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How does health insurance impact the current health status of a person?

Introduction

Understanding the relationship between health insurance and a person's health status demonstrates how economic inequalities impact the healthcare resources available to people and how that affects their overall health status in the United States of America. The implementation of the Affordable Care Act (also known as the A.C.A. or ObamaCare) as a means of coverage increased the accessibility of healthcare to a significant number of Americans. When the law was enacted on March 23rd, 2010, almost 50 million Americans were uninsured (about 19% of the nonelderly population) and among the uninsured, an estimated 91% held incomes below 400% of the Federal Poverty Level, thus were potentially eligible for benefits under the Affordable Care Act (52% for expanded Medicaid and 39% for exchange subsidies) (Kominski, 2017). A significant amount of literature indicates a positive association between health insurance coverage and overall reported health status with a significant increase after the implementation of the A.C.A., leading to the question: How does health insurance impact the current health status of a person?

In research conducted by the Panel Study of Income Dynamics (P.S.I.D.), the data suggests that two additional years of insurance coverage reduces the chance of reporting fair or poor health by ten percent while compounding over time (Barker, Li, 2020). The study focuses

on statistics from before 2009, while the data from this research occurs in the years 2009 and 2013. For this reason, the correlation between health insurance and health status should continue and become more widespread following the passing of the Affordable Healthcare Act on March 23rd, 2010.

Kominski (2017) found that uninsured adults too young for medicare eligibility maintained significantly worse health trends compared to insured people; however, after the implementation of Medicare coverage, previously uninsured people obtained a health status similar to the insured. Professor Gerald F. Kominski's findings suggest that the Affordable Care Act as a means of health coverage played a significant role in reducing health disparities experienced by the previously uninsured.

Some literature suggests a relationship between income and health levels. Notably, income indicates accessibility and affordability of healthcare. Income levels link to various types of healthcare coverage, including Medicare (a form of healthcare coverage for low-income individuals). Different types of insurance correlate with different levels of health. Hoffman and Paradise (2008) describe how the American healthcare system depends on income level. Their findings suggest that the quality of the type of coverage is positively associated with a higher income level. Through their research, Catherine Hoffman and Julia Paradise suggest that low-income individuals become less likely to own employer-sponsored insurance, while a higher-income household tends to own higher-quality insurance, primarily through private insurance companies. The research suggests that health insurance coverage correlates heavily with access to care. High-income individuals and households are more likely to have access to primary care visits, affordable prescription costs, and medical management of chronic illnesses or traumatic conditions. This access bears a significant positive impact on overall health

outcomes. Any form of health coverage positively impacts health status, but the type of health coverage a person receives varies with their income.

Economists, individuals in the health sector, and the government can utilize this correlation to bolster their understanding of the implications of healthcare availability and spending. These observations display the potential policy implementation and reform that can assist low-income households and create more affordable healthcare. By evaluating this data, economists can demonstrate that more health insurance leads to an overall healthier society. Despite previous policy efforts to improve the health coverage of uninsured individuals, such as the Affordable Healthcare Act, numerous people still face high costs of healthcare, leaving room for additional policy changes to create a healthier United States of America.

Health and wealth disparities among households and individuals exist across the United States. Health insurance coverage heavily determines an individual's access to healthcare. According to the United States Census Bureau, approximately 7.9 percent of Americans in March 2022 lived uninsured (Keisler-Starkey, Bunch, Linstrom, 2022). Numerous variables contribute to an individual's health in the United States; however, literature suggests that health insurance coverage carries a notable influence. Affordability of insurance, or lack thereof, leaves a considerable number of people without coverage, lowering their overall health and quality of life. The data from the Current Population Survey, for individuals 26 and older from the year 2009 and 2013, provides insight into the relationship between health coverage and health status, creating the question: does health insurance impact the current health status of a person in the United States? This analysis should prove that health insurance coverage leads to the increased health status of a person.

