Observing the Impact of Individual Characteristics on access to Employer Sponsored Health Insurance

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Abstract

In this paper I observe a multitude of factors that impact individuals' likelihood to obtain employment that provides employer sponsored health insurance. By using data from the Current Population Survey, I find that there are distinct disparities present among varying races, education levels, gender, income, age, and health status in the probability of full-time employees aged 18-65 obtaining sponsored health plans from their employer. Some discrepancies such as gender and race appear to be conditional on external variables while others such as age, health status, income, education, and some races are stand alone significant in the issue.

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I. Introduction

Health insurance in the United States is a crucial factor in employment as it is privately supplied by only select employers by choice or mandates based on the size of the firm aside from public health plans. With this variety of health insurance and no health insurance among employment options, this leaves the labor market with an element of choice – whether to prioritize attaining jobs with health insurance or not. There are numerous factors in the backgrounds of participants in the labor force that will impact their choice in pursuing these jobs but also factors that will determine if the individual even has a choice to begin with. Many government policies have been implemented to account for retired individuals, those with health impairments, and those underage to account for variables outside of a person's control in deciding, but it is apparent that there remains plenty of individuals without health coverage.

The purpose of this paper is to attribute which conditions of a labor market participant incline them to obtain a job with employer sponsored health insurance – that is, an employer that either contributes partially to or funds fully a private health plan for the employee. Numerous factors can affect this result. For instance, one could expect that an individual subject to some form of discrimination would have less options to even choose a job that supplies health insurance. Furthermore, we would expect conditions of the worker to affect how they perceive their health as a priority, whether that spans from a health condition or merely age. Lastly, there is knowledge and opportunity which can greatly impact someone's decision which includes education perhaps granting more awareness over the importance of health insurance or higher income giving a person more choice and flexibility in what they want.

This study pulls from the Current Population Survey from 2006 to 2014 to account for all these variables that play into a decision to have health insurance. With this data, I explore the

different traits that impact the choice of health insurance as well as a discussion for why these variables have their corresponding effects. This will highlight which demographic components are inherently causing discrepancies in access to employer sponsored health insurance and which factors are more representative of a larger problem that certain groups face where this access is more representative of that issue.

II. Literature Review

The following literature provides context for how the labor market and access to private health insurance are connected through productivity, wages, and other characterizing attributes. It also provided insight into data sources to consider for my study and what elements to filter for in order to look specifically at workers weighing options in the private sector.

The paper, *Do Workers Accept Lower Wages in Exchange for Health Benefits?*, written by Craig A. Olson, gives insight into observing if the choice of employment by labor market participants falls inline with compensating wage theory. The theory states that individuals will accept a lower wage if there are other benefits involved, so Olson looks at full-time employed married women pulled from the Current Population Survey. It controls for husband's health coverage, firm size, and union status to find that the women accept a wage 20% lower for a job with health benefits compared to those that accept jobs without.

This work not only pointed me to a valuable data source but also highlighted income as a vital variable to consider when observing impacts on obtaining employer sponsored health insurance. The wage theory involved in this study showcases that there are tradeoffs involved in an individual's decision in pursuing employment, but I want to expand off this study to observe other external variables that are neglected here, one of which being education.

The piece, *Do those with more formal education have better health insurance opportunities?*, written by Diane M. Dewar explores the impact having a formal education has on having employer provided insurance, self provided insurance, or no insurance. She finds that those with higher wages, higher education, or even those employed in industries with more educated individuals have a higher probability of attaining employment with sponsored health insurance. The data used for this study is from the 1987 National Medical Expenditure Survey.

While this paper provides valuable insights to the effect several characteristics of individuals have on obtaining employer sponsored health insurance, it opens up further questions regarding varying levels of education instead of college and no college as there are many more than just two categories to consider when looking at education as a variable.

The paper, Effect of the Affordable Care Act on Racial and Ethnic Disparities in Health Insurance Coverage, written by Thomas C. Buchmueller, Zachary M. Levinson, Helen G. Levy, and Barbara L. Wolfe, shows that there is a clear racial disparity among the US population for who has health insurance. Using data from the American Community Survey, the authors show that 40.5% of Hispanics and 25.3% of Blacks are uninsured compared to a mere 14.8% of Whites being uninsured, though the Affordable Care Act did slightly reduce these disparities. The research observes those having health insurance through private coverage or medicaid – thus including a public health insurance plan.

