Patterns and Factors Associated With Medical Expenses and Health Insurance Premium Payments

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This study sought to investigate household sociodemographic characteristics as predictors of patterns of health insurance premiums and medical expenses of consumers using the 2014 Consumer Expenditures Survey. This study found that age, being married, educational attainment, and log of family salary income were associated with higher family spending on both health insurance premiums and medical expenses. Government employment status was associated with lower spending on health insurance premiums and medical expenses. Findings from this research are informative for both households in determining health insurance premiums and medical expenses throughout the life course as well as financial advisors in personal financial planning and counseling focused on health care.

Keywords: health care, health insurance premiums, household sociodemographic characteristics, payments for medical expenses

The Patient Protection and Affordable Care Act (ACA) enacted in 2010 has set forth sweeping reform of the health-care system including quality improvements and increasing access to health care. The largest impact of the ACA is on the health insurance industry, which includes the individual mandate to obtain health insurance, ensuring access for pre-existing conditions (guaranteed issue), extending coverage for young adults, and lowering costs through regulations on premiums, preventive services, and prescription drugs (Patient Protection and Affordable Care Act, 42, 2010; U.S. Department of Health and Human Services, 2015). Given these changes, the price of insurance premiums is currently volatile as insurance companies attempt to price products in light of the new regulations and the flood of new enrollees for those companies offering plans on the health insurance marketplaces and new employer-sponsored plans.

Health insurance companies set premium prices based on the risk pool, projected medical costs, administrative costs, and laws and regulations (American Academy of Actuaries, 2015). The national average monthly premium per person on the individual market in 2010 was $215 (Kaiser Family Foundation, 2011). Prior to the ACA, premiums were determined by several factors including individual health status. Under the ACA, health insurance products provided on the marketplace are now able to consider five factors when setting premium prices for individuals: age, location, tobacco use, individual versus family enrollment, and plan category (HealthCare.gov, 2016). For example, average adjusted monthly premiums are about $35 higher in areas with the lowest population density compared to the highest (Barker, McBride, Kemper, & Mueller, 2014). Employer-sponsored health insurance coverage has also been affected by the ACA, which required employers with at least 100 employees to offer coverage (in 2016 this was reduced to 50 full-time equivalent employees). There is wide variability in the cost of premiums for employer-sponsored health insurance nationwide. In 2010, the U.S. average total premium cost for single coverage among private-sector employees was $4,940, with an average out-of-pocket contribution by employees of $1,021 per year; for family coverage, average annual premium costs were

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$13,871, with employee contributions of $3,721 (National Conference of State Legislatures, 2015). Notably, Medicare premiums were not specifically targeted by the ACA.

Out-of-pocket costs for medical expenses vary for families based primarily on health insurance coverage and health status. The national average cost for health services was $795 per person in 2009; for the non-elderly without insurance the cost was $862 and for those with insurance it was $706, while those with poor health it was $1,663 (Kaiser Family Foundation, 2012). Variation in spending is evident among demographic groups as a function of health status. For example, older adults and females have higher spending per year on average (Kaiser Family Foundation, 2012) and older adult households have higher financial burden (Hong & Kim, 2000). There is also a negative relationship between health and financial stress, particularly when health care costs are increasingly high (Kim, Garman, & Sorhaindo, 2003; O'Neill, Sorhaindo, Xiao, & Garman, 2005). Another component of the ACA is the emphasis on lowering costs of medical care by emphasizing preventive care, more efficient delivery of care, and for older adults expanding prescription drug coverage in under Medicare Part D, and through the state-option to expand Medicaid.

This research was motivated by the often reported but yet incompletely understood relationship of household characteristics and health care and a lack of understanding of factors associated with health care. The overall goal of this research was to improve our understanding of the impacts of household characteristics on medical expenses and health insurance premiums in the U.S. While it is known that older adults spend more on health (Fahle, McGarry, & Skinner, 2016), including regional variations in Medicare claims (Fisher et al., 2003) and out-of-pocket costs (Chen, Norton, Langa, Le, & Epstein, 2014), less is known regarding household spending throughout the lifespan. As policymakers evaluate the ACA or discuss alternatives, understanding gaps in spending for health-related expenditures is paramount. We sought to investigate household sociodemographic characteristics as predictors of patterns of health insurance premiums and medical expenses of consumers using the 2014 Consumer Expenditures Survey.

Literature Review

What Types of Health Insurance Do Americans Have?

