The Influence of Individual Characteristics and Early Life Factors on Medicare Spending

Marilyn Moon

Department of Gerontology, American Institutes for Research, USA

Corresponding author:
Marilyn Moon,
Department of Gerontology, American Institutes for Research, USA,
Email: mmoon4817@gmail.com

ABSTRACT

High costs in health care of United States make it difficult for individuals to afford their care and for government and businesses to subsidize through insurance and government programs especially Medicare. This paper explores whether personal characteristics and events in childhood affect health care costs later in life. We link a unique national survey dataset on nearly 400,000 American high school students in 1960 to Medicare administrative records in 2012 and take an initial look at possible linkages between these early life variables and Medicare expenditures 50 years later. We find that early life cognitive, health, geographic residence and socio-economic status can help to explain differences observed in Medicare spending. This knowledge may help both in suggesting policy interventions to affect key early life variables and to suggest where there may be legitimate differences in spending that we should not expect to eliminate.

INTRODUCTON

The cost of health care spending is of great concern in the United States: high costs make it difficult for individuals to afford their care and for government and businesses to subsidize these costs through insurance and government programs. And when examining health spending, variations in spending across people who would appear to have very similar needs for care can be very large indeed. It is often suggested that reducing such variation is one way to slow the growth in spending [1-3]. Studies that have attempted to analyze these differences find that much remains unexplained [4,5]. Consequently, researchers are interested in finding what factors contribute to these differences, whether they represent valid differences in health care use, and how that knowledge could translate into policies to reduce that variability.

Many researchers have hypothesized that early life experiences, health challenges, personal attitudes and other factors may influence later use of health care services [6,7]. What health problems arise early in life that may influence later spending? Can costs be mitigated—both when individuals are young and as they age? Do family conditions, personality traits or school achievement shape attitudes about health care use that may explain part of the variations in spending? If so, does it make sense to try to reduce variations? Do early health problems rise later spending? What environmental factors (such as air and water quality that could be mitigated) explain variation? These issues pose tantalizing questions that need to be studied to understand later life experiences and that may indicate whether early investments in

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children can pay dividends in lower health care costs not just over a short period of time but across the lifespan.

It is not easy, however, to study such early life experiences in the context of later health care use and spending. Few studies track individuals across a lifetime—and those that do tend to be either of very small scale or limited to certain particular subsets of the population. Those that are available have suggested that this may be a rich area for research—if only more data existed [8-10]. This paper examines results from a large 1960 data base merged with 2012 Medicare data to provide some initial insights into whether more in-depth analysis would be fruitful.

In 1960, the Department of Health, Education and Welfare funded the American Institutes for Research to conduct a survey of nearly 400,000 high school students in 1,300 schools (amounting to a 5% representative sample of high school students across the United States and almost impossible to imagine replicating today) and collected massive amounts of information on school achievement, family history, personality traits, and other key information. Thus, this survey contains information on both early life experiences but also on traits not often available from other sources such as personality and family background. The original goal of the study—called Project Talent [11] (PT) -- was to track the impact of education on these high schoolers' later achievements and several smaller scale follow-up surveys were completed. But funding was limited after the initial massive analysis and the last formal government funded follow-up was in the mid-1970s. But because information on names, birthdates, and in some cases, Social Security numbers were kept, it is now possible to follow up on these individuals. We have linked these survey results to Medicare administrative records for about 132,000 people, allowing us to take an initial look at possible linkages between key variables from early in life and Medicare expenditures. In many ways, we think of this analysis as a "proof of concept" to justify further, more in depth examinations, although even in this preliminary work, we have found several interesting areas for further exploration.

STUDY DATA AND METHODS DATA

How do we go from the 400,000 early records to 132,272 and then the smaller number of records used in this study?

First, we did not attempt to match all records from Project Talent; we are using several randomly selected subsets of this population in other studies and hence they are excluded from this analysis, in part to assure that individuals cannot be identified. Second, not all records submitted to the Medicare administration yielded linkages resulting in a strong match, in part because we know that a number of people have died based on earlier work conducted using the National Death Index. As Figure 1 indicates, we successfully matched 132,272 cases for analysis. There is some bias in who can be located; in particular, women whose names change at marriage are somewhat more difficult to locate. We recognize, however, that these findings cannot currently be generalized to the full Medicare population as a whole because our sample is weighted to capture those in high school in 1960 [12]. Those who dropped out of school and immigrants arriving later will not be captured, for example. Nonetheless, we believe that our findings are generally representative of this cohort of the Medicare population.

