are-HSAs

Hughes-Cromwick, P., Root, S., & Reohrig, C. (2007). Consumer Driven Healthcare: Information, Incentives, Enrollment, and Implications for National Health Expenditures. *Business Economics* (April 2007), 43-57.

Kronick, R. T., Dreyfus, T., Lee, L., & Zhou, Z. (1996). Diagnostic Risk Adjustment for Medicaide: The Disability Payment Syastem. *Health Care Finance Review, 16*(3), 7-33.

Lee, C., & Rogal, D. (1997). *Risk Adjustment: A Key to Changing Incentives in the Health Insurance Market*. Washington, DC: The Robert Woods Johnson Foundation.

Liu, S., & Chollet, D. (2006). *Price and Income Elasticity of the Demand for Health Insurance and Care Health Care Services: A Critical Review of the Literature* (Report No. 233-02-0086). Washington DC: Mathematica Policy Research, Inc.

Lo Sasso, A. T., Rice, T., Gabel, J. R., & Whitmore, H. (2004). Tales from the New Frontier: Pioneers' Experiences With Consumer-Driven Health Care. *Health Services Research, 39*(4), 1071-1089.

Marquis, M. S., & Kapur, K. (2005). Family Decision Making When Two Workers are Offered Group Covereage. [Working paper. Arlington, VA]. *Rand*.
Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (2003). Retrieved from: http://www.medicare.gov/medicarereform/108s1013.htm.

Neurath, P. (2002). IRS Ruling Expected to Increase HRA Participation. *Health care News.* The Heartland Institute. Retrieved from: http://www.heartland.org/Article.cmf?artID=10670

Parente, S. T., Feldman, R., & Christianson, J. B. (2004a). Employee Choice of Consumer-Driven Health Insurance in a Multiplan, Multiproduct Setting. *Health Services Research, 39*(No. 4, Part II), 1091-1112.

Parente, S. T., Feldman, R., & Christianson, J. B. (2004b). Evaluation of the Effect of a Consumer-Driven Health Plan on a Medical Care Expenditures and Utilization. *health Services Research, 39*(No.4), 1189-1210.

Parente, S. T., Feldman, R., & Christianson, J. B. (Producer). (2008, 9/15/08) *The Impact of Health Status and Price on Plan Selection in a Multiple-Choice Health Benefit Program Including HRA and HSA Options*. Podcast retrieved from: www.ehealthplan.org.

Robinson, J. C. (2002). Renewed Emphasis On Consumer Cost Sharing In Health Insurance Benefit Design. *Health Affairs* (March, 2002), 139-154.

Tollen, L. A., Ross, M. N., & Poor, D. (2004). Risk Segmentation Related to the Offering of a Consumer-Directed Health Plan: A Case Study of Humana Inc. *Health Services Research, 39*(4), 1167-1187.

U.S. Department of Health & Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics. (2009, March). *Consumer-Directed Health Care for Persons Under 65 Years of Age with Private Health Insurance: United States, 2007*. (Issue Brief No. 15). Hyattsville, MD: Cohen, R. A., & Martinez, M. E.

U.S. General Accountability Office (2006). *First Year Experience with High-Deductible Health Plans and Health Savings Accounts*. Retrieved December 2, 2006. Retrieved from: www.gao.gov/cgi-bin/getrpt?GAO-06-271.

Zaslavsky, A. M., & Epstein, A. M. (2005). How patients' sociodemographic characteristics affect comparisons of competing health plans in California on HEDIS(R) quality measures. *International Journal for Quality in Health Care, 17*(1), 67-74.

Wison, V., Smith, C., Hamilton, J., Madden, C., Skillman, S., Mackay, B., et al. (1998). Risk Adjustment Case Study: The Washington State Health Care Authority. *Inquiry, 35*(2), 178-192.

Andersen, R. (1995). Revisiting the Behavioral Model and Access to Medical Care: Does it Matter? *Journal of Health and Social Behavior, 36*(1), 1-10.

Tabachnick, B. G., & Fidell, L. S. (2001). *Using Multivariate Statistics* (Fourth Edition ed.). Needham Heights, MA: Allyn & Bacon.

Webster , B. H. J. & Bishaw, A. (2006). *Income, Earnings, and Poverty Data From the 2005 American Community Survey*. Retrieved from: https://http://www.census.gov/prod/2006pubs/acs-02.pdf.