The purpose of this piece for my study is that it introduces the problem of racial disparity in health insurance coverage, so it will be important to control for this when running probability regressions on factors that play into who chooses employment with health insurance coverage. It also sheds light on establishing existing trends and leaves me to explore the depth of these racial disparities in this more hyper-fixated study that looks exclusively at those dealing with private health insurance from employers.

III. Data

The data used for this project is from the Current Population Survey (CPS) through the years 2006 to 2014 to capture a significant portion of the data surrounding the Affordable Care Act (2010) administered under the Obama Administration.

The Current Population Survey is conducted annually on randomly sampled Americans to gather inputted data on demographics. This data includes employment information, health insurance status, and general backgrounds and descriptors – all of which are needed to classify the factors that play into choosing jobs with health insurance.

The basic demographic variables pulled from this dataset for the study include age, sex, gender, race, gross income, health status, and educational attainment. The variables pulled for the purpose of observing employment and health insurance include full-time/part-time status and if the employer contributes to the individual's private health insurance plan. There is also data on the health status of each participant, and this refers to a broad self categorization of the individuals to assess their health on a scale from one to five (one being of excellent health and five being of poor health). All of these attributes for each individual are listed twice as the survey is conducted in the given year as well as the following year to observe any changes; however, for the purpose of this study I will only be looking at the second year for each individual.

To observe only the participants in the survey that are expected to be in the labor force and of choosing jobs that provide private health insurance, I filtered out minors as they are expected to be under their parents health insurance or medicaid. For a similar reason, I also filtered out those above the age of 65 as they qualify for medicare thus making them irrelevant candidates for this study. Further, it was not necessary to look at people having public health insurance, so these were filtered out from the data set as well. Lastly, for the sake of simplicity, I

also filtered for those engaging in full-time work only. The entire data set for this time period consisted of 414,772 participants, but, after my process of filtering, I was left with 132,935 observations.

In order to compensate for sampling bias, the CPS adds corresponding annual social and economic supplement weights for each observation under the category ASECWT_2 (or ASECWT_1 when observing the first year). The weight is an individual-level sampling weight to account for any inverse probabilities of the following conditions: failure to interview; known distribution of the entire population according to age, sex, and race; and applying the same weight to husbands and wives.

Below are basic summary tables describing the demographics of the dataset. The mean values for each variable (excluding "Income" and "Age") can be interpreted as the percent of the dataset that holds that characteristic. For instance, the mean value corresponding with "Female" being 0.437 indicates that 43.7% of the observations are female. The total number of each characteristic is labeled under "N" along with the mean, standard deviation, minimum, maximum, and quartiles.

Table 1

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Female	58,107	0.437	0.496	0	0	1	1
Male	74,828	0.563	0.496	0	0	1	1
White	$112,\!439$	0.846	0.361	0	1	1	1
Black	10,974	0.083	0.275	0	0	0	1
Asian or Pacific Islander	6,481	0.049	0.215	0	0	0	1
American Indian	1,175	0.009	0.094	0	0	0	1
Other Race	1,866	0.014	0.118	0	0	0	1
Employer Contributed to Insurance	82,229	0.619	0.486	0	0	1	1
No GED or High School Diploma	8,543	0.064	0.245	0	0	0	1
High School	37,193	0.280	0.449	0	0	1	1
Associates	14,581	0.110	0.312	0	0	0	1
Bachelors	31,415	0.236	0.425	0	0	0	1
Graduate	17,371	0.131	0.337	0	0	0	1
Total Income	132,935	56,177	59,435	-15,798	27,000	66,005	1,700,287
Age	132,935	43.698	11.337	19	35	53	64
Health Status	132,935	2.054	0.897	1	1	3	5

IV. Methodology

In order to determine the variables at play for labor market participants in whether or not they achieve employment with privately covered health insurance, I run a multitude of linear regressions to establish a correlation and then further regressions to control for other characteristics. The initial regressions serve the purpose of showing that there is a relation between each variable observed and the presence of private health insurance provided by their employer.

