CONSUMER-DIRECTED HEALTH INSURANCE VS. MANAGED CARE: ANALYSIS OF HEALTHCARE UTILIZATION AND EXPENDITURES INCURRED BY EMPLOYEES IN A RURAL AREA ☆

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ABSTRACT

Consumer-Directed Health Plans (CDHPs) are proposed as an option to control healthcare costs. No research has addressed their applicability in rural settings. This study analyzes three years (2003–2005) of healthcare

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expenditure and utilization incurred by two employers and a national carrier providing data from a rural state, Kentucky. The study included two measures of expenditures (health care and prescription drugs) and three measures of utilization (physician visits, hospital admissions, and hospital inpatient days). In general, the CDHP successfully controlled the growth of medical costs. These findings suggest that CDHPs may be a viable alternative benefit structure for rural employers.

INTRODUCTION

Healthcare expenditures in the United States continue to increase rapidly. It is projected that by 2014, total healthcare spending in the United States will constitute 18.7% of the gross domestic product (Heffler et al., 2005). Multiple factors have led to these increases in healthcare expenditures including population growth, medical inflation, and general inflation, as well as income, education level, and the demand for health insurance (McBride, 2005). As costs rise and the demand for health insurance increases, employers are expected to provide a stable or even lower share of insurance premiums. These problems are particularly great in rural populations, which are often underserved and must apply more of their income to healthcare costs with less coverage for preventive services, dental care, or drugs (Bailey, 2004).

Eberhardt and Pamuk (2004) found that rural residents have higher rates of premature mortality (before age 75), higher rates of death due to unintentional injuries, chronic obstructive pulmonary disease and suicide when compared to suburban residents. Both the most urban and the most rural areas have higher infant mortality rates and lower rates of health insurance coverage. Socioeconomic and cultural factors must be taken into account as these populations are studied. The most significant differences occurred between rural and suburban areas reflecting the need to include suburban as a separate category from urban for health research. Kronenfeld (2005) points out that low SES, racial and ethnic disparities and overall poor health outcomes can be linked to those that are underinsured and would be less likely to use preventive services. As noted by Meng et al. (2009) rural Americans are more likely to practice poor health behaviors, such as physical inactivity and smoking which can lead to higher rates of obesity, lung cancer, and other chronic diseases.

Rural minorities are at a greater disadvantage than rural residents in general, especially concerning quality of care, access to health insurance and

utilization of dental services (Agency for Healthcare Research and Quality [AHRQ], 2005). Rural elderly are more often classified as "poor" and are more likely to be dependent on Medicare and Medicaid than urban elderly. Rural children experience fatal injuries at a rate of 44% higher than urban children (Wilhide, 2002). Rural women are less likely to have mammogram screenings or pap smears than urban women (Hard Times in the Heartland, 2009). A study conducted by Haas et al. (2004) suggests that for blacks, Latinos and whites, the racial and ethnic demographics of one's county of residence is associated with an individual's access to care, due to the social norms within the area that could influence expectations for health care. Residential segregation may also provide fewer economic opportunities, poorer built environments, fewer public resources, lack of adequate housing, more violence, and higher levels of pollution.

The cultural factors in remote rural areas have a significant influence on the health status of their residents. For example, Appalachia experiences dramatically poor health status compared with the rest of the country. Cultural factors that contribute to that status include reliance on informal communication channels (friends, family, and neighbors) instead of health professionals, a historical economic dependence on tobacco, religion as an "external locus of control" used for decision making, and geographical isolation. As a result of the economic and industrial isolation of America's rural areas many individuals/communities may be reluctant to challenge industrial pollution out of fears of the economic consequences (Behringer & Friedell, 2006). AU :2

Rural residents make up 20% of the U.S. population, but only 9% of the nation's physicians practice in rural areas (van Dis, 2002). Access to quality health services was ranked in *Rural Healthy People 2010* as the highest priority focus area for rural populations. These priorities were selected by state and local rural health leaders (Gamm & Hutchison, 2004). The general public also views access to care as important, especially when there is a fear of losing their own health insurance due to employers dropping coverage or raising the employees' contribution to premiums (Kronenfeld, 2007). The majority of adults, the working-age population, have no government programs to act as a safety net and protect them against the loss of healthcare coverage. Good jobs that provide healthcare benefits are critical for adequate healthcare access, especially in the current economic downturn (Kronenfeld, 2009). AU :3

A study conducted by Brems, Johnson, Warner, and Roberts (2006) revealed that healthcare providers in rural communities faced more challenges in providing care than providers in urban communities.