For our study—in which we focus on Medicare spending—it is also necessary to eliminate some of the matched cases. In particular, a substantial minority of individuals enroll in Medicare Advantage, the optional Medicare program in which people can opt to get their care from private insurance with Medicare paying a monthly stipend to the insurance company. In that case, there is no information on health care spending since private plans do not report what they pay for health services. In 2012, 27% of the sample were Medicare Advantage enrollees, which is consistent with the national data on 2012 Medicare beneficiaries [13]. For people in traditional Medicare, the federal government effectively acts as the insurer and hence data are available on spending by type of service. We have Medicare data for 2012 when the individuals in the study are largely aged 66 to 70.

Finally, some of the variables of interest to us from Project Talent are missing responses and hence we delete these individuals from our study. As shown in Figure 1, that leaves a final sample of 68,881 people.

DEVELOPING THE MODEL

We know from other studies that health care spending differs substantially by age, gender, race and other personal characteristics and by geographic region. All of these variables are available from Medicare administrative records. While income or other financial variables can also be important, they

are not available from Medicare data. We do know whether individuals receive Medicaid—which is a proxy for very low income and for the presence of supplemental insurance [14]. Another variable from Medicare of interest is source of original eligibility which tells us whether the individual qualified for Medicare as disabled. This captures presence of serious health issues before age 65. Finally, we use the chronic conditions file developed by Medicare that indicates whether the beneficiary has various chronic conditions; we have particularly focused on cancer, heart disease, and diabetes as conditions that drive spending higher—particularly for the younger Medicare population that constitutes our sample. Other chronic conditions are combined as an additional variable.

To these basic Medicare variables, we have added a set of Project Talent variables focusing on early socio-economic (SES) and health status, intellectual ability and personality traits. Family income and father's education are the major indicators of SES we use, but we have also included mother's education because studies have suggested this is an important factor in development and later use of health services [15-18]. Intellectual ability is captured by reported IQ and verbal ability. We use four major health variables from 1960: asthma, obesity, sick in bed for more than 5 times in the last year, and whether the person had health problems before the age of ten. The first two variables are ones that some literature has suggested may be important later in life. Asthma has been linked to other respiratory problems [19] and obesity is thought to complicate other health conditions or even contribute to their onset [20] (such as with Type 2 diabetes). The other two variables are self-reported general indications of health problems both recently and earlier in life. The personality traits, defined in Table A1, reflect 10 constructed indices derived from a range of questions on the initial survey. Although it is also possible to translate these into a more commonly used 5-trait battery, we have chosen to use the 10 traits developed for Project Talent because several of them seem particularly relevant and showed good internal consistency reliability and predictive validity [21].

Geographic region—available to us both from 1960 and 2012--is another key variable that should have strong correlation with health care spending for a number of reasons. First, prices of care can vary substantially by region. High cost areas tend to have higher prices attached to health care services. But in addition, use of services also varies by more geographically than can be explained from differences in population characteristics. Attitudes about the value of health services, supply of health providers, differences in health delivery practices, and air and water quality may also be captured in the geographic variables. We have only begun to tap the surface in our analysis but as discussed below; our findings indicate that much more could be done to examine these important issues.

For our geographic analysis, we have used both region variables when the individual was in high school and region at time of Medicare expenditure. There are interesting patterns of who has moved and who has not between these two periods [22]. Mobility itself may also be important. For example, new findings on financial achievement have been linked to mobility—especially as people are able to move out of depressed areas [23-25]. As Table 1 indicates, those residing in the South and West in 1960 are more likely to be in the same region in 2012. Those in the Northeast and Midwest are more likely to have moved to another region, increasing the size of the population in the South and West. We also have a variable indicating whether residence in 1960 was in a rural area.

Together, these variables add more detail on the background of Medicare beneficiaries that may help to explain differences in use of services. Some may be amenable to policy interventions, but all may be helpful in understanding why spending on care varies so much.

