

Problem Statement: Does household income affect examination scores?

	state	act_2017_part	act_2018_part
0	alabama	1.00	1.00
3	arkansas	1.00	1.00
17	kentucky	1.00	1.00
18	louisiana	1.00	1.00
24	mississippi	1.00	1.00
25	missouri	1.00	1.00
26	montana	1.00	1.00
28	nevada	1.00	1.00
33	north_carolina	1.00	1.00
36	oklahoma	1.00	1.00
40	south_carolina	1.00	1.00
42	tennessee	1.00	1.00
44	utah	1.00	1.00
49	wisconsin	1.00	1.00
50	wyoming	1.00	1.00
23	minnesota	1.00	0.99
5	colorado	1.00	0.30
34	north_dakota	0.98	0.98
13	illinois	0.93	0.43
11	hawaii	0.90	0.89

	state	sat_2017_part
22	michigan	1.00
6	connecticut	1.00
7	delaware	1.00
8	district_of_columbia	1.00
29	new_hampshire	0.96
19	maine	0.95
12	idaho	0.93
9	florida	0.83

	state	sat_2018_part
12	idaho	1.00
7	delaware	1.00
22	michigan	1.00
5	colorado	1.00
6	connecticut	1.00
19	maine	0.99
13	illinois	0.99
39	rhode_island	0.97

First, we view state trends of participation and exam scores through the years.

Observation: States which have high rates of participation in one year also have high rates of participation in the next year.

Top 7 States with Lowest Exam Participation

Top 7 States with Lowest ACT Participation, Ranked

Year	State	Exam	Participation Rate	Year	State	Exam	Participation Rate
2017	Maine	ACT	0.08	2018	Maine	ACT	0.07
2017	New Hampshire	ACT	0.18	2018	Rhode Island	ACT	0.15
2017	Delaware	ACT	0.18	2018	New Hampshire	ACT	0.16
2017	Rhode Island	ACT	0.21	2018	Delaware	ACT	0.17
2017	Pennsylvania	ACT	0.23	2018	Pennsylvania	ACT	0.20
2017	Maryland	ACT	0.28	2018	Michigan	ACT	0.22
2017	Vermont	ACT	0.29	2018	Washington	ACT	0.24

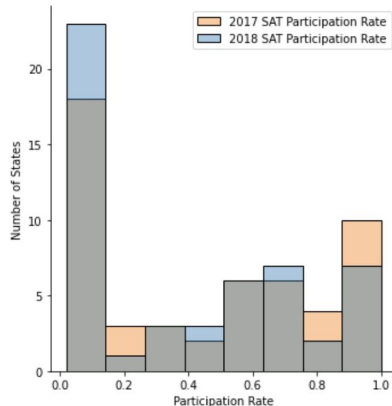
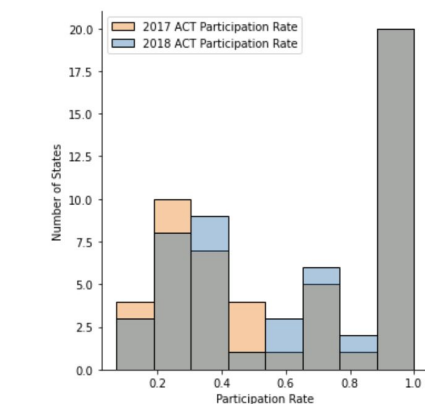
Comparing low participation rates by states.

Observation: The same trend is true for low end participation. States which have low rates of participation repeat their status as low participants of such exams.