These challenges included limited resources, confidentiality concerns, overlapping roles, provider travel, training constraints, lack of access to services, language differences, and patient avoidance of care.

Rural areas are not only medically underserved, but also suffer from inadequate access to health insurance coverage, having large numbers of uninsured, and underinsured persons. For a variety of social, economic, and systemic reasons rural areas suffer high levels of health problems (Beck, Jijon, & Edwards, 1996; Johnson, Murdock, Hoque, & McGehee, 2003; van Dis, 2002) which are only worsened by poor access to health care and lack of health insurance (Gamm, Hutchison, Dabney, & Dorsey, 2003). Furthermore, while even those rural residents who have health insurance tend to have lesser benefits (Hartley, Quam, & Lurie, 1994), the cost of providing health care in rural areas has been found to be greater (Asthana, Gibson, Moon, & Brigham, 2003; Asthana & Halliday, 2004). These realities have resulted in the identification of increasing access to health insurance in rural areas as a national public health priority (Gamm et al., 2003).

The business sector of rural communities has not generally contributed much toward the amelioration of these problems (Morton, 2001). The contribution of employer-sponsored health insurance is limited by the fact that in rural areas residents rely more on small employers and these are the very businesses that are most likely to experience higher than average insurance premium increases (Scorsone, 2002).

The current economic downturn has resulted in rural jobs being lost at a faster rate than the national average, which in turn results in the loss of healthcare benefits. Since the beginning of the 2008–2009 recession, manufacturing in rural areas, which typically offer the best benefits, have loss nearly 5% of their jobs (Hard Times in the Heartland, 2009). Kronenfeld (2008) reveals that many health experts conclude that part of the cause of disparities in health and health care use in America are the vast amounts of economic inequality and poverty found in this country. Kronenfeld (2008) also notes that market ideology is the most important barrier to healthcare equity due to the market theory which supports that distribution will follow economic demand rather than need.

Health benefit programs have been attempting to offset some of the expenditure growth and a consumer-directed health plan (CDHP) is one possible strategy for doing so. CDHPs combine high deductible insurance for major expenses with a tax-advantaged savings account – such as an individual Health Reimbursement Account (HRA) or a Health Savings Account (HSA) – to cover routine medical expenses (RAND Health, 2007). A major goal of the CDHP is to reduce over-utilization of healthcare

services, which in turn would lower healthcare costs. Research suggests that when consumers are faced with higher cost sharing, they will respond to financial incentives and consume fewer services in order to control their costs (RAND Health, 2007; Beeuwkes-Buntin et al., 2006). Also, it is assumed that this plan design will transform enrollees into better consumers of health care, aiding in an overall decline in healthcare costs (Agrawal, Ehrbeck, Mango, & Packard, 2005). Overall, the CDHP is based on the idea AU :4 that if members are better healthcare consumers, they will use fewer health services and reduce total healthcare expenditures. Motivation for behavior change – reducing healthcare utilization – is encouraged by the employee's ownership of the initial funds of healthcare dollars contributed by the employer (Bandura, 1986).

CDHPs have received praise as well as criticism since they have been available as a health plan option. Researchers have looked into their effect on the quality of health care that individuals receive as well as the financial benefits CDHPs provide to employers and their employees in comparison to the traditional health plans that are provided today. A study conducted by Parente, Feldman, and Christianson (2004) measured the impact of a CDHP on an employer with more than 20,000 employees grouped into one of the three cohorts: HMO, PPO, or CDHP. They found that over the period from 2000 to 2002 the CDHP enrollees had lower total expenditures than the PPO enrollees, but higher expenditures than enrollees in the HMO after 2 years. Of particular note, however hospital admissions and expenditures did increase relatively dramatically for the CDHP cohort. The authors concluded that the CDHP was a "viable alternative" to traditional health plans (Parente et al., 2004). In a national survey, it was found that because of higher out-of-pocket costs, individuals in CDHPs were less satisfied than members of more comprehensive plans (Fronstin & Collins, 2005).