We divide our sample depending upon whether people died in 2012-2014, or survived (at least through 2014). We put those who die anytime during the period 2012 through 2014 into a separate analysis file. Studies indicate that people in the last two years of life spend substantially more than others and personal characteristics and health conditions may differentially affect that spending systematically [26]. Indeed, as noted below, the results looking at survivors do vary versus decedents. It is interesting to speculate whether spending at the end of life is more or less discretionary. That is, seriously ill patients may not be in a position to question the care they are receiving. On the other hand, decisions to forego care at the end of life—opting for

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hospice or simply declining aggressive treatments—may be highly correlated with individual characteristics and attitudes. To attempt to differentiate between discretionary and more urgent health care decisions, we separately modeled expenditures on acute services and those on non-acute services, as well as total expenditures. In doing so, we were attempting to isolate spending differences that might reflect discretionary decisions. Acute care spending includes acute hospitals and critical access hospitals. Non-acute spending includes all other Medicare spending (except for Part D drugs which are excluded since a large portion of

beneficiaries do not enroll in the optional drug plan and that would further limitthe sample). We assume that hospitalization is much less of a "choice" made by patients than are doctor visits or use of therapy and post-acute services. To the extent that our early life variables indicate attitudinal or personality differences, these are more likely to influence discretionary spending than spending that results from an acute illness or trauma.

For the most part we have employed a simple multiple regression analysis with a few adjustments reflecting the important characteristics of the data. Spending is log-transformed since spending is not a normal distribution and is skewed in this sample.

Table 1: Geographic Residence.						
PT 1960 Region	Medicare 2012 Region					
	Northeast	Midwest	South	West	Other Region	Cumulative %
Northeast	16.3%	1.1%	6.1%	2.3%	0.1%	25.9%
Midwest	1.2%	23.9%	7.7%	4.1%	0.1%	36.9%
South	0.8%	1.3%	24.1%	1.7%	0.1%	27.9%
West	0.2%	0.4%	1.0%	7.6%	0.1%	9.3%
Cumulative %	18.4%	26.7%	38.9%	15.6%	0.4%	100%
Total Observations	12,679	18,407	26,791	10,736	268	68,881

STUDY RESULTS

Table 2 shows how average health care spending varies by survival status and region of the country and Table 3 captures per capita health spending across various conditions in 2012. As indicated, there is substantial difference in these amounts, particularly for non-acute care. Certainly, current condition health condition is a major factor in spending differences.

Table 4 provides means of the some key variables used in the model. We have, as expected, fewer women than men although a fully representative sample for this group would have more women than men. Residence is higher in South and Midwest regions and 13 percent resided in rural areas in 1960. Family income was reasonably spread across a wide range of categories. In terms of health problems, the number of people with cancer is relatively small—reflecting the younger age of this group than for Medicare beneficiaries in general. The prevalence of heart disease and diabetes, on the other hand, is quite high with 22 percent and 19 percent of respondents falling into these two groups respectively.

Table 5 provides our regression results for the two types of spending as well as total spending per capita. We also provide separate results for survivors and decedents and

results for a smaller sample of spending including prescription drugs for those enrolled in Part D in the appendix.

While these results should be viewed as findings that may merit further, more intensive analysis, there are a number of results that will likely stand the test of further analysis. As expected, age, gender and health condition are strongly significant in our analysis. These are the major determinants of spending differences.

But also consistently significant is geographic region. Geographic region is significant whether based on current region or on residence during high school. Using the 1960 data, discretionary spending is highest in the South and overall, the South and Midwest have higher levels of overall spending --17% higher compared to the Northeast. This, in particular, is an area that needs follow up analysis to further disaggregate the regions and to test whether particular factors such as air quality or price differences drive the results.

Women spend more on care than men overall, but less on acute care. Age, as expected, is positively correlated with spending. All of the health conditions raise overall spending with the exception of Alzheimer's disease. Cancer, in particular, is

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associated with greater spending, including both discretionary and acute expenditures.

Some of the personality traits measured in high school was also consistently strong in explaining spending differences. In particular, sociability and impulsiveness are the most significant traits. Being more sociable is correlated with higher spending while impulsiveness lowers spending. Vigor and social sensitivity also are significant at the 5% level. For example, one grade higher in the vigor measure was associated with 1.35% higher total Medicare spending, and this effect was consistent with all types of Medicare spending. Higher grade in self-confidence and social sensitivity was associated with lower total and non-acute Medicare spending. These variables—as well as a number of other Project Talent variables—are more likely to be significant for the non-acute spending, i.e. the more discretionary expenditures by individuals. They are also less likely to matter for decedents than for survivors—again likely reflecting some differences in discretion.