To start, I begin my regressions with individually observing core traits of individuals pertaining to their race, gender, educational attainment, income, age, and health status. The following is the structure of the equation looking at the probability of the employer providing a private health insurance plan based on the demographic variable observed.

Employer Provided Insurance = $\beta_0 + \beta_1$ (Demographic Variable) + u_i

If the demographic variable in the regression is categorical (gender, race, etc...), I run the regression as an "as factor" making it observe each value in the category individually. This means that the presence of the variable present in the individual will have the corresponding probability (β_n) of having an employer provided health insurance from that factor. Otherwise, if the variable is numeric (age, income, etc...) I run a normal regression making the corresponding probability (β_1) be the probability of having an employer provided health insurance per increase in the unit of the variable.

To demonstrate how the categorical variables will work, I have laid out how race is regressed on "Employer Provided Insurance". In this case, the base level is chosen to be white since this is the identification of 84.1% of the dataset, so with that as the constant, any individual with a given variable will have the beta value of that added to the constant to provide the probability of them having employer provided health insurance.

Employer Provided Insurance = (White) β_0 +(Black) β_1 +(Asian or Pacific Islander) β_2 +
(American Indian) β_3 + (Other) β_4 + u_i

Following these initial regressions, I conduct a multivariable regression including all of the variables I am observing. This test provides robustness to account for any omitted variable bias that is frequent in single variable regressions. The following is the layout of the entire multivariable regression in a simplified format.

Employer Provided Insurance = $\beta_0 + (\text{Race})\beta_1 + (\text{Gender})\beta_2 +$ (Education) $\beta_3 + (\text{Age})\beta_4 + (\text{Income})\beta_5 + (\text{Health Status})\beta_6 + u_i$

V. Results

The results of this study preclude with the single regressions run on each variable. Below is the results for having one's employer provide health insurance regressed on race.

Table 2

	Dependent variable:
	Employer Provided Insurance
Black	-0.025^{***}
	(0.005)
Asian or Pacific Islander	-0.024***
	(0.007)
American Indian	-0.158***
	(0.017)
Other	-0.071***
	(0.014)
Constant	0.627***
	(0.001)
Observations	132,935
R ²	0.001
Adjusted R^2	0.001
Residual Std. Error	19.337 (df = 132930)
F Statistic	$36.043^{***} (df = 4; 132930)$
Note:	*p<0.1; **p<0.05; ***p<0.01

The constant in this case refers to being white making each race type's corresponding value point to the probability of someone getting a job with health insurance relative to the probability of someone who is white. This shows that being white indicates a 0.627 probability

(62.7% chance) of obtaining private health insurance through your employer. Further, it points that being black means that the likelihood of getting private health insurance through an employer is 0.025 less than being white or 0.602 total probability. Being Asian or Pacific Islander decreases the probability of having private health insurance by 0.024 making the total probability .603. Those of American Indian descent have the lowest probability of having employment that provides private health insurance standing at 0.469. The "Other" category refers to people of multiple races and has a coefficient of -0.071 which pertains to a total probability of .556. All of these results are statistically significant.

Table 3

	$Dependent\ variable:$
	Employer Provided Insurance
Female	-0.002
	(0.003)
Constant	0.624***
	(0.002)
Observations	132,935
\mathbb{R}^2	0.00000
Adjusted R^2	-0.00000
Residual Std. Error	19.348 (df = 132933)
F Statistic	0.587 (df = 1; 132933)
Note:	*p<0.1; **p<0.05; ***p<0.01

This table regressing gender on employer provided insurance indicates that there is a decreased likelihood of having an employer contribute to a private insurance plan for women than men. This discrepancy is less than the racial discrepancy shown previously as it indicates

women have .002 less probability than men to have insurance. Thus, the total probability of men having employer provided insurance is .624 (62.4%) and for women, .622 (62.2%) with statistically significant results.