A major problem arises from decision-support tools that do not provide enrollees with adequate information concerning the quality of health care or cost of healthcare services. Paul Keckley, of the Deloitte Center for Health Solutions (2008) notes, "The trend seems clear: Most Americans will be paying a larger role in purchasing health services, either directly through individual health insurance policies and high deductible plans, or indirectly by using tools to make comparisons among doctors, hospitals, treatment options and insurance products." In addition, some argue that CDHPs favor risk-segmentation, resulting in a stronger preference for CDHPs in healthier people than in less healthy individuals (Tollen, Ross, & Poor, 2004). This could influence the average healthcare costs incurred by a subscriber of a CDHP. When employers offer a CDHP as one of the two or

more options, enrollment in the CDHP is generally lower than in traditional plans. According to a 2005 national employer benefit survey, only 1% of U.S. employers offered an exclusive CDHP option, without any other traditional plans in conjunction with it (United States Governmental Accountability Office, 2006). AU :5

Despite mixed opinions, enrollment in CDHPs is on the rise. In January 2005, 3 million people were enrolled in these plans. By April 2006, the number increased to approximately 5 million (United States Governmental Accountability Office, 2006). In a March 2004 study nearly 75% of employers said they are very or somewhat likely to offer their employees a high-deductible health plan with a HSA by 2006 (Mercer Human Resource Consulting, 2004).

CDHPs have been under scrutiny, but research has not examined their effects in the rural setting. Both rural and urban families experienced similar increases in health spending from 2001 to 2002 (McBride, 2005). Dealing with these increased costs, however, presents particular challenges for rural communities. The rural economy consists largely of smaller employers and the self-employed. Rural residents are often more likely to have fewer health insurance choices, higher premium rates, or be uninsured (Bailey, 2004). For some smaller employers, implementing a CDHP may be the difference between offering employee health benefits or not.

This study analyzes the healthcare expenditures and utilization incurred by two employers in South Central Kentucky and regional data for Kentucky for one health insurer. One employer offered the CDHP only, the other employer offered a traditional managed care plan. An additional comparison used regional data from a national carrier in Kentucky for the years 2003, 2004 and 2005. Aggregate claims and enrollment data were obtained from the employers and reports released by the health insurance carrier. The study included two measures of expenditures (health care and prescription drugs) and four measures of utilization (physician visits, hospital admissions, hospital length of stay, and emergency room visits).

MATERIAL AND METHODS

The study population includes employees and their dependents enrolled in the healthcare plans offered by two employers during the calendar years 2003, 2004, and 2005. The two em ployers; Company A (a manufacturing industry) and Company B (a university), are located in South Central Kentucky. The South Central area of Kentucky is considered rural.

Company A's location is strictly rural, Company B is located in a smaller metropolitan area, whereas the regional data is a combination of mostly rural and small towns, with some metropolitan and urban areas. Both employers offered exclusively one type of self-funded health insurance plan to their respective employees. Company A offered a CDHP and Company B offered the traditional managed care plan. The regional data, from a national carrier, was comprised of mostly PPO data, although a minimal amount of consumer-driven and HMO data was also included.

The data for this study came from three distinctive sources; the CDHP data were collected from the manufacturer's health insurance service provider; the managed care data came from the university's human resource department; and the regional data came from a national carrier. Healthcare expenditures and utilization incurred by the respective members were analyzed by comparing claims and enrollment data. Claims data consisted of the total healthcare costs incurred per calendar year, in 2003, 2004, and 2005, including the deductible, co-pay, and co-insurance. Prescription drug expenditures incurred by the members were also analyzed. Similarly, an analysis of the total number of physician office visits, hospital admissions, and hospital inpatient days incurred by members was also carried out. For companies A and B, data were collected in the month of March, after the claims audit was done for the prior year. These helped to reduce errors such as duplication of entries and loss of claims data. Enrollment data were obtained from the records provided by the respective employers. This data included the total number of subscribers in each of the years, their mean age, and the ratio of males to females. For each year, gross healthcare expenditures were obtained by combining the total net pay medical, co-insurance, co–pay, and the deductible. This amount was divided by the total number of members to get an average per capita healthcare expenditure, which was compared among the employers for each of the years and from one year to the next for each of the employers.

