

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.

3 Data Analysis

Table 1 above 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 2.1260121×10^6 and the second-most coverage is provided by Medicaid with a mean of 4.0564329×10^5 over the years and across all states.

Table 1: Insurance Plan Summary Statistics

	Observations	Mean	Standard Deviation	Minimum	Maximum
ins_employer	416	2,126,012.09	2,334,520.92	194,796	13,216,474
ins_direct	416	305,473.19	385,152.23	15,534	2,427,618
ins_medicaid	416	405,643.29	595,766.46	9,975	4,529,147
ins_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	Average Insured	Average Uninsured	Average Direct Purchase	Average Employer-Provided	Average Medicaid
Alabama	71.12101	16.53166	7.738230	54.22821	6.981585
Florida	68.96030	22.10937	11.686345	48.14971	7.669438
Georgia	69.18161	20.94417	7.754269	54.29462	5.748276
Kansas	75.61638	14.16747	8.849088	61.39306	4.294939
Mississippi	67.75585	20.55271	7.066397	49.81477	8.899107
North Carolina	71.22498	18.04868	9.411642	53.27060	7.012084
South Carolina	70.37783	18.25224	7.674686	53.03769	7.877608
South Dakota	74.56165	14.28065	11.397515	57.54004	4.634599
Tennessee	73.46484	16.13851	7.859631	54.28261	9.534740
Texas	66.50214	25.50396	7.347885	52.75525	5.285959
Wisconsin	82.71222	9.15619	7.681737	64.93110	9.208511
Wyoming	73.34406	16.92109	9.002484	59.32482	4.157301
Total Average	72.06857	17.71722	8.622492	55.25187	6.775346

Table 3: Average Share of Insurance with Medicaid Expansion

State	Average Insured	Average Uninsured	Average Direct Purchase	Average Employer-Provided	Average Medicaid
Alaska	64.88908	19.737403	4.775648	50.12047	9.466234
Arizona	73.84153	17.195369	7.704385	51.26888	13.644637
Arkansas	72.58593	15.996237	7.954078	50.56475	11.691576
California	78.10040	14.975812	9.054111	52.84115	15.322260
Colorado	77.85327	13.080262	9.749116	57.18894	10.058228
Connecticut	83.99151	9.235459	7.694052	62.35951	12.936123
Delaware	80.74897	9.631871	6.035651	60.77054	12.469894
District of Columbia	84.80560	5.782024	9.048104	58.05706	17.153719
Hawaii	78.80972	6.806435	6.077722	61.29009	10.657117
Idaho	71.61048	18.120769	11.802801	53.66273	5.149296
Illinois	80.84749	12.588118	7.681944	60.95579	11.099087
Indiana	77.85380	14.034386	6.729894	61.21403	8.452072
Iowa	82.75794	8.246481	8.729167	64.07737	9.241587
Kentucky	77.78188	11.506548	6.025452	54.48958	14.871175
Louisiana	72.20953	17.673565	7.642545	50.45827	12.352466
Maine	75.73247	12.877699	8.238675	55.99262	10.308668
Maryland	80.17140	10.203761	7.116594	62.19839	9.859818
Massachusetts	87.22155	4.325749	7.272834	63.58017	15.748405
Michigan	80.49999	10.556783	7.233312	59.18713	12.885044
Minnesota	85.22976	7.410168	8.161264	65.21280	11.012781
Missouri	75.65402	15.084333	8.226007	59.68331	5.952293
Montana	72.86429	16.392922	11.804767	51.54425	8.317514
Nebraska	77.28603	12.999598	10.448638	61.90141	4.118836
Nevada	71.83013	19.174256	6.802082	54.62506	9.157082
New Hampshire	81.64325	10.805673	7.267937	66.63637	6.199679
New Jersey	80.61552	13.498627	6.594614	63.99650	8.944971
New Mexico	70.57850	18.151253	6.388698	44.20515	18.402473
New York	81.60798	10.557116	6.741752	57.25740	16.650129
North Dakota	79.77499	10.108728	11.367482	62.63921	5.087502
Ohio	81.30759	10.759509	5.986907	61.17694	12.555837
Oklahoma	68.29876	21.625969	7.742541	52.64175	5.966145
Oregon	77.77973	13.198703	8.708054	54.86764	13.118308
Pennsylvania	81.98652	9.733213	7.912324	62.56552	10.261651
Rhode Island	81.46153	9.269425	7.995564	59.51162	12.831743
Utah	78.41707	14.380731	9.788558	63.81047	4.158326
Vermont	83.45266	7.102627	7.976961	58.13698	16.174409
Virginia	73.36243	13.694997	8.113356	59.12899	4.752917
Washington	77.72001	12.208760	7.864718	58.48573	10.393402
West Virginia	76.13574	12.629879	4.272756	53.23695	16.188517
Total Average	77.93126	12.599006	7.864899	57.98824	10.861844

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	3.335269	1.177124	3.308457	3.36208
No	6,484	3.371067	1.179496	3.308457	3.36208

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 18.6% in 2012 to 11% in 2016, before increasing slightly to almost 12% in 2019. Figure 2 shows share of insured population, on the other hand, has continued to increase from around 71% of the population in 2012 to around 78% in 2019, remaining fairly constant since 2016.

