Preliminary Analysis - Research in Health Economics

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1 Introduction

The United States has one of the lowest life expectancy rates amongst OECD countries of 76.4 years as of 2021. According to the CDC, personal health care expenditure in 2019 was USD$2.937 billion. The cost of health care in USA is one of the highest in the world, leading to a large proportion of the population being unable to access adequate health care. Around 47% of the the adult population find it difficult to pay for medical costs, with adults in households with annual income below $40,000 being three times as likely as adults in households with annual income above $90,000 to find medical costs difficult to afford. These statistics show that health insurance could help ease the burden of medical costs and medical cost debt on people, allowing them to access necessary health care services to improve the quality of their health.

The Affordable Care Act (ACA) aimed to improve accessibility to healthcare by making affordable health insurance available to more people. As the groups with lower annual income levels are more prone to be unable to receive medical care, it is important to look at the impact of health insurance on the health of these groups to answer the question: "Can Health Insurance improve health?"

2 Data

This project is looking into the effect of health insurance on health outcomes to answer the question, "does health insurance improve health?" It is using annual survey data on general health trends in USA from the Behavioral Factor Surveillance System (BFRS). In particular, it is using the self-reported health status (GENHLTH) as an indicator of health with a rating of '1' corresponding to 'excellent health' and '5' to 'poor health' while a rating of '7' indicated people who were unsure of their health status. It is using data from 2011, 2012 and 2013 as years before Medicaid expansion and data on years 2014-2019 for years after expansion.

This is also using data for the state of Kentucky as the treatment variable as they have expanded Medicaid. The data has been lowered to only include people with annual income of $35,000 or less and people with no children to better study the impact of health insurance on low-income individuals.

For insurance data, it is using data from United States Census Bureau for the years 2012-2019 on the different types health-care coverage being used by the population. It is also using data from the Kaiser Family Foundation to determine the states which have expanded Medicaid and which have not to better compare the impact of Medicaid expansion on health. In particular, it is looking at the share of uninsured and insured, including distribution of insurance types, amongst the entire adult population to understand the effect of Medicaid expansion on health.

3 Data Analysis

Table 1 includes the summary statistics of the data on insurance distribution in the US. It shows that a majority of the population is covered under Employer-Provided Insurance with a mean of 2126012 and the second-most coverage is provided by Medicaid with a mean of 405643 over the years and across all states.

Table 1: Insurance Plan Summary Statistics

	Observations	Mean	Standard Deviation	Minimum	Maximum
Employer-Provided	416	2,126,012.09	2,334,520.92	194,796	13,216,474
Direct Purchase	416	305,473.19	385,152.23	15,534	2,427,618
Medicaid	416	405,643.29	595,766.46	9,975	4,529,147
Medicare	416	47,351.12	46,960.78	1,532	235,939
Uninsured	416	564,927.45	838,367.35	19,009	5,901,869

Looking at the difference in average share of insured and uninsured in the population according to States can give a better understanding of insurance distribution and its impact on health. Table 2 includes a summary of the share of insurance of insurance distribution for States which have not expanded Medicaid and Table 3 shows a summary for the States that have expanded Medicaid since 2014. The share of insured people amongst Medicaid expanded states is higher at 77.93% compared to 72.07% for states which not expanded Medicaid. This corresponds to better health ratings given by people in states with Medicaid expansion as shown in Table 4.

Table 2: Average Share of Insurance without Medicaid Expansion

State	Total Insured	Uninsured	Direct Purchase	Employer-Provided	Medicaid
Alabama	71.12	16.53	7.74	54.23	6.98
Florida	68.96	22.11	11.69	48.15	7.67
Georgia	69.18	20.94	7.75	54.29	5.75
Kansas	75.62	14.17	8.85	61.39	4.29
Mississippi	67.76	20.55	7.07	49.81	8.90
North Carolina	71.22	18.05	9.41	53.27	7.01
South Carolina	70.38	18.25	7.67	53.04	7.88
South Dakota	74.56	14.28	11.40	57.54	4.63
Tennessee	73.46	16.14	7.86	54.28	9.53
Texas	66.50	25.50	7.35	52.76	5.29
Wisconsin	82.71	9.16	7.68	64.93	9.21
Wyoming	73.34	16.92	9.00	59.32	4.16
Total Average	72.07	17.72	8.62	55.25	6.78