Health insurance in the U.S. has been intertwined with employment since the early accident and health plans were developed in the late 1800s (Scofea, 1994). To prevent inflation during World War II, Congress enacted the Stabilization Act which limited wage increases (Stabilization Act of 1942, 1942). As a result, employers began offering additional compensation through health insurance plans and other benefits. Employer-based insurance peaked in the 1980s, then coverage began declining—by as much as 6.4% points between 1987 and 2004 (Enthoven & Fuchs, 2006). Due to the rising costs of health insurance in the last two decades, the cost of employer-sponsored insurance has increased by 59% since 2000 (Cutler, 2003; Baicker & Chandra, 2006). Employers shifted some of the increasing costs of health insurance coverage to employees, which resulted in lower take-up during the 1990s and 2000s (Cutler, 2003; Gruber & McKnight, 2003). As of 2014, health insurance coverage is obtained by approximately 49% of the U.S. population through an employer, or approximately 147 million non-elderly people (Kaiser Family Foundation, 2016a). Other primary sources of health insurance coverage are Medicaid (19% of the U.S.), Medicare (13%), and other public insurance (2%) (Kaiser Commission on Medicaid and the Uninsured, 2015; Kaiser Family Foundation, 2016b).

What Drives the Cost of Health Insurance Premiums?

Market competition and firm consolidation seem to contribute to the cost of non-public insurance premiums. Dafny (2010) first demonstrated the lack of market competition lead to higher premiums, especially in areas with 6–8 or fewer firms. Further work by Dafny, Duggan, and Ramanarayanan (2012) observed that between 1998 and 2006 the merger of Aetna and Prudential resulted in increased premiums by 7%, approximately $34 billion in additional spending. A recent brief by Holahan (2014) observed that after the first open enrollment in the ACA Marketplace, premiums were lowest in areas of high concentration. Among Medicare beneficiaries, out-of-pocket costs for premiums, copayments, and coinsurance grew from $3,293 on average annually to $4,734 from 2000 to 2010, a 44% increase (Kaiser Family Foundation, 2014).

Who Pays More in Medical Expenditures?

Health care spending in 2014 accounted for 17.5% of the U.S. gross domestic product, a percentage that has risen steadily for over 30 years (Martin, Hartman, Washington, & Catlin, 2017).

Aside from specific health conditions, health expenditure differs by age and gender, and is closely tied to age. In 2010, the average elderly person spent $18,424 per year, or three times more than the average working-age adult (Lassman, Hartman, Washington, Andrews, & Catlin, 2014). Females accounted for 56% of spending in 2010, $7,860 per person, which was 25% more per capita than males (Lassman et al., 2014). However, growth in spending is higher among males, which may be in part due to increases in prescription drug use (Lassman et al., 2014). States also vary in per capita health care expenditures. In 2009, the highest was $9,278 per capita in Massachusetts and the least $5,031 in Utah (Kaiser Family Foundation, 2016a). Furthermore, the costs of medical procedures vary across geography. For example, Newman, Parente, Barrette, and Kennedy (2016) observed commonly performed procedures such as pregnancy ultrasounds can be as much as three times higher between cities just 60 miles apart.

What Drives Spending on Health Care?

Circulatory system conditions accounted for 17% of personal health spending in 2005 and was the health condition associated with the largest source of growth from 1996 to 2005 (Roehrig, Miller, Lake, & Bryant, 2009). Direct costs of health care for cardiovascular conditions is estimated to be over $324.1 billion (American Heart Association, 2010). Chronic conditions contributed to an overall rise in out-of-pocket spending from 1996 through 2005 regardless of sex, race/ethnicity, and income and from middle-age onward (Paez, Zhao, & Hwang, 2009). Chronic diseases not only have high direct costs, but can also increase the costs of other complications the disease creates. For example, in 2005 spending on diabetes treatment was $27.9 billion; however, spending by people with diabetes was $190.4 billion (Roehrig et al., 2009). The rise of new treatments and expanded definitions of who should be treated have also increased spending on chronic conditions, most notably cholesterol (Roehrig et al., 2009).

Research Questions

Specifically, we sought to address the following research questions:

RQ 1: What are the patterns of the payments for medical expenses and health insurance premiums of consumers?

RQ 2: Who pays more for medical expenses and health insurance premiums?

RQ 3: What are the roles of sociodemographic factors in predicting the payments for medical expenses and health insurance premiums?