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.

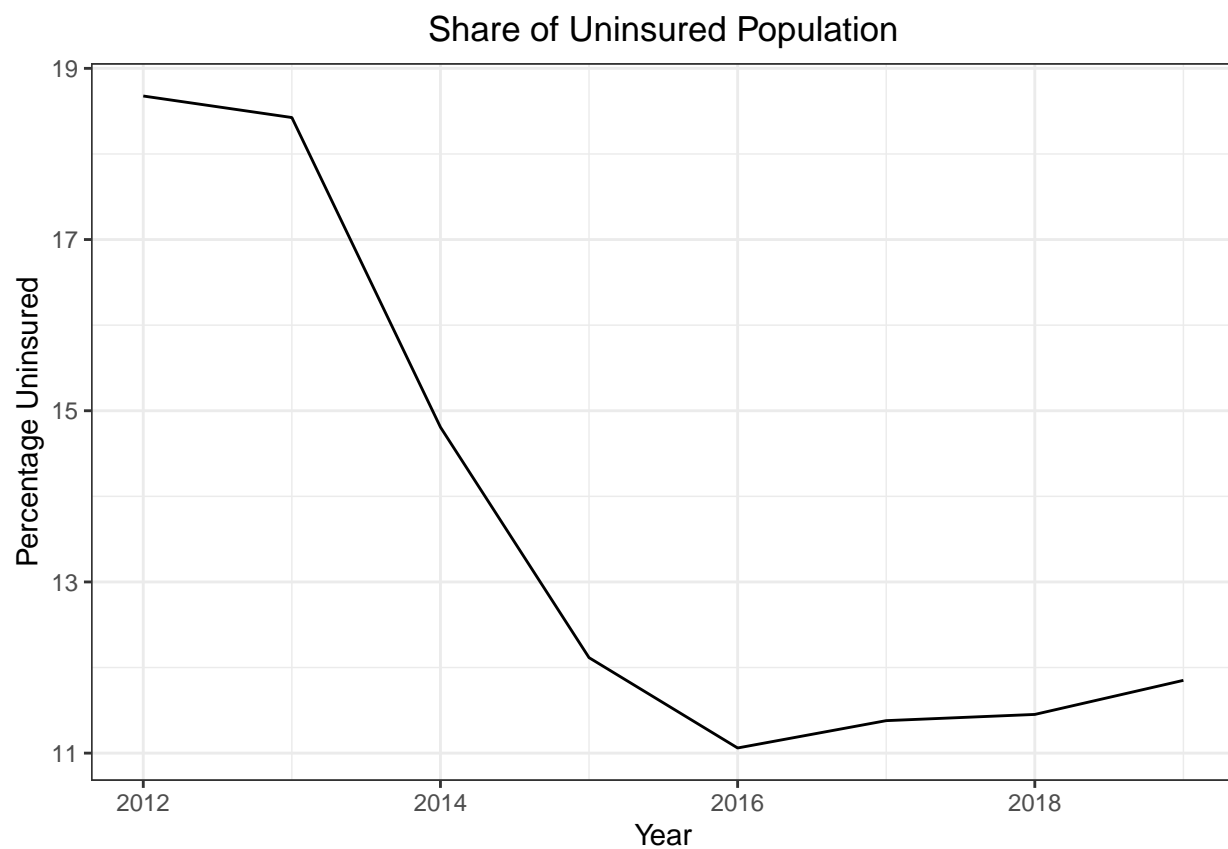


Figure 1: Share of Uninsured Population

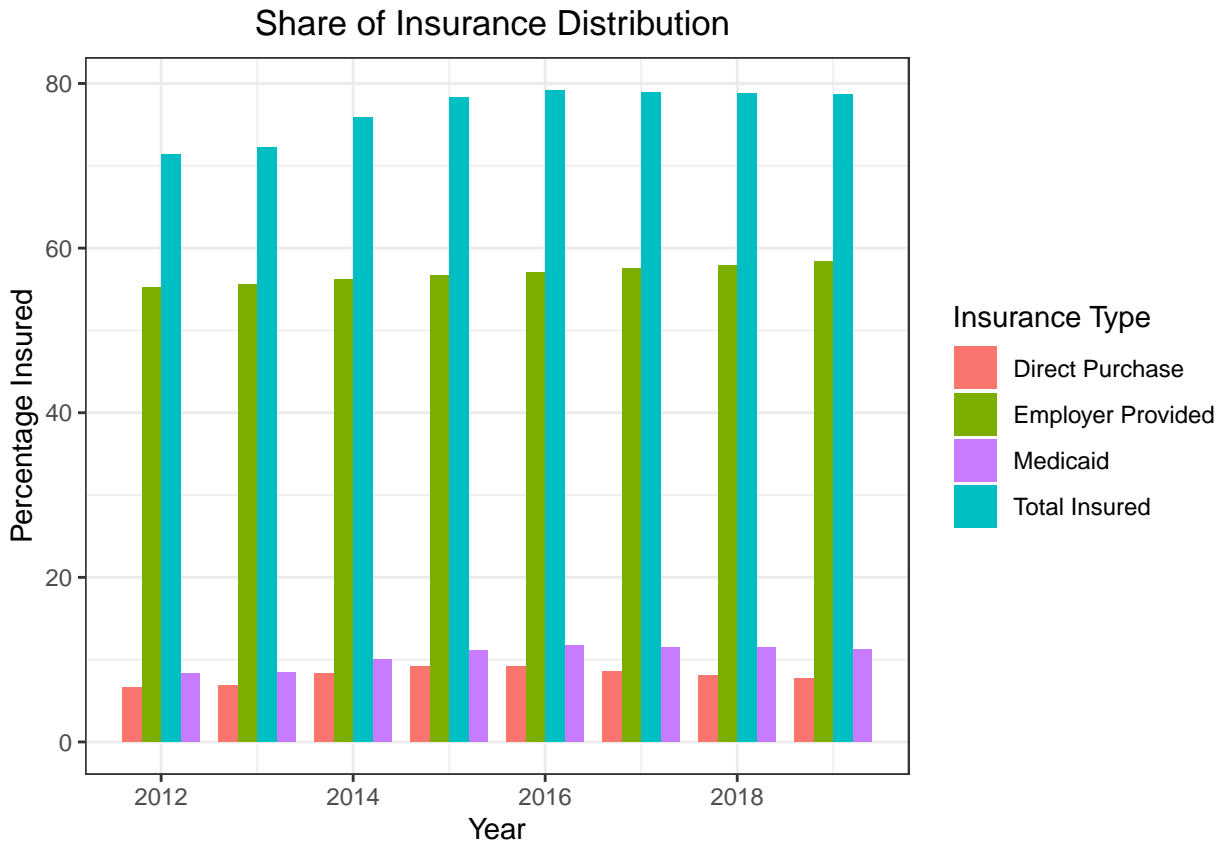