Just as hypothesized, if a respondent was insured, they were more likely to be very healthy. With that being said, there were other important factors that were found in the results, such as the family income or age of the respondent, which held a larger effect on the health status of the respondent.

Data

The data used comes from the Current Population Survey (C.P.S.), specifically focusing on the years 2009 and 2013. These years illustrate statistics before and after the implementation of the Affordable Healthcare Act, also known as the A.C.A. or ObamaCare, in 2010. The independent variable will be health coverage as a form of any insurance, public or private. This summary statistic includes any Children's Health Insurance Program (S.C.H.I.P.), employer-sponsored, individually purchased, Medicaid, Medicare, military, other public insurance, and covered by someone in the household. A new dummy variable for insurance was created where insurance = 1 if an individual has any form of insurance. Additionally, Uninsured=1 when an individual has no form of insurance according to the hcovany variable from C.P.S. The dependent variable is health status. Through the self-reported categorical variables from the C.P.S., five different levels of health will be used: excellent = 1, very good = 2, good = 3, fair = 4, poor = 5. The health status variable is a dummy variable where very healthy = 1, when health is excellent and very good, while very healthy = 0 when the reported levels are good, fair, and poor.

The confounding variables used as control variables in this research are: income, race, employment status, education, age, and number of children. Many of these were categorical variables which indicated the use of dummy variables. To measure the impact of different races,

a dummy variable for race was created (White, Black, Asian, Native American, and Other Race). For the education variable, multiple dummy variables were created to highlight differences in education levels (less than a high school diploma, high school diploma, some form of college, and a college degree or more). Another dummy variable created was to distinguish whether an individual was employed or unemployed. Other created dummy variables for income status by grouping income levels into categories were created (\$0 to \$29,999, \$30,000 to \$59,999, \$60,000 to \$99,999, and \$100,000+). Number of Children and Age are the only continuous variables included in the analysis. The data was restricted to only include individuals 26 and older.

Descriptive Statistics of 2009 and 2013 Current Population Survey:

Table 1: Summary Statistics

Variable	Average	Minimum	Maximum
White	0.793		
Black	0.115		
Asian	0.062		
Native American	0.013		
Other Race	0.017		
Less than a High School Diploma	0.127		
High School Diploma	0.299		
Some College Education	0.266		
College Degree or More	0.308		

Insured	0.850		
Uninsured	0.150		
Employed	0.639		
Unemployed	0.046		
Not in the Labor Force	0.315		
Family Income \$0 – \$29,999	0.258		
Family Income \$30,000 – \$59,999	0.290		
Family Income \$60,000 – \$99,999	0.241		
Family Income \$100,000 +	0.211		
Very Healthy	0.566		
Number of Children	0.986	0	9
Age	49.452	26	85
Number of Observations		252,490	

Table 1 shows the averages for each variable from 2009 and 2013. 85% of individuals included in the data set own any form of insurance, both public or private. 63.9% of individuals are employed. On average, 56.6% of respondents are in the very healthy category which includes self-reported health levels of excellent and very good. The average age of respondents was 49 years old. Most of the respondents included in the data set had either a high school and/or college diploma.

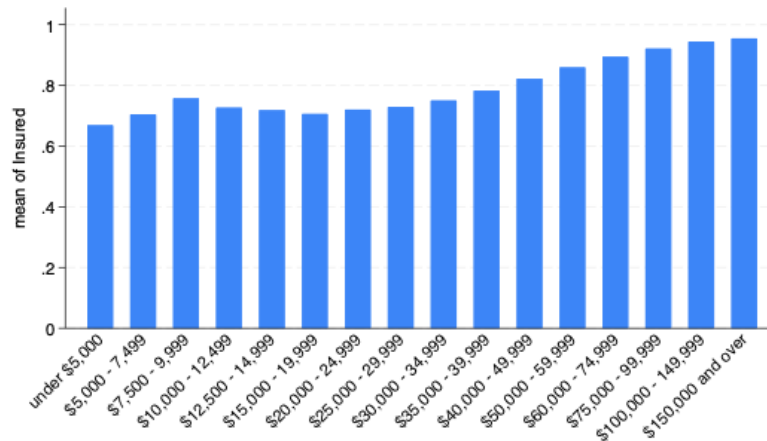
Figure 1: Mean of Insured Dummy Variable by Income