Surprisingly, neither obesity nor asthma in adolescence was strongly significant in explaining differences in health care spending. If we were focusing only on people with particular conditions that we believe are linked to these early characteristics, the findings might be stronger. But respiratory disease and diabetes, for example, tend to drive use of health care services so it is interesting that these variables do not seem to matter. The two self-reported health problem variables are more important; but while they tend to be significant, their impact is in the opposite direction of what might be expected. Early health problems are correlated with lower, not higher spending.

Mother's education is a variable suggested by a review of the literature that does hold up in our analysis. It is usually significant as an explanator of spending. And it is more likely to be important than the income variable from high school. Similarly, IQ is not a very good explanator of spending.

Table 2: Medicare Spending Per Capita by Region and Status.			
PT 1960 Region	Total Medicare Spending Per Capita	Non-acute Care Spending Per Capita	Percentage
Northeast			25.9%
Alive in 2012-14	$4,053	$2,838	
Died in 2012-14	$28,478	$15,788	
Midwest			36.9%
Alive in 2012-14	$4,205	$2,880	
Died in 2012-14	$27,102	$14,813	
South			27.9%
Alive in 2012-14	$4,220	$3,013	
Died in 2012-14	$28,256	$15,976	
West			9.3%
Alive in 2012-14	$3,868	$2,668	
Died in 2012-14	$25,708	$15,681	
Movers			28.1%
Alive in 2012-14	$3,917	$2,787	
Died in 2012-14	$26,393	$14,459	
Non-movers			71.9%
Alive in 2012-14	$4,225	$2,925	
Died in 2012-14	$28,110	$15,838	
Total			100%
Alive in 2012-14	$4,138	$2,886	
Died in 2012-14	$27,650	$15,468	

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Table 3: Medicare Spending Per Capita by Selected Conditions and Status.			
Condition	Total Medicare Spending Per Capita	Non-acute Care Spending Per Capita	Freq.
Diabetes			
Alive in 2012-14	$7,566	$5,107	14464
Died in 2012-14	$36,690	$19,861	1288
Breast Cancer			
Alive in 2012-14	$7,844	$6,047	2397
Died in 2012-14	$45,052	$27,778	182
Colorectal Cancer			
Alive in 2012-14	$12,263	$7,888	720
Died in 2012-14	$46,022	$29,516	135
Prostate Cancer			
Alive in 2012-14	$7,225	$5,271	2312
Died in 2012-14	$28,790	$18,111	157
Lung Cancer			
Alive in 2012-14	$15,729	$11,149	339
Died in 2012-14	$40,588	$24,641	277
Endometrial Cancer			
Alive in 2012-14	$12,133	$48,444	282
Died in 2012-14	$8,349	$25,926	42
Alzheimer			
Alive in 2012-14	$10,769	$8,564	433
Died in 2012-14	$33,823	$20,991	163
Total Analysis Sample			
Alive in 2012-14	$4,138	$2,886	65831
Died in 2012-14	$27,650	$15,468	3050

Table 4: Descriptive Statistics of Key Covariates, N=68,881.		
Independent Variables		Mean
Age		68.55(1.21)
Female		50.6%
Race		
	Non-Hispanic white	92.9%
	Black (or African-American)	3.6%
	Asian/Pacific Islander	0.8%
	Hispanic	1.3%
	American Indian/Alaska Native	0.2%
	Other	1.2%
	Family Income in 1960	
	Less than $3,000	4.4%
	$3,000 to $5,999	18.4%
	$6,000 to $8,999	19.3%
	$9,000 to $11,999	9.5%
	$12,000 or more	8.3%
	I can't estimate this	40.2%
	Planned to finish college or more	0.5%
	Had Asthma in Childhood	8.1%
	Obese in High School	1.9%
	Poor Health Before 10yrs Old	5.5%
	Lived in Rural Area in High School	13.0%
	Medicaid Enrollee in 2012	2.5%
	Disease History Recorded in Medicare 2012	
	Heart Diseases	26.1%
	Diabetes	22.9%
	Breast Cancer	3.7%
	Colorectal Cancer	1.2%
	Prostate Cancer	3.6%
	Lung Cancer	0.9%
	Endometrial Cancer	0.5%
	Alzheimer	0.9%
	Died in 2012-14	4.4%