Figure 2: Share of Insurance Distribution

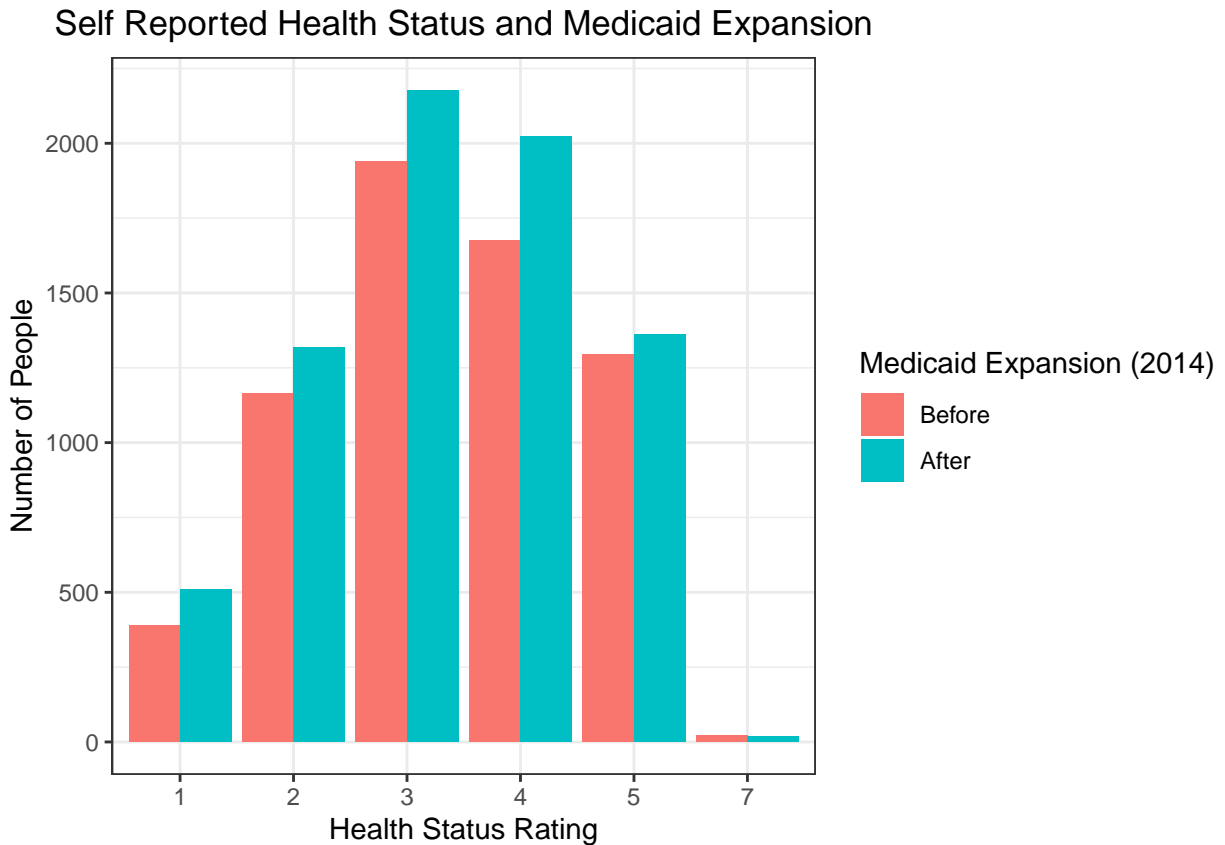


Figure 3: Self Reported Health Status with(out) Medicaid Expansion

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.