Methods

Data and Sample

This study used the publicly available dataset drawn from the 2014 Consumer Expenditure Survey (CE) for nationally representative of the U.S. civilian population. The CE consists of two surveys, the Quarterly Interview Survey and the Diary Survey, which provide information on the buying habits of American consumers, including data on their expenditures, income, and consumer unit (CU, families, and single consumers) characteristics. The U.S. Census Bureau collected the survey data for the Bureau of Labor Statistics. We mainly used the Interview Survey, which is a rotating panel basis. After each consumer unit has been interviewed in the sample for five consecutive quarters, it is dropped from the survey, and a new address is selected to replace it.

Reference person is the first member mentioned by the respondent when asked to "Start with the name of the person or one of the persons who owns or rents the home." It is with respect to this person that the relationship of the other consumer unit members is determined. A consumer unit comprises either (a) all members of a particular household who are related by blood, marriage, adoption, or other legal arrangements, (b) a person living alone or sharing a household with others or living as a roomer in a private home or lodging house or in permanent living quarters in a hotel or motel, but who is financially independent, or (c) two or more persons living together who use their income to make joint expenditure decisions. Financial independence is determined by the three major expense categories: Housing, food, and other living expenses. To be considered financially independent, at least two of the three major expense categories have to be provided entirely, or in part, by the respondent.

For this study, we used the CE dataset collected between the first quarter of 2014 and the first quarter of 2015. The total number of consumer units during this period is 32,321. We excluded 8,425 cases with missing data on main independent variables, sociodemographic variables (i.e., age, family size, family salary income, gender, number of owned vehicles, marital status, homeownership, educational attainment, race, region, Metropolitan Statistical Area (MSA),

having children under 18 years old, and having adults over 64 years old). With these exclusions, 23,896 consumer units are included in this analysis.

A detailed description of the sample is presented in Table 1. Most of the respondents in this study were White (82.8%), married (54.8%), currently working (68.6%), and privately employed individuals (73.7%). The age of the reference person ranged between 16 and 87, with a mean age of 51.5 years old. The sample included slightly more females (51.7%) than males (48.3%). With respect to employment, a mean of weekly work hours was 40.7. The mean of family size was 2.5 persons, 16.2% had children less than 18 years old, and 20.3% had adults over 64 years old in the household. Regarding homeownership, 69.9% owned a home, whereas 30.1% indicated rented or other arrangement. 87.9% of respondents reside inside a Metropolitan Statistical Area (MSA) and the average of the number of owned vehicles was two. The average of annual family salary income was $51,832 and the median was $33,000. Family salary income is the amount of wage and salary income, before deductions, received by all CU members in past 12 months.

Measures

The dependent variables of this study are the amount paid for health insurance premiums and the amount of payments for medical expenses. The payments for medical expenses include eye care service (i.e., eye examinations, treatment, or surgery, purchase of eye glasses or contact lenses), dental care, hospital care and physicians' services, medical care services (i.e., lab tests or x-rays, care in convalescent, or nursing home), medicine and medical supplies (i.e., hearing aids, prescription drugs, rental/purchase of supportive or convalescent equipment, rental/purchase of medical or surgical equipment for general use), care for invalids, convalescents, handicapped, or elderly persons at home, and adult day care centers.

Our review of literature identified that health insurance spending is generally a function of demographic and socioeconomic characteristics, which we included as independent variables. Demographic characteristics included in the study are age, gender, race, educational attainment, Metropolitan Statistical Area (MSA), region, employment status, weekly work hours, and marital status of reference person. In addition, family size, having children under 18

TABLE 1. Sample Descriptive Statistics (*N* = 23,896)

Category	Percent or Mean (Median)	
Age	51.5 (52) years old	
Family size	2.48 persons	
Gender	Male	48.3%
	Female	51.7%
Marital status	Married	54.8%
	Other[a]	45.2%
Race	White	82.8%
	Black	9.7%
	Other[b]	7.5%
Educational attainment	Less than high school	8.3%
	High school	22.9%
	Some college	30.7%
	Bachelor's degree	23.3%
	Grad/Prof degree	14.7%
Metropolitan Statistical Area	Yes	87.9%
	No	12.1%
Region	Northeast	19.2%
	Midwest	23.2%
	South	33.4%
	West	24.2%
Employment	Privately employed	73.7%
	Government employed	17.1%
	Self employed	9.2%
Weekly work hours	40.7 hours	
Homeownership and mortgage debt status	Owned with mortgage	42.0%
	Owned without mortgage	27.9%
	Non-homeowner[c]	30.1%
Family salary income	$51,831.61 ($33,000)	
Number of owned vehicles	1.97 vehicles	
Having children under 18 years old	Yes	16.2%
	No	83.8%
Having adults over 64 years old	Yes	20.3%
	No	79.7%