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Table 5: Percentage Change in Medicare Spending Per Capita for Entire Sample, N=68881.							
			Total Medicare Spending		**Non-Acute Care Spending**		**Acute Care Spending**	
PT Personality	Socioability	1.46	**	1.54	**	-0.88	*
	Social sensitivity	-1.59	*	-1.50	*	0.08	
	Impulsiveness	-1.53	*	-1.73	**	-0.39	
	Vigor	1.35	*	1.29	*	1.42	*
	Calmness	0.72		0.78		0.75	
	Tidiness	1.01	*	1.11	*	-0.45	
	Culture	-0.14		-0.29		-0.22	
	Leadership	-0.45		-0.56		1.43	
	Self-confidence	-0.89		-0.94	*	0.56	
	Mature personality	0.01		0.02		-0.54	
	Plan to finish college or +	-1.92		-0.83		-7.56	**
PT Base Year SES	IQ	0.08	*	0.07		0.00	
	Verbal	-0.01		0.00		-0.02	
	Family Income	0.06		-0.06		0.14	
	Father Education	0.37		0.46		-0.05	
	Mother Education	1.35	*	1.21	*	-0.32	
	Obese	-10.04		-9.44		15.65	
	Asthma	0.94		0.07		-0.54	
	Sick 5 times+	-12.14	**	-11.37	**	-8.54	**
	Poor Health before 10yrs old	-13.28	**	-12.87	**	-4.74	
	Rural	18.90	**	18.02	**	2.81	
Geographic Variables	Midwest	17.25	**	15.79	**	16.92	**
	South	17.65	**	17.95	**	3.18	
	West	11.24	*	8.09		24.23	**
	Moved to other regions	-1.89		-1.61		-2.13	
Medicare Variables	Org Medicare Rsn: DIB or ESRD	-20.54	**	-19.09	**	0.40	
	Race: Black	-43.14	**	-44.51	**	1.94	
	Other	-15.70		-12.47		-14.58	
	Asian	-40.88	**	-37.90	**	-29.12	**
	Hispanic	-44.77	**	-45.78	**	-8.15	
	American Indian	-34.91		-47.13	*	22.87	
	Female	68.81	**	75.50	**	-17.97	**
	Age	8.55	**	9.48	**	-3.37	**
	Medicaid	-40.13	**	-36.84	**	5.11	
	#of Other Chronic Conditions	113.18	**	104.04	**	61.12	**
	Heart Diseases	155.66	**	139.01	**	57.45	**
	Diabetes	88.36	**	94.03	**	-17.77	
	Breast Cancer	265.90	**	264.53	**	22.20	**
	Colorectal Cancer	303.55	**	270.57	**	187.81	**
	Prostate Cancer	458.59	**	443.85	**	38.07	**
	Lung Cancer	204.38	**	187.68	**	235.11	**
	Endometrial Cancer	158.22	**	124.95	**	188.25	**
	Alzheimer	-30.09	**	-20.91	*	-45.47	**
	Died in 2012-2014	-4.56		-24.54	**	584.54	**
_cons		-93.88	**	-96.58	**	659.16	**

**Significance levels of 1% and *5% respectively.

DISCUSSION

We conclude that personality traits and early experiences may contribute to explaining health care spending. We found that residence early in life matters as does cognitive and personality development, earlier awareness of health problems, mother's education, and socio-economic status. These influences—and likely others as well—can help to explain some of the differences observed in spending that vary across individuals even after controlling for health status, age, gender and other critical variables. Researchers have long desired to do a better job of understanding why health spending varies. That knowledge can help both in encouraging policies to affect some early life variables such as socio-economic status or treatment of health problems, but also to suggest where there are legitimate differences in spending that we should not expect to eliminate. The goal of simply eliminating variation as a means for controlling costs may not be helpful if differences arise because of traits that are not readily changed. That is, if we want to influence use of health services, we need to be able

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to recognize when use or spending reflects legitimate differences across individuals and when that variation reflects differences that are not desirable. Policy would also be advanced with a better knowledge of how much certain key influences—such as childhood poverty, exposure to various environmental hazards, access to good early health care—can affect spending over a lifetime. Health status and spending for those of Medicare age reflect not just circumstances of the moment but also the cumulative effects of behaviors, environments and attitudes across the life cycle.