The Kentucky regional data were obtained from a report provided by a national carrier located in Kentucky. Before the national carrier adopting a new data-reporting platform in mid-2004, all Kentucky businesses were grouped into three areas. Their new platform allowed them to break their data into five more refined areas, however, this did not happen immediately. Beginning in June 2004, as groups came up for renewal, they were rolled into the new platform. Consequentially, the data revealed gradual growth from June 2004 to June 2005 in the three new areas and a gradual decline in two. This was not real growth and decline, but rather limitations in the data.

Bearing in mind the issue of risk-segmentation, in an attempt to eliminate possible selection bias in this study, we chose employers who offered only one type of health plan to their employees. However, differences in prior health status of the enrolled groups could potentially influence healthcare costs and utilization. The data from the Kentucky regional area came mainly from private sector PPOs, with no Medicare or Medicaid data included.

Company A

Company A's healthcare plan had a 3-year average membership of 2,953, with a mean age of 31. The 3-year average gender mix for Company A was male, 51% and female, 49%.

This manufacturing company offered an exclusive CDHP to all of their employees. The members of this plan included the employees, their dependents, retirees, and the long-term disability recipients. The company switched to the CDHP due to the rising healthcare costs as well as to encourage their employees along with their dependents to become more involved in healthcare decisions. As a part of this plan structure, the employer established a health fund for each eligible employee.

When CDHPs first began, plans offered one account option: the HRA, but employers now have added three options that include health savings accounts (HSA), retiree reimbursement accounts (RRA), and a flexible spending account (FSA). An HRA is a source of funding that the employer establishes and solely sponsors, in which employees can use to pay for qualified medical expenses. Account balances can be carried over at the end of the year. However, it is company specific, whereas, if the employee leaves the company, the account does not travel with them.

The health savings account is a tax-advantaged account created to pay for medical care expenses. With this account, the employer, employees, and their family members (or any combination) may make contributions to the account. Employees can contribute to the HSA on a pre-tax basis. HSA funds can be invested for tax-free growth and withdrawals for qualified medical expenses are also tax-free. In addition, leftover HSA funds automatically roll over from year to year. Unlike an HRA, the money in an HSA is not company specific and is portable. Retiree reimbursement accounts are like the original HRAs, except they reimburse medical costs only after a worker retires. Employers create RRAs for active employees, and then only the employer credits the accounts. A flexible spending account allows

an employer, an employee, or both to make regular deposits to an account through salary deduction. For employees, this money avoids both income tax and Social Security tax. Money in the FSA can only reimburse qualified medical expenses. However, unlike HRAs, HSAs, and RRAs, the balances in an FSA cannot carry forward.

In 2003 and 2004, the company offered one plan, an HRA with the option to elect an FSA. However in 2005, the company added a second plan option, an HSA. The amounts in the funds varied depending on the employee's family size. Aetna was chosen to be the third party administrator for this fund. As long as money was available in this account, it could be used to pay for 100% of healthcare expenses. Expenses above the deductible were paid by the employer for all in-network services. In addition to CDHP, Company A also made substantial changes to their wellness programs, which included providing financial incentives to their employees for filling out health risk appraisals (Tables 1 and 2). As is the case with many CDHPs, Company A offers a PPO network for enrollees in its health plan.

Company B

Company B's healthcare plan had a 3-year average membership of 2,835, with an average age of 35. The 3-year average gender mix for Company B was male, 48% and female, 52%.

This employer offered a traditional managed care (PPO) plan to all of their employees. There were three plan designs from which to choose when selecting from their health insurance option: Blue Access High, Blue Access Low, and Blue Access Economy. All three plans utilized the same network.

Table 1. An Overview of Company A's Plan 2003 and 2004.