[a]Included widowed, divorced, separated, and never married.
[b]Included Asian, Native American, Pacific Islander, and Multirace.
[c]Included rented, occupied without payment of cash rent, and student housing.

years old, and having adults over 64 years old are included. Financial factors included in this study are log of family salary income, homeownership and mortgage debt status, and the number of owned vehicles.

Data Analysis

One-way analysis of variance (ANOVA) using Duncan's post-hoc test was employed to investigate what household characteristics are associated with the amount of health insurance premiums and the payments for medical expenses. Also, *t*-tests were used to evaluate differences in health insurance premiums and medical expenses. Multivariate analysis using Ordinary Least Square (OLS) regression was utilized to test potential effects of household characteristics variables on the amount of the health insurance premiums and the payments for medical expenses.

Results

Patterns of the Payments for Medical Expenses and Health Insurance Premiums

We were able to analyze total of 18,080 CUs for health insurance premiums and 15,320 CUs for medical expenses due to nonresponse CUs for health care spending (i.e., 24.3% did not report the amount paid for health insurance premiums and 35.9% did not report the payment for medical expenses among 23,896 CUs). The respondents reported that the average quarterly amount paid for health insurance premiums was $1,002.68 and the median amount was $709. Also, the respondents reported that the average quarterly amount of the payments for medical expenses was $523.16 and the median amount was $200.

The most common types of insurance plan were health maintenance organization (39.2%) and fee for service plan (39.7%) such as traditional fee for service plan or preferred provider option plan. In addition, 13.7% had other special purpose plan such as dental insurance, mental health insurance, vision insurance, and prescription drug insurance. 64.9% of the respondents reported that they obtained the policy on group through place of employment, 24.6% did individually, and 10.5% did group through other organization. Most health insurance premiums were paid through payroll deductions.

One-way ANOVA indicated significant differences between groups in regards to type of insurance plan and whether the policy was obtained on an individual or group basis (see

Table 2). That is, the groups who had health maintenance organization ($1,005.56) and fee for service plan ($1,056.30) spent more on health insurance premiums than the groups who had commercial Medicare supplement type ($817.31). Interestingly, compared with the households who had fee for service plan ($555.72) or other special purpose plan ($556.21), the households who had health maintenance organization type ($469.19) spent less for medical expenses. Additionally, compared with the households who obtained the policy through group or other organizations, households with individual policies spent more on both health insurance premiums and the payments for medical expenses.

Moreover, this study examined the enrollment status of Medicare and Medicaid. 28.2% of the respondents reported that they or any members of their CU were presently enrolled in Medicare or had been enrolled in Medicare. While, only 8.9% reported that they or some people in their CU were enrolled in Medicaid.

Who Pays More for Medical Expenses and Health Insurance Premiums?

One-way ANOVAs and *t*-tests were used to examine the relationship between the amount paid for health insurance premiums and the amount of the payments for medical expenses and household characteristics, revealing significant differences between the groups (see Table 3). The *t*-tests revealed differences in the mean health insurance premiums in terms of gender, Metropolitan Statistical Area (MSA), and marital status. While, *t*-tests revealed differences in the mean of medical expenses in regards to marital status only. Specifically, married respondents spent more on health insurance premiums and medical expenses. Also, the residents inside of MSA spent more on health insurance premiums but there was no significant difference in the payments for medical expenses.