Table 4

	Dependent variable:
	Employer Provided Insurance
High School	0.200***
Ü	(0.006)
Some College	0.221***
	(0.006)
Associates	0.279***
	(0.007)
Bachelors	0.324***
	(0.006)
Graduate	0.377***
	(0.006)
Constant	0.370***
	(0.005)
Observations	132,935
R^2	0.035
Adjusted R^2	0.034
Residual Std. Error	19.011 (df = 132929)
F Statistic	$950.696^{***} \text{ (df} = 5; 132929)$
Note:	*p<0.1; **p<0.05; ***p<0.01

This regression runs having employer provided insurance on educational attainment, so it observes the individual effect each level of education achieved has on a person's likelihood of

obtaining employment with health insurance included. The constant value, 0.370, refers to the probability of someone having employer provided health insurance without a high school diploma or GED. Each corresponding coefficient is then added to that constant to determine each educational level's probability thus indicating a person with a high school education, with a coefficient of 0.200, has a total probability of 0.570. Those with some college have a 0.221 greater probability than those without high school or a GED, thus granting a total probability of 0.591. An Associate's degree corresponds to a 0.279 higher probability or a total probability of 0.549. A Bachelor's degree is associated with a 0.324 increase in probability and has a total probability of 0.694. Anyone with a graduate degree (masters, doctorate, or professional degree) has the highest likelihood of having a job with health insurance standing at 0.747 (74.7%). All of these results are statistically significant. This regression shows that the higher level of education an individual attains, the higher the probability of obtaining a job with employer provided health insurance.

Table 5

	$Dependent\ variable:$
	Employer Provided Insurance
Age	0.005^{***}
	(0.0001)
Constant	0.419***
	(0.005)
Observations	132,935
\mathbb{R}^2	0.013
Adjusted R ²	0.013
Residual Std. Error	19.224 (df = 132933)
F Statistic	$1,715.257^{***} (df = 1; 132933)$
Note:	*p<0.1; **p<0.05; ***p<0.01

This table shows the regression of having employer provided insurance on age. The constant represents the probability of a 19 year old having health insurance through an employer due to the filtering in the dataset that dismissed any individuals under 19 in the second year of the study. Thus, the probability of a 19 year old having employer provided health insurance stands at 0.419 with statistically significant results, and each year older a person is increases their probability of obtaining health insurance by 0.005 – also with statistically significant results.

Table 6

	$Dependent\ variable:$
	Employer Provided Insurance
Log(Income)	0.185***
	(0.002)
Constant	-1.342^{***}
	(0.017)
Observations	132,700
R^2	0.097
Adjusted R^2	0.097
Residual Std. Error	18.379 (df = 132698)
F Statistic	$14,251.830^{***} (df = 1; 132698)$
Note:	*p<0.1; **p<0.05; ***p<0.01

Since this is a logarithmic regression, the corresponding coefficient to Log(Income) refers to the effect a one hundred percent increase in income has on the probability of having employer provided health insurance. Thus, a one percent increase in income indicates a 0.00185 (0.185%) increase in the probability of having a job that contributes to the individual's health insurance. Note that the number of observations dropped slightly, and this is because there were a few instances of income not being reported for individuals.

Table 7

	Dependent variable:
	Employer Provided Insurance
"Very good"	0.011***
v	(0.003)
"Good"	-0.034***
	(0.004)
"Fair"	-0.067^{***}
	(0.007)
"Poor"	-0.141^{***}
	(0.015)
Constant	0.631***
	(0.002)
Observations	132,935
R^2	0.003
Adjusted R^2	0.003
Residual Std. Error	19.322 (df = 132930)
F Statistic	$89.217^{***} (df = 4; 132930)$
Note:	*p<0.1; **p<0.05; ***p<0.01

In this regression, I run self-reported health status on whether or not individuals have employers that contribute to their health insurance. The constant in this regression refers to the probability of those with "Excellent" reported health having a 0.631 probability of having employer provided health insurance with statistically significant results. Those with "Very Good" health have the highest probability of having employer provided insurance with a coefficient of 0.011 meaning their total probability is 0.642, also statistically significant. After the "Very Good" coefficient, we see a downward sloping trend where the worse someone's self reported health is, the less likely they are to have employer provided health insurance. The "Good" variable stands at -0.034 making its total probability 0.597. The "Fair" reporting has a coefficient

of -0.067 making its total probability add up to 0.564, and the "Poor" status corresponds to -0.141 making a probability of 0.490. All of these coefficients have statistically significant results.