More needs to be done in this area. Our study suggests that combining Project Talent and Medicare data may be useful, but onlysets the stage for more intensive work to refine the variables and explore longer periods of Medicare use and spending. For example, a focus on condition specific prevalence and spending would be helpful. Geographic determinants of spending promise to be a particularly important area of further research. These can be studied with the data at hand, and some of the later Project Talent follow-up surveys may be useful as well, although they will reduce the ultimate sample size that now adds to the richness of this data source. As Project Talent participants continue to age, using later years of data will also add to our knowledge. That is, some conditions show up or worsen later in life that we are not able to capture here.

Even after more analysis with Project Talent data, however, there will still be limitations. Ultimately, it would be desirable to have a full life span view. The years after adolescence and before Medicare eligibility obviously include important events. Socio-economic status, health problems, lifestyles are all likely to be important and may help to explain why some of the earlier variables do not have the expected direction or

magnitude of influence. For example, obesity in adolescence might not be important if a person's weight is in the normal range throughout the rest of life. There are some lifecycle studies currently in existences but they are limited in size and sometimes restricted to particularly narrow portions of the population. For example, the Wisconsin Longitudinal Study (WLS) has a similar design and better mid-life measures compared to Project Talent, but its one-state sample with limited racial and ethnic diversity threatens the external validity of this study beyond Wisconsin [27]. Taking advantage of the national large sample in Project Talent, one way to do fill in the gap years and account for missing variables such as smoking behavior would be to mine these current data to identify a key set of important lifetime issues and then survey this population while there are still a large number of these 1960 high school students alive who could fill in some of the gaps in time that could further enrich our knowledge about lifetime determinants of health care spending and health status. If early life conditions—cognitive, health, and socio-economic status, for example—influence health spending over 50 years later, it is reasonable to speculate that investment in children could pay dividends across the lifespan and this study underscores how far into the future the consequences may extend. But we need to know more about whether key variables are amenable to policy changes. For example, is socio-economic status more important than basic personality traits in explaining health care use? How we treat people in terms of financial, educational and health resources generate lasting effects. This is much more than an issue of academic interest; spending on children may well be an investment that could benefit society by generating healthier lives and lower health care spending but that claim needs to be further studied.

APPENDIX

A1. Measures of the Personality Traits from Project Talent[24]	
Name of Personality Trait	**Measure**
Vigor	The physical activity level of a person (e.g., I play games for hours without getting tired)
Calmness	The ability to react to emotional situations in an appropriate manner without displaying extreme emotions (e.g., I rarely lose my temper)
Mature	The ability to get work done efficiently, to work on a project to completion, and to accept assigned responsibility (e.g., I work fast and get a lot done, people say they can count on me)
Impulsiveness	The tendency to make quick decisions without full consideration of the outcomes (e.g., I usually act on the first plan that comes to mind)
Self-Confidence	One's feelings of social acceptability and the willingness to act and think independently (e.g., I'm equal to any occasion)
Culture	The tendency to recognize the value of aesthetic things, and to display refinement and good taste (e.g., I enjoy works of art)
Sociability	The tendency to enjoy being with people as well as to be optimistic (e.g., I take a big part in social activities, I am good natured most of the time)
Leadership	Activities such as taking charge and seeking out responsibilities (e.g., I like to make decisions)
Social Sensitivity	The propensity to put oneself in another's place (e.g., I don't like to see someone's feelings hurt)
Tidiness	The desire for order and neatness in one's environment (e.g., I do my homework as neatly as possible)

A2. Percentage Change in Medicare Spending Per Capita for Survivors before 2015, N=65831							
		Total Medicare Spending		**Non-Acute Care Spending**		**Acute Care Spending**	
PT Personality	Socioability	1.504	***	1.605	***	-0.744	*
	Social sensitivity	-1.556	**	-1.459	**	-0.185	
	Impulsiveness	-1.580	**	-1.758	***	-0.330	
	Vigor	1.439	**	1.361	**	1.309	**
	Calmness	0.462		0.571		0.724	
	Tidiness	0.897	*	0.945	*	-0.586	
	Culture	-0.219		-0.415		0.008	
	Leadership	-0.307		-0.347		0.957	
	Self-confidence	-0.787	*	-0.901	*	0.672	
	Mature personality	0.069		0.100		-0.513	*
	Plan to finish college or +	-2.419		-1.394		-6.903	***
PT Base Year SES	IQ	0.096	***	0.091	**	0.001	
	Verbal	-0.026		-0.015		-0.020	
	Family Income	0.248		0.119		0.129	
	Father Education	0.292		0.298		-0.228	
	Mother Education	1.423	**	1.381	**	-0.151	