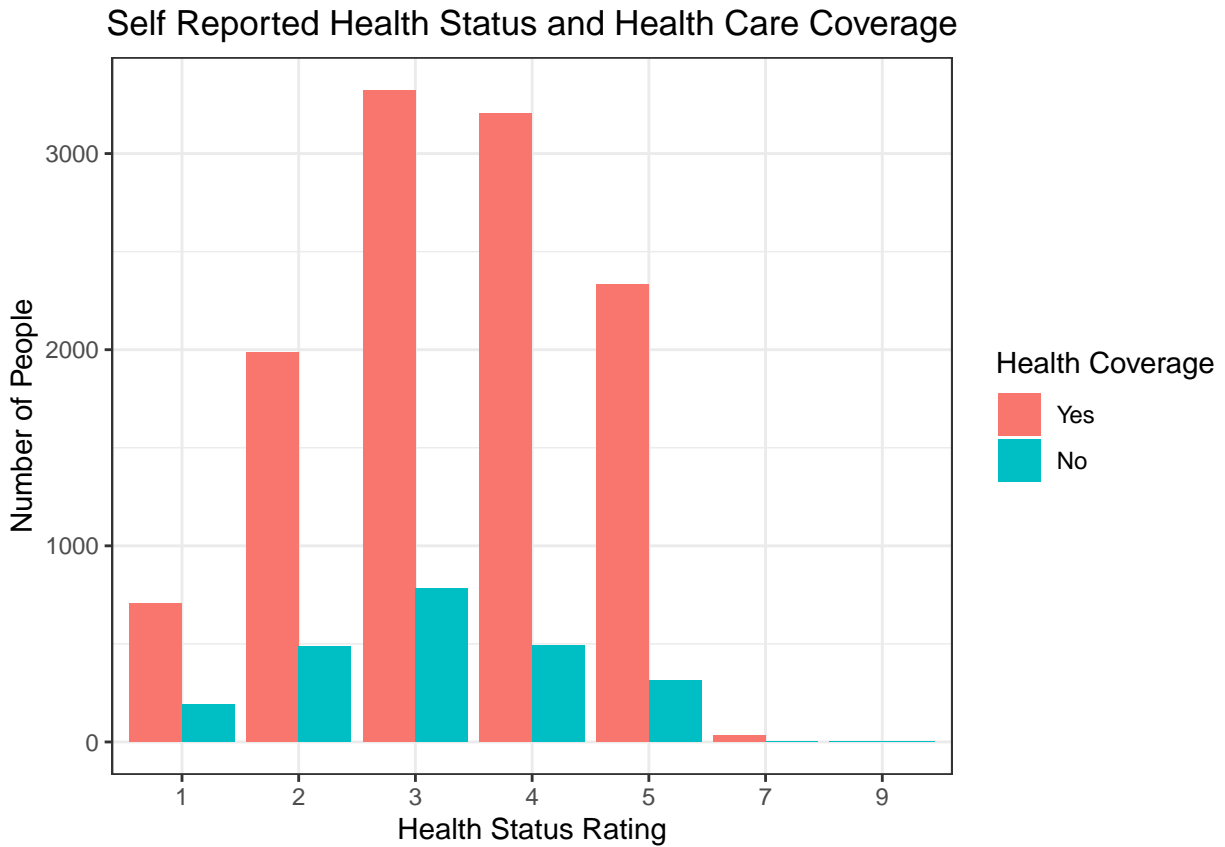


Figure 4: Self Reported Health Status and Health Care Coverage

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.