US Department of Labor (2006). *Overview of BLS Statistics on Pay and Benefits.* Retrieved from: http://www.bls.gov/bls/wages.htm

Appendix A – Variable Frequencies

(N=9,617)

Variable	Percent %	Frequency # N=9,617
Employee Gender		
Male	82.5	7,933
Female	17.5	1,684
Ethnicity		
White	86.4	8,309
African American	5.6	537
Asian	0.9	84
American Indian/Alaska Native	1.1	101
Hispanic	5.7	547
Native Hawaiian/Other Pac. Isles	0.0	1
Two or more	0.3	31
Not Stated	0.1	7
Hourly/Salaried		
Hourly	60.1	5,783
Salaried	39.9	3,834
Union Status		
Union	29.1	2,797
Non-Union	70.9	6,820
Region		
Region 1 – New England	0.0	0
Region 2 – Mid Atlantic	0.1	10
Region 3 – East North Central	47.9	4,609
Region 4 – West North Central	0.5	46
Region 5 – South Atlantic	19.5	1,877
Region 6 – East South Central	4.3	414
Region 7 – West South Central	27.1	2,604
Region 8 – Mountain	0.0	0
Region 9 – Pacific	0.6	57
Plan Chosen 2006		
PPO	58	5,577
HRA	37.3	3,586
HSA Eligible CDHP	4.7	454
FSA Participation 2005		
Yes	17.7	1,701
No	82.3	7,916
Marital status		
Single	12.3	1,186
Married	79.0	7,597
Separated	.0	1
Divorced	8.3	793
Widowed	.4	40

Appendix A continued…

Coverage Tier All Plans 2006		
Self	17.4	1,669
+ Spouse	21	2,022
+ Children	11	1,057
+ Family	50.6	4,869
Coverage Tier PPO Only		
Self	15.3	854
+ Spouse	23.2	1,294
+ Children	10.8	603
+ Family	50.7	2,826
Coverage Tier **HRA Only**		
Self	19.2	688
+ Spouse	17.2	615
+ Children	12.1	433
+ Family	51.6	1,850
Coverage Tier **HSA Eligible CDHP Only**		
Self	28	127
+ Spouse	24.9	113
+ Children	4.6	21
+ Family	42.5	193

Notes:
[a] Regions based on the U.S. Census Bureau regional division

Appendix B – All Enrollees' Descriptive Statistics

Variable	Mean	Median	Std. Deviation	Range
Employee Age (as of 1/06)	50	51	7	42
Member Months 2005	35	36	17	143
Out-of-Pocket Maximum	$4,871	$6,000	$1,391	$4,300
Deductible	$524.30	$0	$1,056	$6,300
Employee Earnings 2005	$69,615	$66,181	$36,853	$1,026,421
Variable Cost Sharing 2005	$1,470	$995	$3,750	$332,031
Premium Fixed Cost 2005	$1,817	$2,120	$673	$4,524
Relative Risk Score 2005	78	46	101	978

Appendix C - Descriptive Statistics by Plan

Variable	Mean	Median	Std. Deviation	Range
PPO Plan:				
Member Months 2005	35	36	16	131
Out-of-Pocket Maximum	$4,824	$6,000	$1,481	$4,000
Deductible	$0	$0	$0	$0
Employee Earnings 2005	$68,435	$66,072	$31,848	$888,924
Variable Cost Sharing 2005	$1,633	$1,194	$1,765	$42,860
Premium Fixed Cost 2005	$1,906	$2,120	$580	$4,524
Relative Risk Score 2005	91	55	111	978
HRA Plan Only:				
Member Months 2005	35	36	17	95
Out-of-Pocket Maximum	$4,979	$6,000	$1,167	$3,000
Deductible	$830	$1,000	$195	$500
Employee Earnings 2005	$70,751	$65,958	$43,635	$1,016,553
Variable Cost Sharing 2005	$1,248	$748	$5,682	$332,031
Premium Fixed Cost 2005	$1,801	$2,120	$669	$4,524
Relative Risk Score 2005	60	35	80	920
HSA ELIGIBLE CDHP:				
Member Months 2005	30	24	17	83
Out-of-Pocket Maximum	$4,487	$4,200	$1,755	$4,200
Deductible	$4,487	$4,200	$1,755	$4,200
Employee Earnings 2005	$75,147	$70,102	$34,915	$368,676
Variable Cost Sharing 2005	$1,210	$508	$1,953	$16,478
Premium Fixed Cost 2005	$851	$767	$950	$3,165
Relative Risk Score 2005	57	22	97	582

Vita

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