The last tables of this study entail a multivariable regression that includes all of the variables that I independently ran employer provided insurance on. As there were constants in the other regressions as these have been observing variables as factors, the constant in this multivariable regression are the same as those of the prior. Thus, the coefficients pertaining to race are relative to white, female is relative to male, health status is relative to "Excellent", and education is relative to no GED or High School education.

Table 8.1

Dependent variable:
Employer Provided Insurance
0.025***
(0.005)
-0.038***
(0.006)
-0.064***
(0.016)
-0.028**
(0.013)
0.030***
(0.003)
0.002***
(0.0001)
0.168***
(0.002)
0.023***
(0.003)
0.008**
(0.003)
-0.006
(0.006)
-0.043***
(0.015)

Table 8.2

	Dependent variable:
	Employer Provided Insurance
High School or GED	0.134***
	(0.006)
Some College	0.139***
	(0.006)
Associates	0.171***
	(0.007)
Bachelors	0.170***
	(0.006)
Graduate	0.161***
	(0.007)
Constant	-1.411^{***}
	(0.018)
Observations	132,700
R^2	0.108
Adjusted R ²	0.108
Residual Std. Error	18.270 (df = 132683)
F Statistic	$1,001.233^{***}$ (df = 16; 132683)
Note:	*p<0.1; **p<0.05; ***p<0.01

While largely similar to expectations of each categorical variable's impact on a person's attainment of private health insurance through their employer, there are notable differences. To start, here being black actually indicates a higher probability by 0.025 (or 2.5%) of getting employer provided health insurance than being white when controlling for the other categorical variables. Compared to what was found from the earlier regression, at -0.025 (or -2.5%), this is a 0.05 increase in probability from before with statistically significant results.

The other racial categories are similar to those we've observed already as they have the same sign of coefficients (negative), all with statistically significant results. Asian or Pacific Islander is now -0.038 where it was previously -0.024 meaning there is a greater impact being Asian or Pacific Islander has on the probability of obtaining employer provided health insurance when other demographics are included in the regression. American Indians have a probability of -0.064 where it was previously -0.158 meaning there is less of an impact of being American Indian has on the probability of obtaining health insurance in the multivariable regression. "Other Race" has a coefficient of -0.028 compared to the previous -0.071 meaning, like the Asian or Pacific Islanders, that being of "Other Race" has less of an impact on the probability of getting employer provided health insurance when other variables are accounted for.

Regarding gender, we also see a difference where being female actually has a positive relationship with someone obtaining employment that provides or contributes to private health insurance. Here we see 0.030 (or 3.0%) increased probability for females compared to males with statistically significant results which contrasts the previously found -0.002 coefficient.

Age is concluded to have a coefficient of 0.002 with statistical significance meaning for every year older a person is, their likelihood of having employer provided health insurance increases by 0.002 (or 0.2%). The logarithm of income is concluded to have a coefficient of 0.168 implying that a one hundred percent increase in a person's income leads to a 0.168 increase in the probability of that person having employer provided private health insurance (or a one percent increase in someone's income has a 0.00168 increase in the probability of them having employer provided health insurance).

There is some difference in how self-reported health status reflects a person's probability of having employment that provides or contributes to the individual's private health insurance

plan. Now we see that both "Very Good" and "Good" health statuses have a higher probability indicator of having employer provided insurance than "Excellent" (the highest one could rank their own health). The coefficient for "Very Good" is now 0.023 where it was 0.011 before. For "Good," it is now 0.008 where it was -0.034. "Fair" has a corresponding coefficient of -0.006 where it was previously -0.067, and "Poor" has a coefficient of -0.043 where it was -0.141. These coefficients are showing that these variables have less statistical significance when controlling for the other demographic variables as we even have a p-value of 0.06 associated with the "Fair" health status making it statistically insignificant.

The last factor included in this multivariable regression is the one pertaining to educational attainment. The coefficient for High School is 0.134 decreasing from the original 0.200. Some college education has a probability of 0.139 greater than no high school or GED which differs from our original probability of 0.221. An Associate's degree indicates a 0.171 increase in probability compared to the prior 0.279. A Bachelor's degree has a coefficient of 0.170 showing the initial drop that further education has on the probability of obtaining employer provided health insurance – the prior coefficient was 0.324. A Graduate degree has an even lower probability at 0.161 compared to its initial 0.377. All of these coefficients are statistically significant.