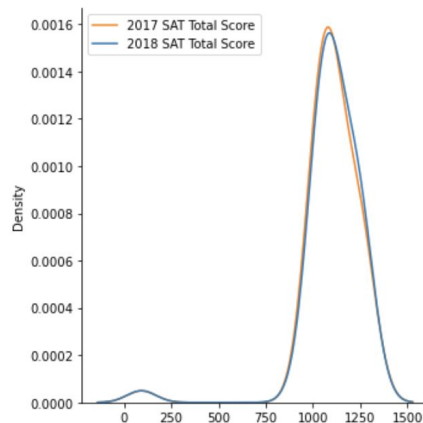
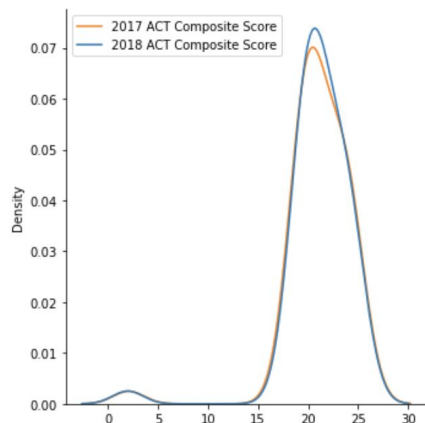
Top 7 States with Lowest SAT Participation, Ranked

Year	State	Exam	Participation Rate	Year	State	Exam	Participation Rate
2017	North Dakota	SAT	0.02	2018	North Dakota	SAT	0.02
2017	Mississippi	SAT	0.02	2018	Wyoming	SAT	0.03
2017	Iowa	SAT	0.02	2018	South Dakota	SAT	0.03
2017	Missouri	SAT	0.03	2018	Nebraska	SAT	0.03
2017	Utah	SAT	0.03	2018	Wisconsin	SAT	0.03
2017	South Dakota	SAT	0.03	2018	Mississippi	SAT	0.03
2017	Nebraska	SAT	0.03	2018	Iowa	SAT	0.03

Trend of Exam Participation and Scores Through the Years

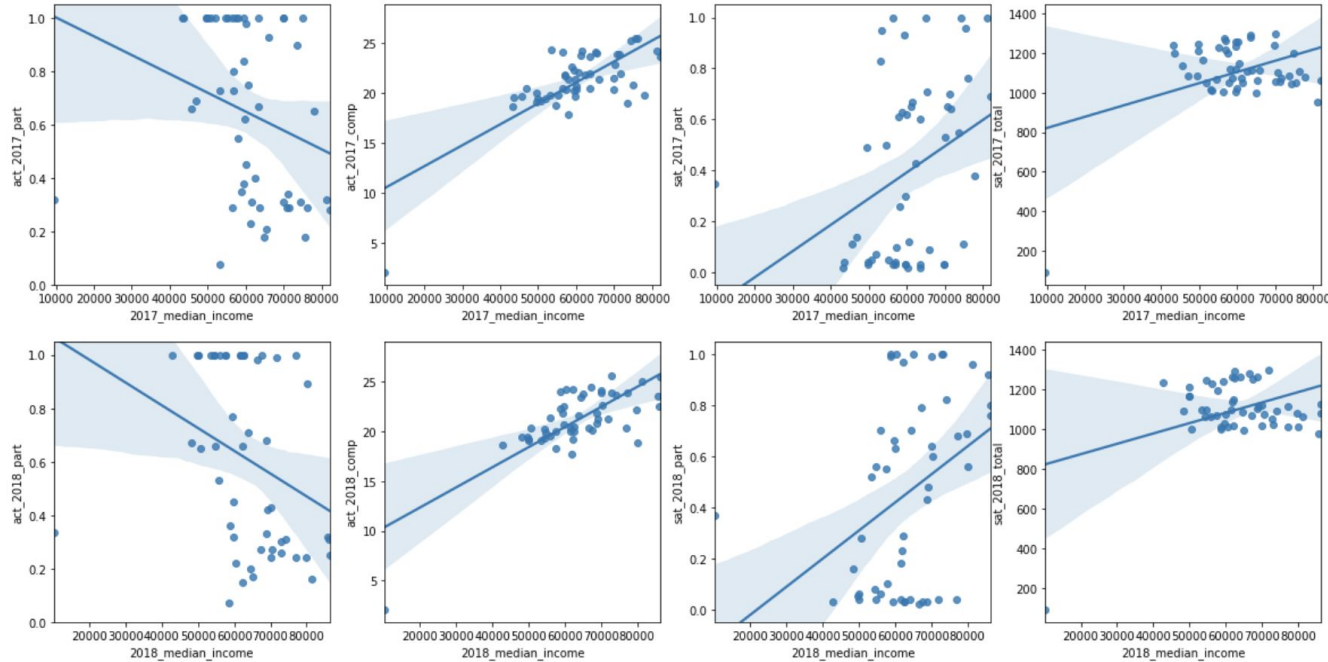


Comparing annual trends across exams, there is an increase in SAT participation and a decrease in ACT participation by states.