Figure 1 shows the average of the dummy variable for insurance coverage in each category of income for the data. Two variables with significance in these findings are: how both family income and insurance status affect a very healthy person. Thus, it became essential to determine the possible existence of any relationships between these two aforementioned variables. As can be seen in the graph, a definite correlation between the level of household income for a person and that person's healthcare coverage appears in this data. One possible correlation for this relationship comes from the income limits for Medicare aid, which for this time period would be approximately \$20,000. The income limit explained the existence of two peaks in insurance status as there is presumably a decrease in the number of people insured just above the income limit, which is reflected in the data.

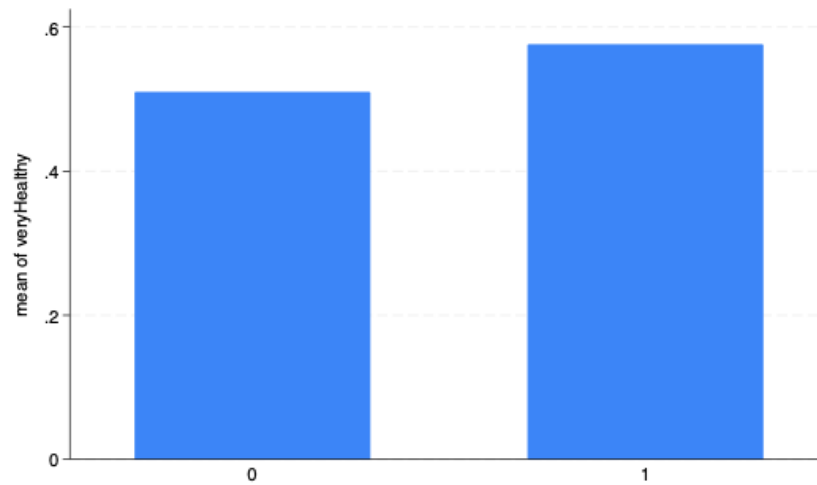
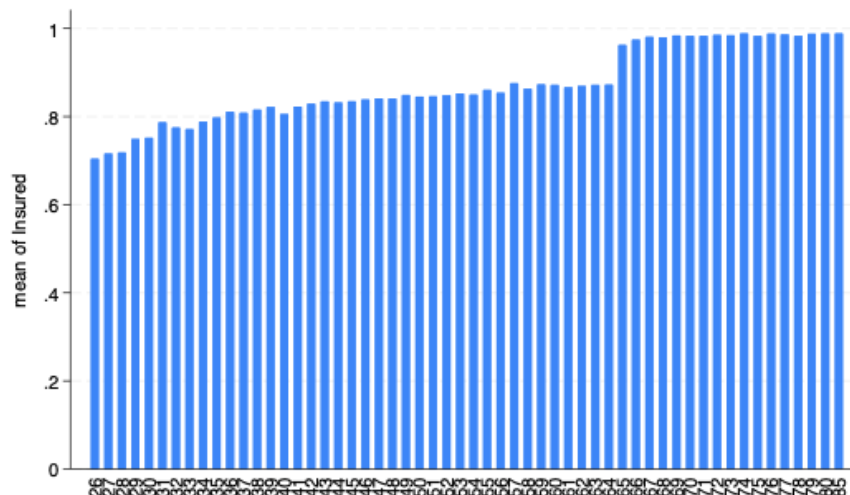
Figure 2: Mean of Very Healthy by Insurance Status

Figure 2 displays the average health score for all individuals grouped by insurance status. In this case, uninsured is 0 and insured is 1. There is a slight difference between the two categories of individuals where the insured group is, on average, slightly healthier. These results suggest that insured respondents are slightly more likely to respond as being in “Excellent” or “Very Good” health.