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	Obese	-6.961		-7.689		19.050	**
	Asthma	-0.239		-1.105		0.766	
	Sick 5 times+	-11.697	***	-11.086	***	-8.041	***
	Poor Health before 10yrs old	-14.278	***	-14.173	***	-5.079	
	Rural	19.279	***	17.968	***	3.583	
Geographic Variables	Midwest	17.625	***	16.232	***	16.657	***
	South	17.478	***	17.879	***	3.210	
	West	13.631	***	10.112	**	23.490	***
	Moved to other regions	-1.012		-1.108		-1.577	
Medicare Variables	Org Medicare Rsn: DIB or ESRD	-22.373	***	-21.302	***	9.334	*
	Race: Black	-42.981	***	-43.773	***	0.357	
	Other	-19.790	*	-16.614		-15.865	
	Asian	-40.842	***	-37.761	***	-28.406	***
	Hispanic	-44.631	***	-45.625	***	-15.537	**
	American Indian	-34.546	*	-48.841	**	49.046	
	Female	68.119	***	74.565	***	-17.612	***
	Age	8.789	***	9.398	***	-2.170	***
	Medicaid	-40.336	***	-36.821	***	5.698	
	#of Other Chronic Conditions	119.321	***	110.250	***	56.128	***
	Heart Diseases	152.790	***	137.122	***	56.955	***
	Diabetes	88.813	***	93.720	***	-17.728	***
	Breast Cancer	259.968	***	257.498	***	17.171	***
	Colorectal Cancer	277.793	***	246.139	***	157.188	***
	Prostate Cancer	452.677	***	436.964	***	36.763	***
	Lung Cancer	148.982	***	134.559	***	123.680	***
	Endometrial Cancer	140.133	***	122.230	***	156.398	***
	Alzheimer	-41.844	***	-34.035	***	-52.746	***
_cons		-95.137	***	-96.677	***	251.893	**

***Significance levels of 1%, **5%, and *10%, respectively.

A3. Percentage Change in Medicare Spending Per Capitafor People Died in 2012-2014, N=3050							
A3. Percentage Change in Medicare Spending Per Capita for People Died in 2012-2014, N=3050							
		Total Medicare Spending		Non-Acute Care Spending		Acute Care Spending	
PT Personality	Socioability	0.506		0.423		-3.953	
	Social sensitivity	-1.612		-1.607		1.769	
	Impulsiveness	0.893		0.041		-1.550	
	Vigor	-0.486		-0.453		0.921	
	Calmness	5.634	**	4.640		0.753	
	Tidiness	3.557		4.989	*	1.659	
	Culture	0.296		0.893		-1.066	
	Leadership	0.063		-1.241		1.839	
	Self-confidence	-4.851	**	-3.796	*	-0.184	
	Mature personality	-1.020		-1.368		-0.197	
	Plan to finish college or +	5.797		7.725		-8.827	
PT Base Year SES	IQ	-0.197		-0.236		-0.016	
	Verbal	0.323		0.380		-0.158	
	Family Income	-4.194		-4.064		0.280	
	Father Education	2.972		4.964	*	1.266	
	Mother Education	0.834		-1.523		-2.753	
	Obese	-32.170		-18.368		-10.027	

