An Analysis of 2022 ACS Data from IPUMS

Group36

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Introduction

Using the data from 2022 ACS, showing the respondents in each state of STATEICP that had a doctoral degree as their highest educational attainment of EDUC.

Instructions on how to obtain the data

The data from the website of IMPUS of USA, and the I creates the account that can help me to download the data. After log in, selecting data and click on "SELECT DATA" in the top navigation bar to access the data selection page. In the Sample Selection section, select data for the 2022 ACS. Next, click on "SELECT VARIABLES" on the left side of the page. In the search bar, look for "STATEICP" (for state) and add it to the data cart, then look for "EDUCD" (for educational attainment). After selecting your variables, click View Cart at the top right of the page and then click Create Data Extract. Next, name the extract and submit the request, which will be processed in the background. Check the status in My Data Extracts when the extraction is complete. Finally, download the .csv file.

overview of the ratio estimators approach

The ratio estimators approach uses the proportion of respondents with doctoral degrees in California to estimate the total number of respondents in each state across the U.S. Specifically, we calculate the ratio of doctoral degree holders to the total respondents in California and assume this ratio is similar across other states. By applying this ratio to the total population of each state, we can estimate the number of doctoral degree holders of each state. This approach leverages California's data as a baseline to make inferences about the broader distribution of education levels across the country.

Based on the dataset, we find that the total number of respondents in California is 391,171, with 6,336 of them holding doctoral degrees. This results the doctoral degree holders ratio of approximately 0.01619752.

Table 1: State-wise Population Summary

State	Survey_Population	Doctoral_Degree	Predicted_Population
Alabama	51580	460	835.46807
Alaska	6972	51	112.92911
Arizona	74153	896	1201.09468
Arkansas	31288	251	506.78800
California	391171	6336	6336.00000
Colorado	59841	1031	969.27578
Connecticut	37369	600	605.28512
Delaware	9641	152	156.16029
District of Columbia	6718	311	108.81494
Florida	217799	2731	3527.80361
Georgia	109349	1451	1771.18259
Hawaii	14995	214	242.88181
Idaho	19884	175	322.07148
Illinois	128046	1457	2074.02761
Indiana	69843	620	1131.28337
Iowa	33586	258	544.00990
Kansas	29940	321	484.95374
Kentucky	46605	448	754.88541
Louisiana	45040	450	729.53629
Maine	14523	165	235.23658
Maryland	62442	1608	1011.40553
Massachusetts	73077	2014	1183.66615
Michigan	101512	991	1644.24263
Minnesota	58984	572	955.39451
Mississippi	29796	263	482.62130
Missouri	64551	621	1045.56610
Montana	11116	113	180.05163
Nebraska	19989	153	323.77222
Nevada	30749	282	498.05753
New Hampshire	14077	244	228.01249
New Jersey	93166	1438	1509.05813
New Mexico	20243	350	327.88639
New York	203891	2829	3302.52850
North Carolina	109230	1421	1769.25508
North Dakota	8107	60	131.31329

State	Survey_Population	Doctoral_Degree	Predicted_Population
Ohio	120666	1213	1954.48992
Oklahoma	39445	281	638.91117
Oregon	43708	647	707.96119
Pennsylvania	132605	1620	2147.87211
Rhode Island	10401	177	168.47040
South Carolina	54651	647	885.21065
South Dakota	9296	71	150.57214
Tennessee	72374	841	1172.27929
Texas	292919	3216	4744.56129
Utah	35537	428	575.61126
Vermont	6860	131	111.11499
Virginia	88761	1531	1437.70805
Washington	80818	1195	1309.05115
West Virginia	18135	159	293.74202
Wisconsin	61967	513	1003.71171
Wyoming	5962	72	96.56961

explanation

It is biased to assume that the proportion in one state (e.g., California) is representative of other states. The reasons for the bias in the projections are as follows:The main reasons for differences between estimated and actual respondent numbers include the similarity assumption, which presumes uniformity across states in the ratio of doctoral degree holders. However, each state has unique demographics, economic conditions, and educational policies. States with more universities and research institutions naturally have more doctoral degree holders compared to rural or economically less developed states. Additionally, the non-uniform distribution of advanced degrees is evident: regions dominated by high-skill industries like technology, healthcare, or academia (e.g., California's Silicon Valley or Boston's healthcare hubs) have higher demand for and attainment of advanced degrees. These areas offer favorable job markets for advanced degree holders, attracting more individuals pursuing such qualifications. In contrast, states with less advanced economies show significant differences in degree distribution. Extrapolating national estimates based on high-tech regions can distort results, misrepresenting rural or non-high-tech areas. Lastly, sampling bias may occur if the sample data does not fully represent the population in certain states, leading to inaccurate estimates of educational attainment.