	Employee	Employee+1	Employee+2 or More
Annual employer's allocation to an employee's deductible (this allocation is the first dollar coverage used)	\$400[a]	\$600[a]	\$800[a]
Employee's out of-pocket expense (deductible)	\$600	\$900	\$1,200

Notes: Employer pays for PPO coverage above the deductible at 100% with no contributions by employee and no co-insurance.
Above is the plan for the Health Reimbursement Account (HRA) with the option to elect a Flexible Savings Account (FSA) to fund employee's out-of-pocket expense.
[a]Includes \$200 bonus for completion of Health Risk Appraisal.

Table 2. An Overview of Company A's Plan 2005.

	Employee	Employee+1	Employee+2 or More
Annual employer's allocation to an employee's deductible (this allocation is the first dollar coverage used)	\$450[a]/\$500[b]	\$675[a]/\$800[b]	\$900[a]/\$1,100[b]
Employee's out-of-pocket expense (deductible)	\$650/\$800[b]	\$975/\$1,300[b]	\$1300/\$1,800[b]

Notes: Employer pays for PPO coverage above the deductible at 100% with no contributions by employee and no co-insurance.
Above is the plan for the Health Reimbursement Account (HRA) with the option to elect a Flexible Savings Account (FSA) or a Health Savings Account (HSA) to fund employee's out-of-pocket expense.
In 2005, Pharmacy became integrated into the plan.
[a]Includes \$200 bonus for completion of Health Risk Appraisal.
[b]HSA option.

The differences in the plans are the deductibles, co-pays, co-insurances, number of visits for certain services and out of pocket maximums, with Blue Access High being the highest coverage plan. This employer also offers an FSA as an additional option (Table 3). The PPO network for Company B is somewhat larger than that of Company A, but includes the providers in the Company A network.

Kentucky Regional Data

A national insurance carrier with a multiline of businesses in Kentucky supplied the regional data. The Kentucky regional healthcare plan had a 3-year average membership of 355,368, with an average age of 33. The 3-year average gender mix for the region was male, 48% and female, 52%. This insurance carrier offered a mix of HMO, PPO, and consumer-directed healthcare plans. There was a very small percentage of HMO and consumer-directed business, with the majority of the data coming from PPO.

RESULTS

Descriptive statistics for the three groups are shown in Table 4. The numbers of members were consistent throughout the 3-year period for

Table 3. An Overview of Company B Plan 2003/2004[a]/2005[b].

Plan Name (Blue Access)	Total Premium/ Month ($)	Employer Monthly Share ($)	Employee Monthly Share ($)	Deductible ($)	Co-Pay ($)	Co-Insurance (%)
High						
Self only	341.00	341.00	0.00	400.00	15.00	10
	381.00[a]	381.00[a]				
	390.00[b]	390.00[b]				
Self and spouse	593.00	341.00	252.00	800.00[c]	15.00	10
	638.00[a]	381.00[a]	257.00[a]			
	707.00[b]	390.00[b]	317.00[a]			
Self and children	503.00	341.00	162.00	800.00[c]	15.00	10
	546.00[a]	381.00[a]	165.00[a]			
	555.00[b]	390.00[b]	165.00[b]			
Self, spouse, and children	722.00	341.00	481.00	800.00[c]	15.00	10
	872.00[a]	381.00[a]	491.00[a]			
	881.00[b]	390.00[b]	491.00[b]			
Low						
Self only	341.00	341.00	0.00	750.00	25.00	20
	381.00[a]	381.00[a]				
	N/A[b]	N/A[b]				
Self and spouse	526.00	341.00	185.00	1,500.00	25.00	20
	580.00[a]	381.00[a]	189.00[a]			
	690.00[b]	390.00[b]	219.00[b]			
Self and children	445.00	341.00	104.00	1,500.00	25.00	20
	487.00[a]	381.00[a]	106.00[a]			
	496.00[b]	390.00[b]	106.00[b]			
Self, spouse, and children	721.00	341.00	380.00	1,500.00	25.00	20
	769.00[a]	381.00[a]	388.00[a]			
	778.00[b]	390.00[b]	388.00[b]			
Economy						
Self only	341.00	341.00	0.00	1,000.00	30.00	30
	381.00[a]	381.00[a]				
	N/A[b]	N/A[b]				
Self and spouse	464.00	341.00	123.00	2,000.00	30.00	30
	506.00[a]	381.00[a]	125.00[a]			
	530.00[b]	390.00[b]	140.00[b]			
Self and children	393.00	341.00	52.00	2,000.00	30.00	30
	434.00[a]	381.00[a]	53.00[a]			
	443.00[b]	390.00[b]	53.00[b]			
Self, spouse, and children	627.00	341.00	286.00	2,000.00	30.00	30
	673.00[a]	381.00[a]	292.00[a]			
	682.00[b]	390.00[b]	292.00[b]			

High, Low, and Economy are the three types of plans.
[a]Indicates 2004 adjustments.
[b]Indicates 2005 adjustments.
[c]$800 is a collective maximum deductible amount when covering more than just the employee.