Table 3: Average Share of Insurance with Medicaid Expansion

State	Total Insured	Uninsured	Direct Purchase	Employer-Provided	Medicaid
Alaska	64.89	19.74	4.78	50.12	9.47
Arizona	73.84	17.20	7.70	51.27	13.64
Arkansas	72.59	16.00	7.95	50.56	11.69
California	78.10	14.98	9.05	52.84	15.32
Colorado	77.85	13.08	9.75	57.19	10.06
Connecticut	83.99	9.24	7.69	62.36	12.94
Delaware	80.75	9.63	6.04	60.77	12.47
District of Columbia	84.81	5.78	9.05	58.06	17.15
Hawaii	78.81	6.81	6.08	61.29	10.66
Idaho	71.61	18.12	11.80	53.66	5.15
Illinois	80.85	12.59	7.68	60.96	11.10
Indiana	77.85	14.03	6.73	61.21	8.45
Iowa	82.76	8.25	8.73	64.08	9.24
Kentucky	77.78	11.51	6.03	54.49	14.87
Louisiana	72.21	17.67	7.64	50.46	12.35
Maine	75.73	12.88	8.24	55.99	10.31
Maryland	80.17	10.20	7.12	62.20	9.86
Massachusetts	87.22	4.33	7.27	63.58	15.75
Michigan	80.50	10.56	7.23	59.19	12.89
Minnesota	85.23	7.41	8.16	65.21	11.01
Missouri	75.65	15.08	8.23	59.68	5.95
Montana	72.86	16.39	11.80	51.54	8.32
Nebraska	77.29	13.00	10.45	61.90	4.12
Nevada	71.83	19.17	6.80	54.63	9.16
New Hampshire	81.64	10.81	7.27	66.64	6.20
New Jersey	80.62	13.50	6.59	64.00	8.94
New Mexico	70.58	18.15	6.39	44.21	18.40
New York	81.61	10.56	6.74	57.26	16.65
North Dakota	79.77	10.11	11.37	62.64	5.09
Ohio	81.31	10.76	5.99	61.18	12.56
Oklahoma	68.30	21.63	7.74	52.64	5.97
Oregon	77.78	13.20	8.71	54.87	13.12
Pennsylvania	81.99	9.73	7.91	62.57	10.26
Rhode Island	81.46	9.27	8.00	59.51	12.83
Utah	78.42	14.38	9.79	63.81	4.16
Vermont	83.45	7.10	7.98	58.14	16.17
Virginia	73.36	13.69	8.11	59.13	4.75
Washington	77.72	12.21	7.86	58.49	10.39
West Virginia	76.14	12.63	4.27	53.24	16.19
Total Average	77.93	12.60	7.86	57.99	10.86

Table 4 below is showing the average health status rating for a state with Medicaid expansion and without. The average self-reported health status rating is 3.335 with Medicaid expansion and 3.371 without Medicaid expansion. As the mean rating is lower by 0.036 for states with Medicaid expansion, it can be understood that Medicaid expansion corresponds to better self-reported health status.

Table 4: Average Health Status Ratings

Medicaid Expansion	Observations	Average Health Status	Standard Deviation	Lower Interval	Upper Interval
Yes	7,406	3.335	1.177	3.308	3.362
No	6,484	3.371	1.179	3.308	3.362

The Figures 1 and 2 show the share of uninsured population and insured population respectively. As can be seen in Figure 1, the share of uninsured population has fallen significantly from around 18.7% in 2012 to 11.1% in 2016, before increasing slightly to around 11.9% in 2019. Figure 2 shows share of insured population, on the other hand, has continued to increase from around 71.4% of the population in 2012 to around 78% in 2019, remaining fairly constant since 2016.