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		Value	Sig	Value	Sig	Value	Sig
	Asthma	19.148		17.308		-10.209	
	Sick 5 times+	-21.515	*	-18.067		-3.453	
	Poor Health before 10yrs old	7.160		14.078		1.079	
	Rural	0.228		7.698		-3.907	
Geographic Variables	Midwest	13.033		10.223		7.408	
	South	26.944		25.287		1.160	
	West	-27.895		-26.016		13.699	
	Moved to other regions	-18.052		-11.255		-3.750	
Medicare Variables	Org Medicare Rsn: DIB or ESRD	5.575		10.888		-25.509	***
	Race: Black	-48.642	***	-55.827	***	1.242	
	Other	62.802		68.581		10.661	
	Asian	-45.257		-44.900		-37.912	
	Hispanic	-11.139		-11.857		55.614	*
	American Indian	-59.661		-53.209		-50.155	
	Female	63.687	***	73.765	***	-3.981	
	Age	0.742		6.784		-6.133	***
	Medicaid	-13.967		-10.467		-12.892	
	#of Other Chronic Conditions	65.937	***	56.968	***	30.261	***
	Heart Diseases	194.850	***	156.728	***	24.889	***
	Diabetes	58.910	***	73.457	***	-1.605	
	Breast Cancer	355.040	***	364.556	***	43.906	***
	Colorectal Cancer	432.526	***	409.885	***	79.692	***
	Prostate Cancer	517.562	***	506.429	***	30.575	
	Lung Cancer	386.983	***	367.112	***	79.133	***
	Endometrial Cancer	343.690	***	160.601	**	91.465	**
	Alzheimer	55.666	**	77.360	***	-1.203	
_cons		3352.891		-50.311		1796.356	***

***Significance levels of 1%, **5%, and *10%, respectively.

A4. Percentage Change in Medicare Spending Per Capita for 2012 Part D Enrollees, N=30162							
		Total Medicare Spending		Non-Acute Care Spending		Acute Care Spending	
PT Personality	Socioability	1.972	***	2.082	***	-0.949	
	Social sensitivity	-1.159	*	-1.177	*	0.519	
	Impulsiveness	-0.015		-0.095		-1.172	
	Vigor	-0.929		-1.041	*	1.647	*
	Calmness	0.253		0.209		1.292	
	Tidiness	0.125		0.115		0.009	
	Culture	0.217		0.292		-1.039	
	Leadership	0.391		0.234		2.532	*
	Self-confidence	0.105		0.132		0.122	
	Mature personality	-0.190		-0.081		-1.122	**
	Plan to finish college or +	2.290		3.628		-9.860	***
PT Base Year SES	IQ	0.112	***	0.114	***	-0.008	
	Verbal	0.065		0.059		0.100	
	Family Income	0.787		0.686		-0.041	
	Father Education	0.387		0.446		-0.110	
	Mother Education	0.377		0.350		-0.568	
	Obese	15.540	*	12.398		38.729	**
	Asthma	2.812		2.922		-0.440	

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	Sick 5 times+	-6.814	**	-5.375	*	-13.584	***
	Poor Health before 10yrs old	-6.042		-5.902		-3.496	
	Rural	4.378		3.521		7.596	
Geographic Variables	Midwest	1.330		-0.379		26.265	***
	South	0.369		0.224		7.120	
	West	6.374		3.154		27.389	***
	Moved to other regions	4.061		4.572	*	-6.225	*
Medicare Variables	Org Medicare Rsn: DIB or ESRD	-11.984	***	-9.465	***	-9.898	***
	Race: Black	-25.757	***	-26.268	***	-4.407	
	Other	-16.662		-13.539		-24.858	*
	Asian	-19.142	*	-13.890		-47.931	***
	Hispanic	-37.773	***	-36.166	***	-21.598	
	American Indian	-39.437		-33.801		-55.397	**
	Female	21.576	***	25.660	***	-17.857	***
	Age	-0.336		0.127		-3.024	**
	Medicaid	-35.219	***	-34.620	***	3.177	
	#of Other Chronic Conditions	58.511	***	52.164	***	68.310	***
	Heart Diseases	82.348	***	70.661	***	74.168	***
	Diabetes	38.170	***	41.768	***	-15.153	***
	Breast Cancer	134.014	***	132.402	***	32.239	***
	Colorectal Cancer	146.305	***	130.273	***	179.100	***
	Prostate Cancer	160.899	***	156.877	***	43.241	***
	Lung Cancer	193.044	***	169.756	***	265.820	***
	Endometrial Cancer	88.076	***	74.392	***	183.356	***
	Alzheimer	-22.407	***	-13.289	*	-55.220	***
	Died in 2012-2014	63.096	***	35.294	***	709.740	***
_cons		15438.393	***	11303.484	***	331.034	

***Significance levels of 1%, **5%, and *10%, respectively.

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