Figure 3: Mean of Insured Variable by Age

Although difficult to see the exact ages, an obvious correlation appears as age increases in respondents, so does insurance coverage, with a spike at 65 years old (the age limit for medicare). This correlation becomes noteworthy for the regressions as it could display a small or possible negative effect of insurance on health, as this figure shows those who are more likely to be insured are also more likely to be older, and thus in poor health.

Results

The binomial logit is a non-linear estimator used with the binary dependent variable of very healthy status. The Maximum Likelihood Estimation (M.L.E.) reduces the amount of error by testing different beta levels and calculating the predicted probabilities for each observation. The estimated coefficients have no particular meaning; however, the signs of the coefficients keep the same meaning as the Ordinary Least Square (O.L.S.) model. Instead, the marginal effect of the variables at the means of all the independent variables were calculated. The empirical regression equation to be estimated is:

$$\begin{aligned} \text{veryhealthy}_i = & \beta_0 + \beta_1 \text{insured}_i + \beta_2 \text{white}_i + \beta_3 \text{black}_i + \beta_4 \text{nativeamer}_i + \beta_5 \text{asian}_i + \\ & \beta_6 \text{employed}_i + \beta_7 \text{unemployed}_i + \beta_8 \text{highschool}_i + \beta_9 \text{someCollege}_i + \beta_{10} \text{collegePlus}_i + \\ & \beta_{11} \text{faminc30000_59999}_i + \beta_{12} \text{faminc60000_99999}_i + \beta_{13} \text{faminc100000plus} + \beta_{14} \text{age}_i + \\ & \beta_{15} \text{nchild}_i + \varepsilon_i \end{aligned}$$

The regression excludes: uninsured people, other race, not in the labor force, less than a high school degree, and families with income between \$0 to \$29,999 as the comparison categories for the dummy variables.

Preliminary Regression:

Table 2: LOGIT Regression for Health (for 26 year olds and older in the year 2009)

Variable	Marginal Effects	P-Value
Insured	0.045***	0.000
White	0.088***	0.000
Black	0.005	0.706
Native American	0.015	0.407
Asian	0.007	0.608
Employed	0.162***	0.000
Unemployed	0.091***	0.000
High School Diploma	0.091***	0.000
Some College Education	0.136***	0.000
College Degree or More	0.258***	0.000
Family Income \$30,000 to \$59,999	0.092***	0.000
Family Income \$60,000 to \$99,999	0.159***	0.000
Family Income \$100,000 +	0.242***	0.000
Age	-0.007***	0.000
Number of Children	0.01***	0.000
Number of Observations		104,924
Pseudo R ²		0.1415

Table 2 shows the binomial logit model regression on health status in 2009. The variable “insured” (a dummy variable for those who are insured) is highlighted in the table. Being insured increases the probability of having a better health status by 4.5 percentage points, when

compared to being uninsured, holding all other variables constant. This effect is statistically significant at the 95% confidence level, due to the p-value being less than 0.05. Family income is another significant factor in determining health status. All brackets of family income displayed in the table above increased the probability of a better health status and have a p-value $< .05$, indicating statistical significance at the 95% significance level. Specifically, the family income bracket of \$100,000 and above increases the probability of a better health status by 24.2 percentage points, compared to having a family income bracket of \$29,999 or less.

To analyze the effect of A.C.A., another binomial logit model regression was run on health status in 2013 to see the A.C.A.'s impact after its enactment in 2010. This regression is summarized in Table 3.