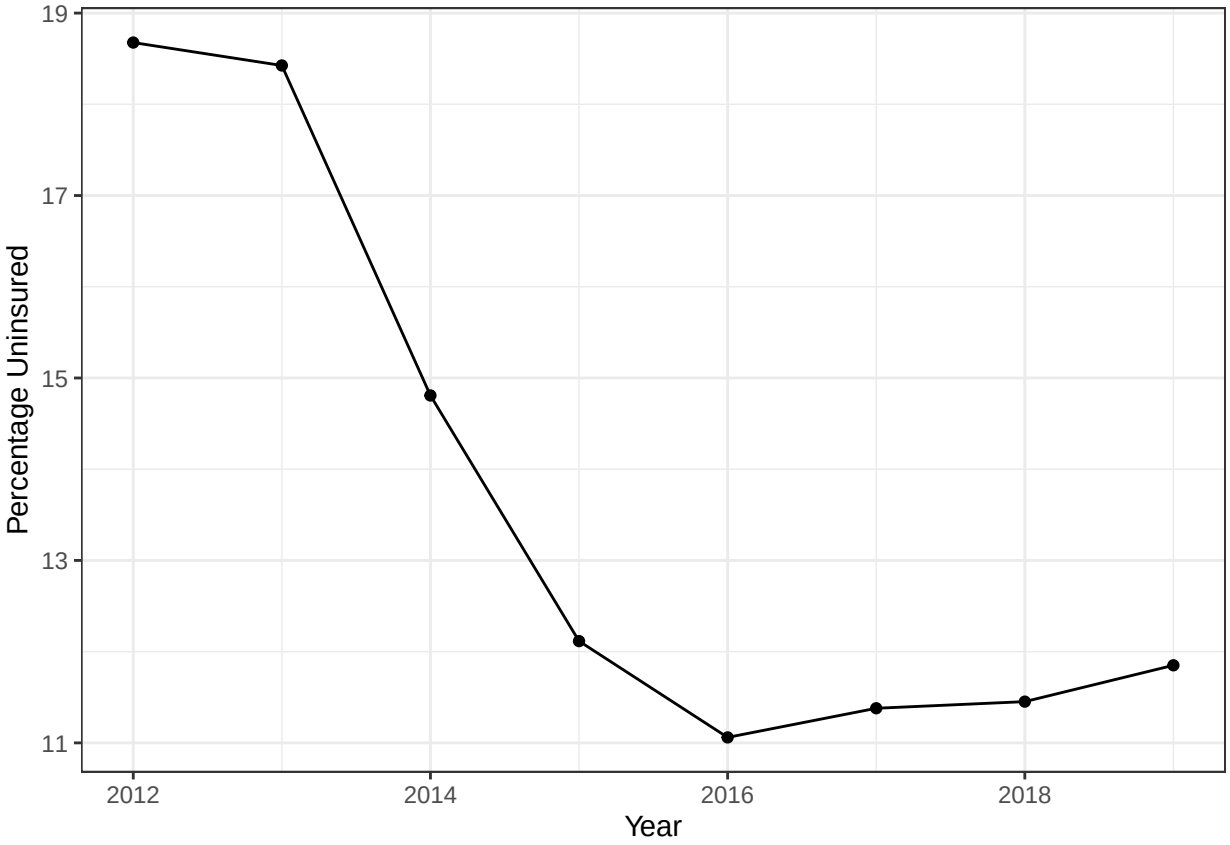

Figure 1: Share of Uninsured Population

Figure 2 also shows the distribution of insurance coverage used by people. Employer-Provided Insurance makes up the largest share of insured population while Direct Purchase make up the smallest share from 2012 to 2019. However, the share of Medicaid has increased since 2014 while the share of Employer-Provided Insurance has started to reduce since 2013, before increase slightly till 2019.