In addition, one-way ANOVAs indicated significant differences between groups in regards to region, race, employers, homeownership and mortgage debt status, and educational attainment with a post-hoc analysis using Duncan's procedure. In particular, Midwestern residents spent less on health insurance premiums payments while Northeastern residents spent less on payments for medical expenses. With regards to race, Blacks spent less and Whites spent more on health insurance premiums and medical expenses. In terms of employment, government

TABLE 2. Patterns of Health Insurance Premiums and Medical Expenses

Variables		Percent or Mean (Median)
Medical expenses (*n* = 15,320)		
Amount of the payments for medical expenses (per quarter)		$523.16 ($200)
Health insurance premiums (*n* = 18,080)		
Amount paid for health insurance premiums (per quarter)		$1,002.68 ($709)
Type of insurance plan	Health maintenance organization	39.2%
	Fee for service plan	39.7%
	Commercial Medicare supplement	7.4%
	Other special purpose plan[*]	13.7%
Special purpose insurance plan[*]	Dental insurance	5.8%
	Vision insurance	2.8%
	Prescription drug insurance	1.1%
	Mental health insurance	4.0%
	N/A	86.3%
Policy was obtained on an individual or group basis	Individually obtained	24.6%
	Group through place of employment	64.9%
	Group through other organization	10.5%
The premiums paid through payroll deduction	Yes	49.1%
	No	28.3%
	N/A	22.6%
Medicare and Medicaid enrollment (*N* = 23,896)		
Medicare enrollment	Yes	28.2%
	No	7.1%
	N/A	64.7%
Medicaid enrollment	Yes	8.9%
	No	26.8%
	N/A	64.3%

employees spent less and the self-employed spent more on both health insurance premiums and payments for medical expenses. In addition to employment, homeownership and educational attainment were associated with both health insurance premiums and payments for medical expenses. Compared with other groups, homeowners and higher educational attainment respondents spent more on both health insurance premiums and payments for medical expenses.

Factors Associated With Medical Expenses and Health Insurance Premiums
Using OLS regression analyses, we examined demographic and financial factors associated with health insurance premiums and the payments for medical expenses.

The analyses revealed that the proposed model provided a satisfactory fit to the data (see Table 4). The *F*-test indicated that the combined effects of the independent variables were related significantly to the amount of health insurance premiums and the payments for medical expenses at the 0.1% level or better. The results indicated that age, being married, educational attainment, and log of family salary income were positively associated with the amount paid for both health insurance premiums and medical expenses. Family size was only positively associated with the amount paid for health insurance premiums, while homeownership without mortgage and the number of owned vehicles were only positively associated with the amount paid for medical expenses.

TABLE 3. The *t*-test and One-Way ANOVA Results Regarding Health Insurance Premiums and Payments for Medical Expenses

Variables		Health Insurance Premiums (*n* = 18,080)				Payments for Medical Expenses (*n* = 15,320)			
***t*-test**		*M*	*SD*		*t*	*M*	*SD*		*t*
Gender	Male	1022.59	1165.86		2.243*	538.28	1181.39		1.485
	Female	983.96	1148.31			510.19	1150.11		
Marital status	Married	1216.72	1294.30		30.454***	622.94	1285.48		13.246***
	Other[a]	697.50	836.83			369.21	927.96		
Metropolitan Statistical Area	Yes	1021.52	1177.84		5.870***	519.38	1091.97		−0.819
	No	867.53	984.26			550.93	1600.98		
One-way ANOVA		*M*	*SD*	Duncan	*F*	*M*	*SD*	Duncan	*F*
Region	Northeast	1103.13	1375.07	c	15.305***	480.50	1077.54	a	4.958**
	Midwest	943.09	1021.06	a		543.40	1131.34	b	
	South	968.62	1069.20	a		490.71	1031.62	a	
	West	1039.67	1224.72	b		566.82	1284.73	b	
Race	White	1023.50	1173.68	b	29.829***	547.52	1204.45	c	24.382***
	Black	797.96	986.68	a		308.89	745.18	a	
	Other[b]	1032.40	1142.56	b		449.11	988.12	b	
Employment	Privately employed	992.06	1165.23	b	27.632***	494.12	1010.75	b	97.236***
	Government employed	876.25	916.23	a		413.56	704.73	a	
	Self-employed	1453.43	1595.67	c		700.59	1260.48	c	
Homeownership and mortgage debt status	Owned with mortgage	1104.87	1208.51	c	110.390***	549.38	1054.84	b	61.858***
	Owned without mortgage	1023.41	1168.13	b		619.33	1485.19	c	
	Non-homeowner[c]	791.30	1010.57	a		339.78	806.70	a	
Educational attainment	Less than high school	827.59	965.81	a	37.858***	375.57	923.34	a	12.137***
	High school	906.32	1046.16	b		453.34	934.53	b	
	Some college	964.96	1079.85	b		524.46	1306.68	c	
	Bachelor's degree	1069.98	1240.26	c		577.11	1254.81	c d	
	Grad/Prof degree	1187.42	1348.83	d		599.43	1111.69	d	