VI. Discussion

The contrasting values in coefficients from the independent regressions (that is, regressing employer provided insurance on an individual category) and the multivariable regression highlights whether the disparities in each groups access to health insurance is a matter of that variable itself or if that group is subject to other conditions that impact their probability of getting insurance.

The increase in probability of having employer provided insurance for black people implies that people whose race is black typically have other demographics – such as income or education – that impact their likelihood of having employer provided health insurance, but when looking at groups with similar backgrounds to given white people, they have a higher probability of receiving these types of jobs. Thus, this multivariable regression has highlighted an omitted variable bias present in the initial regression on race where it is the demographics at play that negatively impact black people.

The negative coefficients for other racial categories shows that even when holding constant main demographic variables constant, racial groups of Asian, Pacific Islander, American Indian, or "Other Race" have a negative relationship with employer provided health insurance. Though these coefficients were all smaller (excluding Asian or Pacific Islanders) than found in the initial regression, the negative relationship continues to indicate that being of these races by itself likely has an impact on the likelihood of obtaining employer provided health insurance. With regards to Asian and Pacific Islanders, their stronger negative relationship in the multivariable regression shows that it is possible that they are subject to more of an impact on their probability on the basis of their race.

The results of age and income both having similar but less strong of an impact on the likelihood of someone having employer provided health insurance is fitting as we would expect to see coefficients drop in strength as other variables are involved to account for any omitted variable bias. Nonetheless, they point to discrepancies in younger individuals and lower income individuals having a lower probability of obtaining employment where the employer contributes to private health insurance. One explanation for the age discrepancy can be that younger people are less likely to worry about their health, but it can also point to less job opportunities giving them fewer choices to even weigh health insurance as a factor. The income variable can be explained in that people of lower income could be more likely to value wages and are thus stuck choosing jobs with higher wages over jobs with health insurance.

This results on health status is expected as we would assume a variable that is self-reported, particularly on a complex subject such as health, to not be the most reflective of a person's actual health status. Although, it is hard to tell even intuitively how a person's health would impact their probability of seeking employment with health insurance. One could assume that people of lower health would pursue jobs with health insurance or it could be explained that it is more reflective meaning their health is poor due to not having health insurance.

VII. Conclusion

This study has highlighted important distinctions that could be key indicators in what is impacting the disparities present in individuals receiving health insurance from their employer. By excluding those already having public health insurance, this thus showcases the existing trends that are present in the private market to show problems that remain. Disparities to health insurance are not only a moral issue, but also an issue to the efficient placement of workers by preventing equal opportunity. This is to be avoided for concerns of inhibiting growth and to prevent tensions in our economic structures.

The findings that I provided help show what characteristics in individuals are representative of a problem outside that variable and which factors are in themself a problem contributing to the disparities. The gender disparity presents an issue where it is apparent that it is not likely that being female itself impacts the probability of having employer sponsored health insurance directly but rather affects other variables. Likewise, the results indicated a similar problem poised towards black individuals. Policymakers are likely to succeed in managing this problem through addressing environmental factors that negatively impact black people and women. Matters such as improving access to higher education, aiding employment to boost wages, or providing a public health plan that compensates for the overall disparities present – specifically directed towards lower income and lower educated individuals.

Other results on other races, educational attainment, income, age, and health status show that the systemic nature of employer provided health insurance is in favor of certain groups over others – where most of these groups, the characteristics defining them is not a matter of choice. The situation can be improved by providing public plans to compensate for these individuals or

providing incentives for either more businesses to sponsor health insurance or encouraging the businesses that do to provide work for these individuals.

This phenomenon is obviously complicated and the study itself could use more data to provide more valuable insights into what exactly is at play in the disparities among individuals receiving employer sponsored health plans. One area to consider that might affect the probability is types of jobs – that is, certain groups may be inclined to pursue work that generally offers health insurance more frequently. This study also fails to recognize whether these individuals have much choice in picking employment which would be valuable to know, so it is hard to say whether people are choosing jobs without health insurance intentionally or not.

Nonetheless, these results point to an issue that pertains to the wellbeing of individuals through their accessibility to healthcare. The disparities are present under this existing system, and it seems some form of intervention is necessary to solve the problem.

VIII. References

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