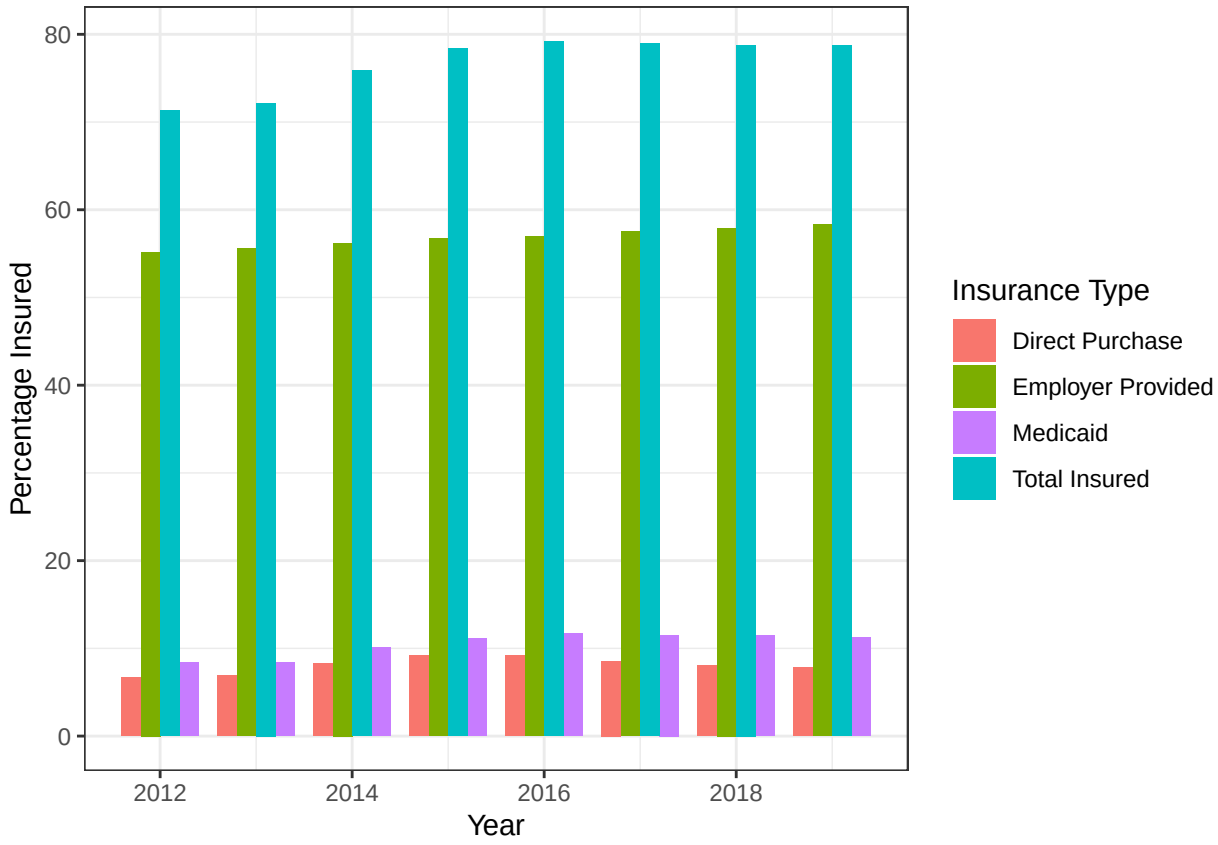

Figure 2: Share of Insurance Distribution

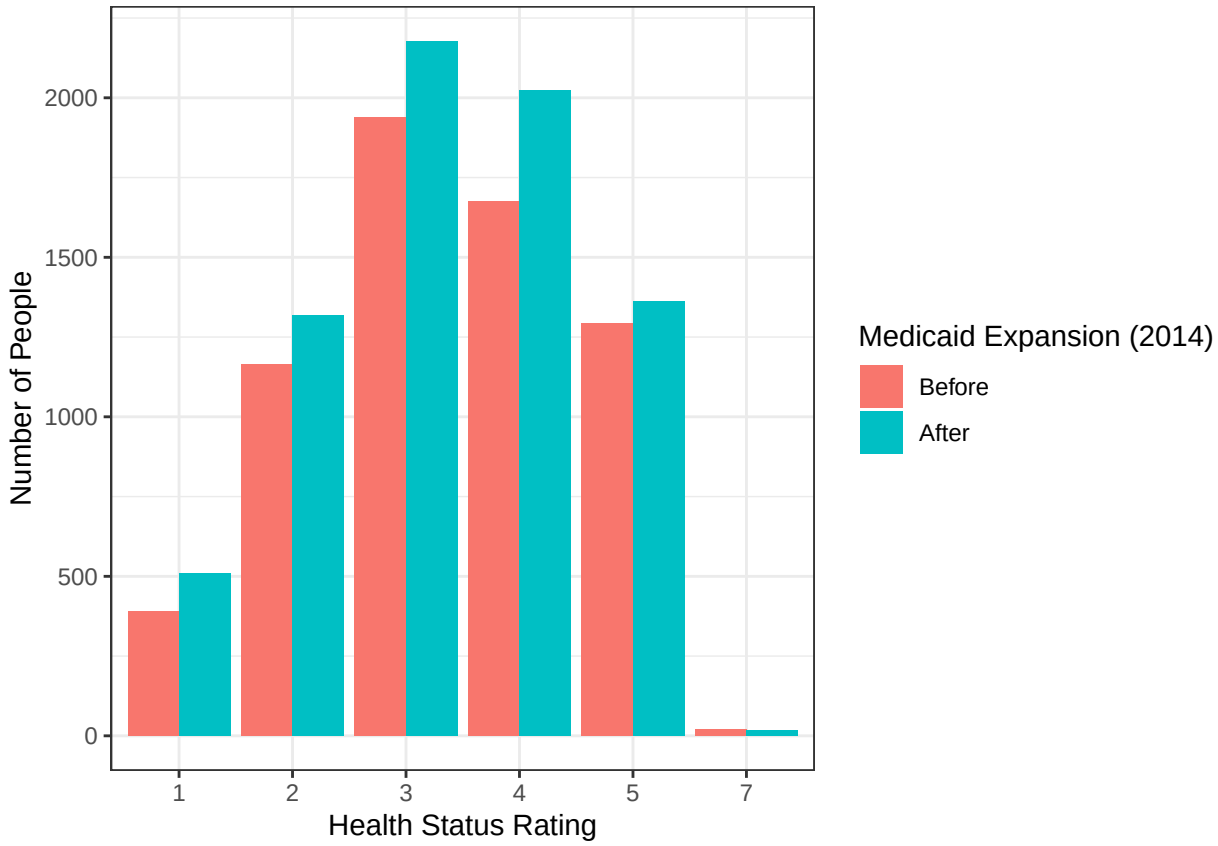

Figure 3: Self Reported Health Status with(out) Medicaid Expansion

As shown in Figure 3, more people (amongst lower income groups) reported a better rating for their health status after Medicaid expansion, compared to before. Approximately 100 more people rated their health status '1' which corresponds to 'excellent health' after 2014 while 150 more rated '2' corresponding to 'very good health' while around 200 more rated their health as '3', corresponding to 'good health' and around 400 more people rated their health as '4' or 'fair'. The figure also shows that around 50 more people have rated their health status as 'poor' after the Medicaid expansion. This could be due to the larger number of observations used for after Medicaid expansion compared to before. However, this increase is small compared to the increase in positive ratings.

Figure 4 shows self-reported health status of the population based on whether they have any kind of health coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare, or Indian Health Service. The graph shows that people with some form of health coverage tend to report a better health status compared to those without health coverage, indicating that health insurance could improve the quality of health. While the graph also shows more people with health coverage reporting their health as '5' meaning 'poor', it could be due to more people with pre-existing health conditions or poor health enrolling in health coverage plans compared to healthy people.