Table 3: LOGIT Regression for Health (for 26 year olds and older in the year 2013)

Variable	Marginal Effect	P-Value
Insured	0.023***	0.000
White	0.063***	0.000
Black	-0.001	0.964
Native American	-0.009	0.596
Asian	-0.012	0.347
Employed	0.168***	0.000
Unemployed	0.085***	0.000
High School Diploma	0.082***	0.000
Some College Education	0.131***	0.000
College Degree or more	0.241***	0.000
Family Income \$30,000 to \$59,999	0.081***	0.000
Family Income \$60,000 to \$99,999	0.135***	0.000
Family Income \$100,000 +	0.205***	0.000
Age	-0.006***	0.000
Number of Children	0.012***	0.000
Number of Observations		125,910
Pseudo R ²		0.1258

Table 3 shows the binomial logit model regression of health status in 2013. Being insured increases the probability of having a better health status by 2.3 percentage points, when

compared to being uninsured, holding all other variables constant. With a p-value less than 0.05, the effect is statistically significant at the 95% significance level. Family income is another significant factor in determining health status. All brackets of family income seen in the table above increased the probability of a better health status and have a p-value $< .05$, indicating statistical significance. Specifically, the family income bracket of \$100,000 and above increases the probability of a better health status by 20.5 percentage points, compared to having a family income bracket of \$29,999 or less.

In the 2009 data according to Table 2, each additional year of age decreases the probability of a better health status by 0.7 percentage points, which reflects the typical decline in health that is associated with aging. In the 2013 data according to Table 3, each additional year of age decreases the probability of a better health status by 0.6 percentage points which reflects the typical decline in health that is associated with aging.

Conclusion

In this paper, a positive relationship existed between if a person was considered very healthy, and the insurance status of that person in both 2009 and 2013. In both years, the calculated marginal effect of being insured proved to be statistically significant at the 95% confidence level and the second greatest factor in the health status of a person was found to be the family income of that person. With that said, the effect of insurance on being very healthy was found to decrease between 2009 and 2013. One possible explanation comes from the change in the demographics of those insured people. As of 2013, the medicare and medicaid bills gave insurance to more people in society who needed it most. Those people included the elderly, disabled, and people with pre-existing conditions. Given that on average people who fit into

those categories have a higher probability to be less healthy than most, it can be reasoned that the inclusion of these groups of people into the insured category might have decreased the overall mean of the very healthy variable. This inclusion would decrease the marginal effect of the insurance variable; however, it requires more to prove this theory true.

Due to Medicaid beginning at 65 years old, an additional regression was made with age limited from 26 to 64 years old. Observing the regression with age limited to 26 to 64 years old shows that being insured increases the probability of having better health status by 1.5 percentage points, compared to being uninsured, holding all other variables constant. Compared to the regression in which age is not limited to 26 to 64 years old, it highlights the effect of being insured on better health status for those under 65 years old is smaller than the effect of being insured on better health status for all ages, specifically those over age 65. This data indicates the importance of having health insurance for people over the age of 65, and represents the significance of Medicaid in improving health status. Although the analysis found that it became most significant for those 65 and older, this analysis still affirms that more widespread insurance will improve overall health status. Policies regarding healthcare coverage and insurance have the ability to increase health status across the entirety of the United States; however, in future research it is important to consider the different effects it can have on varying age groups.

According to Table 2 and Table 3, the p-value being greater than 0.05 resulted in the dummy variables for race (Black, Native American, Asian) being not statistically significant. A large portion of the sample being White becomes one possible explanation. The smaller sample sizes for Black, Native American, and Asian may explain why not enough variation exists to detect an effect. There may also be confounding variables, which indirectly capture the effect of race. Socioeconomic variables used in the regression, such as income and education, may affect

the relationship between race and health, possibly altering the effect of race on health and make it appear insignificant.

Given the information gathered from this data, the question on the effect of insurance on the health status of a person by saying with 95% confidence that insurance increases the health status of citizens can be answer; however, as to the further question on the effects of the Medicare and Medicaid bills, it cannot be determine whether or not these affected the increasing the health status of the United States, and more analysis would be required. This issue is one potential shortcoming of this investigation, and could be solved in the future by running more analysis on the data and controlling for more age groups, specifically if a person is over the age of 64, and thus has the ability to receive medicaid and what effect that might have on the marginal effect of insurance.

References

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