(Continued)

TABLE 3. The *t*-test and One-Way ANOVA Results Regarding Health Insurance Premiums and Payments for Medical Expenses *(Continued)*

Variables		Health Insurance Premiums ($n = 18,080$)				Payments for Medical Expenses ($n = 15,320$)			
		M	SD	Duncan	F	M	SD	Duncan	F
One-way ANOVA									
Type of insurance plan	Health maintenance organization	1005.56	1233.47	b c	19.438***	469.19	1191.05	a	6.078***
	Fee for service plan	1056.30	1203.48	c		555.72	1146.68	b	
	Commercial Medicare supplement	817.31	839.39	a		526.34	1246.01	a b	
	Other special purpose plan	948.70	951.91	b		556.21	1097.91	b	
Policy was obtained on an individual or group basis	Individually obtained	1035.03	1191.28	b	4.629**	565.80	1314.30	b	4.390*
	Group through place of employment	998.40	1120.32	b		514.58	1122.13	a b	
	Group through other organization	926.79	1356.15	a		469.21	1019.64	a	

*$p < .05$. **$p < .01$. ***$p < .001$.

[a]Included widowed, divorced, separated, and never married.

[b]Included Asian, Native America, Pacific Islander, and Multi-race.

[c]Included rented, occupied without payment of cash rent, and student housing.

TABLE 4. Multivariate Ordinary Least Squares (OLS) Regression Results on Health Insurance Premiums and Payments for Medical Expenses

Variables	Health Insurance Premiums (n = 18,080)		Payments for Medical Expenses (n = 15,320)	
	Coefficient	SE	Coefficient	SE
(Constant)	−651.602***	158.980	−328.439*	150.249
Age	6.821***	1.117	4.359***	1.061
Family size	119.782**	16.533	3.133	15.915
Married	266.566***	29.210	152.685***	28.155
Male	−7.166	24.368	−27.138	23.216
Race (ref. = White)				
Black	−58.134	40.351	−63.116	42.932
Other[a]	−34.618	46.245	−104.317*	44.550
Educational attainment (ref. = < High school)				
High school	79.207	59.837	94.954	61.107
Some college	39.551	58.177	127.810*	59.219
Bachelor's degree	131.479*	59.222	162.275**	60.335
Grad/Prof degree	216.451***	63.072	195.293**	62.834
Region (ref. = West)				
Northeast	35.539	37.624	−112.264***	34.293
Midwest	8.609	34.794	−63.167	32.669
South	73.824*	32.456	−16.736	30.719
Homeownership (ref. = Owned with mortgage)				
Owned without mortgage	26.297	32.446	74.371*	29.826
Non-homeowner[b]	−47.243	30.249	−19.745	29.938
Employment (ref. = Privately employed)				
Government employed	−140.804***	31.214	−72.273*	28.277
Self-employed	63.027***	48.520	127.758**	44.614
Weekly work hours	−1.651	1.094	1.265	1.014
Log of family salary income	75.105***	13.568	29.162*	12.782
Number of owned vehicles	11.050	8.866	25.708***	7.987
Having children under 18	−37.197	35.285	.611	33.531
Having adults over 64	−149.139***	42.684	−62.466	38.264
R^2 (Adjusted R^2)	0.092 (0.089)		0.035 (0.032)	
F	37.994***		10.887***	

*$p < .05$. **$p < .01$. ***$p < .001$.
[a]Included Asian, Native American, Pacific Islander, and Multirace.
[b]Included rented, occupied without payment of cash rent, and student housing.
ref. = reference category.

Conversely, government employment status was negatively associated with both health insurance premiums and medical expenses. In particular, the findings showed that, compared to private sector employees, the self-employed spent more and government employees spent less on health insurance premium and medical expenses. In addition to employment status, region was associated with medical expenses, which explains some of the relationship between health insurance premiums and medical expenses. Compared with the households living in the West, the households living in Northeast paid lower medical expenses. Further, having adults over 65 years or older in the household was negatively associated

with health insurance premiums. However, the association between having adults 65 years or older in the household and medical expenses was not statistically significant.