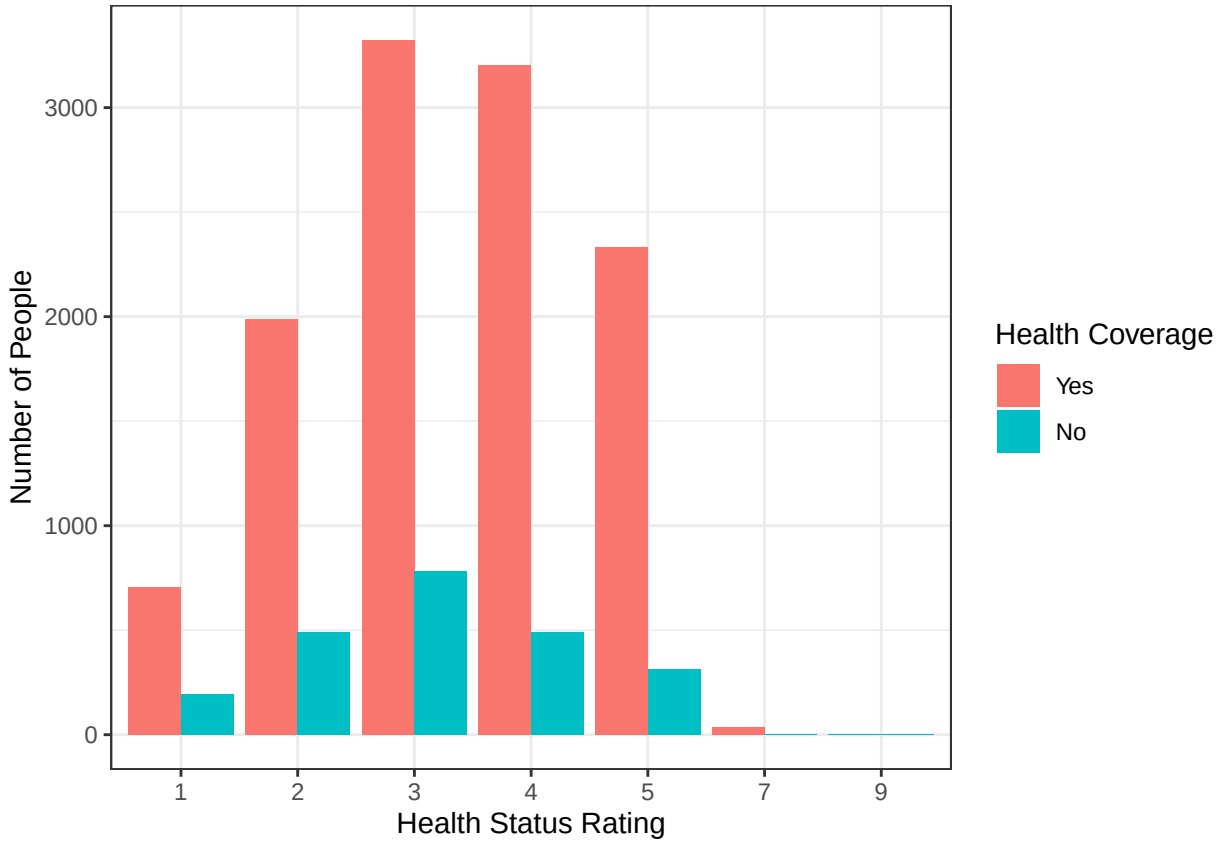

Figure 4: Self Reported Health Status and Health Care Coverage

4 Conclusion

The results from the above analysis show how health insurance, particularly Medicaid expansion, affects the health status of lower income individuals. People with health coverage, on average, report marginally better health status than those that do not have any health coverage and Medicaid expansion of 2014 led to a higher share of the adult population being insured at 77.93% compared to 72.07%. While the difference in average health status may not appear significant, looking at the way Medicaid expansion improved health coverage for low income adults,it can be concluded that Medicaid expansion (and health insurance) is beneficial to people in improving their accessability to health insurance and thus, improve their health.