However, the spread of exam results have remained fairly consistent despite the changes in participation.

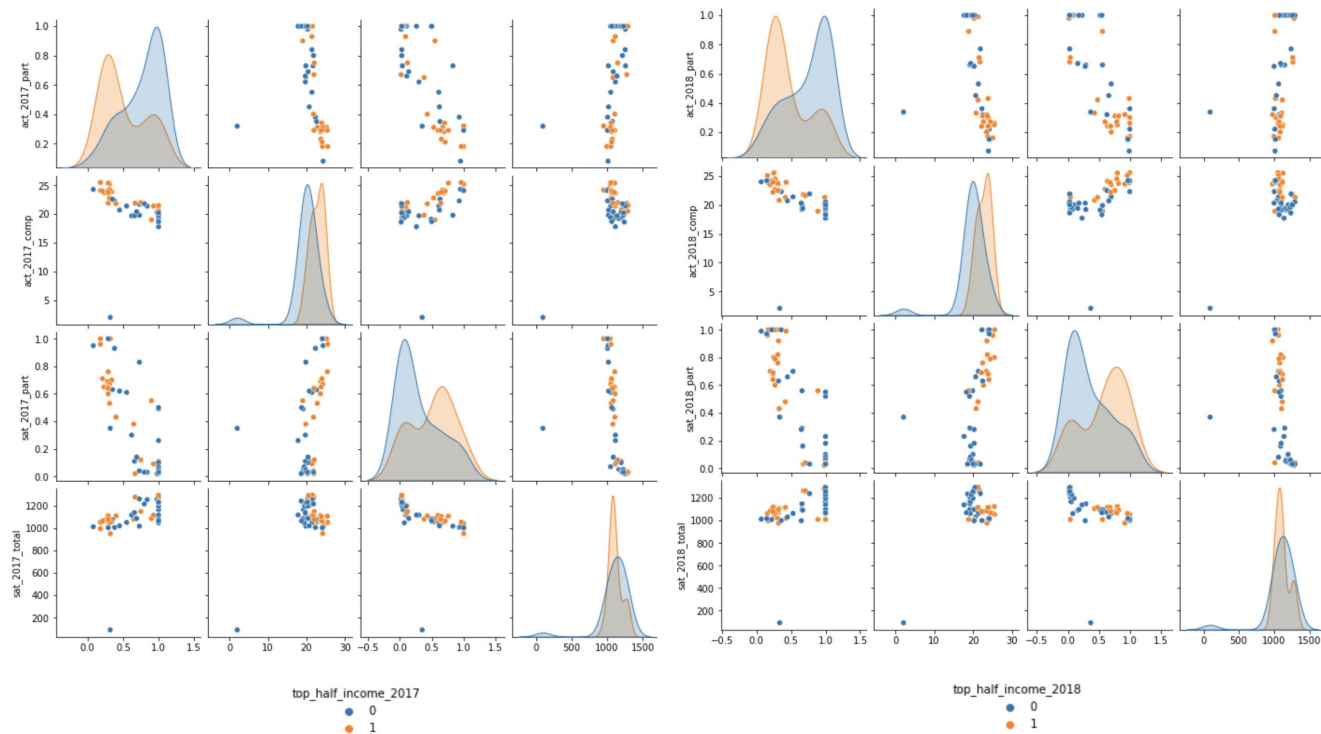
Is Income a Factor? Regressing Median Household Income to Exam Participation Rate and Scores



Mixed results: Higher median income contributes to higher ACT and SAT scores, but lower ACT participation and higher SAT scores.

Other factors should be considered when taking into account whether disproportionate federal funding should be allocated to supplement household spending on education to increase participation.

Trend of Participation and Scores based on Top and Bottom Half Household Income



When grouped by whether a state's median household income is in the top or bottom half nationally, there is a stronger trend that households which have higher median incomes do better on both exams.

Similar to the previous observation, as household income increases, participation rate drops for ACT while it increases for SAT.