Discussions

This study sought to investigate household sociodemographic characteristics as predictors of patterns of health insurance premiums and medical expenses of consumers using 2014 the Consumer Expenditures Survey. The average quarterly amount paid for health insurance premiums was $1,003 and the median amount was $709. The average quarterly amount of the payments for medical expenses was $523 and the median amount was $200. The most common types of insurance plan were health maintenance organization and fee for service plans. The households who had health maintenance organization plans spent more on health insurance premiums but spent less on the payments for medical expenses. Nearly two-third of households obtained the policy on group through place of employment. The households which individually obtained policies spent more on both health insurance premiums and the payments for medical expenses.

This study has shown that sociodemographic characteristics are correlated with health care spending. It has provided empirical support to testimonial evidence that an older age, being married, educational attainment, and log of family salary income are associated with higher family spending on both health insurance premiums and medical expenses. Interestingly, family size was only positively associated with the amount paid for health insurance premiums. The findings of this study are consistent with past research on health care expenses (Hong & Kim, 2000; Kaiser Family Foundation, 2012; Lassman et al., 2014). Homeownership without mortgage and the number of owned vehicles were only positively associated with the amount paid for medical expenses.

On the other hand, government employment status was associated with lower spending on both health insurance premiums and medical expenses, while the self-employed spent more on health insurance premium and medical expenses since they have limited choices and are not able to take advantage of collective bargaining power in purchasing health insurance policies (Hong & Kim, 2000).

Finally, region is also associated with health care spending. Since Wennberg and Gittelsohn's (1973) research, many researchers have discussed regional variation in health

care. Particular attention has been paid to differences seen in health care spending, health insurance coverage, and health-care access for both children (Kogan et al., 2010; Fisher-Owens et al., 2016) and adults (Radley & Schoen, 2012; Ozieh, Bishu, Walker, Campbell, & Egede, 2016) by geographic variation. We found that compared to the households living in the West, Southern residents paid higher health insurance premiums while Northeastern residents paid lower medical expenses.

Limitations and Future Directions

The findings must be considered within the context of its limitations. Some limitations of this study were primarily data restrictions. Out-of-pocket costs for medical expenses vary for families based primarily on health status and health insurance coverage (Kaiser Family Foundation, 2012). We were not able to include health factors such as health status or need for health care in this analysis since the CE survey data did not cover respondents' health information. We recognize that one of the most important factors associated with health care utilization is health status or need for health care. Further investigation could look into the health related variables for predicting health care. Health insurance also enables individuals and families to access health care. Health insurance coverage status impacts the out-of-pocket costs for medical expenses. Therefore, future research should control the health insurance coverage status to predict medical expenses. In addition, as noted above, further studies are needed to strengthen the current findings and correct for nonresponse bias, in particular studies in health care spending since there are substantial nonresponses to the amount paid for health insurance premiums and medical expenses in a final sample. Although it is beyond the scope of this present study, nonresponse to the U.S. household surveys is increasing and nonresponse might lead to nonresponse bias in survey estimates (Groves, 2006).

On a methodological front, further research might consider the use of longitudinal data because our findings might reflect cohort differences. Given the skewed distribution of expenditures, further research could also be conducted to use alternative estimators such as OLS model with log transformed expenses and two-part models. Though the OLS regression analysis was widely utilized to analyze the expenditure data (e.g., Zan & Fan, 2010; Lou & Holden, 2014), future research might investigate whether there would be a mediating role of possible variables on the

association between households' sociodemographic characteristics and health care spending in a large sample over various time points to seek trends changes since the Patient Protection Affordable Care Act became law.

Furthermore, race/ethnicity and geography might associated with health care spending patterns (e.g., Baicker, Chandra, Skinner, & Wennberg, 2004; American Hospital Association, 2009). Future research might build on our model and expand it to provide a more comprehensive explanation for race/ethnicity differences in health care spending. In particular, more research on the role of race/ethnicity in health insurance premiums might be needed that was uncovered in this study.

Implications for Financial Counselors and Policymakers
This research gauged household characteristics to add something neglected in the previous literature. Findings from this research are informative for both households in determining health insurance premiums and medical expenses throughout the life course as well as financial advisors in personal financial planning and counseling focused on health care. Further, policymakers can also legislatively apply the findings in recognizing the importance of factors associated with household health care decisions and use this information as the basis for providing guidelines for developing recommended strategies to improve health care service use among U.S. populations. Both policy decisions and market dynamics drive regional differences in the amount paid for health care service (American Hospital Association, 2009). In light of the regional variance in health care spending, policy decisions and educational programs might need to be more culturally sensitive to regional differences.

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