Table 4. Member Characteristics and Outcomes.

	Members				
	2003	2004	+/−	2005	+/−
Company A	2,994	2,945	−1.6%	2,920	−0.85%
Company B	2,702	2,790	3.3%	3,014	8.03%
KY regional	267,328	414,413	55.0%	384,362	−7.25%
Mean age					
Company A	30	31	0.7	31.5	0.9
Company B	35	35	0.0	35	0.0
KY regional	33	34	1.0	33	−1.0
Percentage of female					
Company A	48.9	49	0.2%	48.7	−0.61%
Company B	52.7	54.6	3.6%	49.9	−8.61%
KY regional	52	53	1.9%	52	−1.89%
Admissions per 1,000 members					
Company A	71	72	1.4%	81	12.50%
Company B	145	175	20.7%	152	−13.14%
KY regional	79	85	7.6%	80	−5.88%
Inpatient days per 1,000 members					
Company A	162	208	28.4%	223	7.21%
Company B	883	670	−24.1%	418	−37.61%
KY regional	342	366	7.0%	348	−4.92%
Physician office visits per 1,000 members					
Company A	3,393	3,420	0.8%	3,559	4.06%
Company B	11,739	13,125	11.8%	12,960	−1.26%
KY regional	3,120	3,295	5.6%	3,230	−1.97%
Drug costs per member					
Company A	$398.20	$402.42	1.1%	$475.09	18.06%
Company B	$371.28	$425.71	14.7%	$512.86	20.47%
KY regional	$280.49	$329.99	17.6%	$430.14	30.35%
Total medical costs per member					
Company A	$2,003.11	$2,131.00	6.4%	$2,378.53	11.62%
Company B	$2,058.53	$1,595.17	−22.5%	$2,142.38	34.30%
KY regional	$1,809.97	$2,129.38	17.6%	$2,413.28	13.33%

companies A and B. For the regional plan data, the number of members in the region for the national carrier increased significantly from 2003 to 2004 due to the change in the national insurance company's territorial reporting structure. A significant number of members were added in 2004, only to lose

them in 2005. Owing to the structure change and the significant shift in members, the national insurance company's confidence for the regional numbers from 2003 is not as high as for 2004 and 2005 (Table 4). The average age and gender ratio of members is similar across the 3-year period for each of the three groups.

The data in Table 4 demonstrates similar patterns for the CDHP and regional data, particularly for the years 2004 and 2005, during which medical costs increased 11.62% for CDHP and 13.33% for the regional data. Thus, the cost increase was slower for the CDHP than for the regional carrier. This contrasts with previously reported studies which showed decreased utilization patterns among members of CDHP (Beeuwkes-Buntin et al., 2006). Given the strength of the similarities, it appears that the experience of the CDHP largely mirrored the experience of the traditional plan in the region. If this trend continued over a significant period of time, CDHP could be a major factor in cost containment.

The measures for utilization (admissions, hospital inpatient days and office visits) are shown in Table 4. For admissions and office visits the experiences of the CDHP plan of Company A were similar to the regional plan data. However, the strong year to year variation for Plan B contrasts with both the CDHP and the regional data. Speculation of the reasons for this variation cannot be supported by reliable data and will not be presented in this study.

Table 4 also shows total medical costs per member and total drug costs per member. The year to year variation in Plan B continues to be evident. Costs for Company A are rising slower than for either Company B or the region.

DISCUSSION

This study has several limitations. One is the short-time frame of the study. Three years of data, especially involving a new program, may not accurately reflect a long-term trend. Another is the small number of companies participating in the study. Although CDHPs are increasing in number, relatively few companies in Kentucky appear to have implemented consumer-directed health insurance plans and even fewer make their aggregate data available for research. The fact that the data available for this study were aggregate data means that it was not possible to partial out the influence of a number of potentially confounding variables that might have been of interest. This is an important limitation because racial and

class disparities must both be considered to get a true picture of the challenges in equal access to quality health care (Kronenfeld, 2005).

Generalization from this study is further limited, not only by the fact that we are looking at two companies and one regional provider, but also by changes that occurred in the plans over the course of the study. Changes in the geographic region covered by the national carrier data and in services covered under the company health plans occurred during the course of the study. These are inherent problems in conducting research in real world, applied settings. As plans are adjusted, the data may change accordingly.

This study compares a rural employer offering a CDHP plan, another offering a traditional health plan, and regional health plan data. The rural CDHP experience was similar to the regional health plan data. The traditional health plan had significant variation during the period, which made it very different from both the CDHP and regional data.

As was the case in a previous study of a large scale CDHP (Parente et al., 2004), this study has also found evidence that for rural employers a CDHP is "a viable alternative." The present study is not offered as a definitive evaluation of the efficacy of these plans but rather as a first examination of their potential in rural health care. Many factors, including implementation methods, demographics of the employee population and consumer information could influence the success of a CDHP. This study should be viewed as one data point, as different designs of the CDHP are likely to yield different results.

Over time, as employees become more familiar with the CDHP, and as consumers receive better information which allows better choices, cost savings are likely to improve. In short, if, as Beeuwkes-Buntin et al. (2006) suggest, CDHP makes consumers more "prudent managers of their own health and health care" we should see slower cost increases as members make smarter choices with their healthcare dollars.

Taking into consideration the concern that efficient operation of a CDHP requires informed consumers, it is noteworthy that this plan involved a small rural company with factory workers. This contrasts with the population studied by Parente et al. (2004). To some extent, the present study, with a different design and population, supports their conclusion regarding the viability of CDHPs.

Future research on rural health insurance needs to address the realities of consumer choice in rural settings. The entire issue of consumer choice in the healthcare system has been underexamined in economic analyses of healthcare financing (Ryan, 2006). The difficulties consumers encounter in

making wise choices among providers of health care and ancillary services may be even greater in the rural setting. Sources of consumer-accessible data may be fewer and the choices of services themselves may be far more restricted than in urban settings. Rural patients, for instance, cannot choose ambulatory surgery over inpatient surgery if there is no ambulatory surgery center in their area. Given the constraints of the local market, the fact cost savings were still evident in the CDHP is encouraging.

Our report is an attempt to open a professional dialogue on CDHPs for rural health. Our results suggest that they have potential in rural as well as urban settings. Problems with implementation and management of CDHPs will determine how successful they can be in any setting but may present special challenges in rural health. However, these findings suggest that CDHP plans may be a viable alternative benefit structure for rural employers concerned about the costs of providing more traditional PPO or HMO insurance plans.

Population health studies have determined that social status, income, education, occupation, and place of residence have more significance in life expectancy and health than the healthcare system does. Hartley (2004) points out that rural health in particular, when immersed in ''traditional'' cultures may have a health-enhancing effect, whereas cultural transition results in increases in stress related illnesses such as mental illness and poor cardiovascular health. He warns, however, that we should not reify culture into a ''tacit assumption that rural culture is based on standard societal roles that have evolved out of an agrarian history.''

CDHP represents only one of the number of potential ways to address issues of healthcare access for the rural population. Research on rural health needs to examine both individual influences such as education and attitudes and ecological influences such as the environment, culture, and health services (Eberhardt & Pamuk, 2004; Hartley, 2004). No insurance plan alone will provide the answer to the problems of rural health disparities, but a plan such as CDHP may contribute to the solution.

A study conducted by Probst, Moore, Glover, & Samuels (2004) concluded that a future of better health for rural minorities must include AU :7 better surveillance by improved sampling of rural racial and ethnic minority populations. This would require a cross-sectional approach, which is tailored to local socioeconomic environments, with input from local community members. A broad multidisciplinary and multi-institutional approach must be included in data collection and healthcare research to insure that all population groups are accounted for and considered in policy development and reform.

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