Analysis of 2022 USA Census,Focus On Actual Number of Respondent With A Doctoral Degree In Each State Compare To Estimated Number

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November 11, 2024

1 Obtaining the data

The data(Steven Ruggles and Schouweiler 2023) was gathered from the IPUMS USA database (https://usa.ipums.org/usa/index.shtml). Use the "Get Data" button on the website, then go to "SELECT SAMPLE". Be sure to deselect all of the default samples. Then check box next to the "2022 ACS", and hit "SUBMIT SAMPLE SELECTIONS". Next we choose which variables we need. Begin be opening the drop-down "HOUSEHOLD" menu, and selecting "GEOGRAPHIC". Then add "STATEICP" to the variable cart by clicking on the plus button. Next expand the drop-down "PERSON" menu, and select "DEMOGRAPHIC". Then add "Sex" to the variable cart. Finally, expand the drop-down "PERSON" menu, and select "EDUCATION". Then add "EDUC" to the variable cart. Then click "VIEW CART", and "CREATE DATA EXTRACT". Be sure to check the option available to ensure you are able to work with the data you will extract. Finally, hit "SUBMIT EXTRACT", note, you will have to create an account if you do not have one. But fear not, your extract request will be saved while you do this.

2 Number of Respondents With A Doctoral Degree As Their Highest Educational Attainment

Table 1: Number of Respondents With A Doctoral Degree as Their Highest Educational Attainment

STATEICP	number_doc
1	15107
2	4963
3	32054
4	5794
5	4080
6	2720
11	3665
12	37817
13	77407
14	42666
21	44247
22	19515
23	31844
24	36885
25	19261
31	10186
32	9382
33	20657
34	18661
35	6473
36	2606
37	2779
40	34227
41	14588
42	7571
43	79544
44	36016
45	11893
46	8022
47	38547
48	17806
49	93109
51	13082
52	25427
53	9254
54	21109
56	4637
61	24489

STATEICP	number_doc
62	25324
63	5812
64	3646
65	9063
66	6119
67	11272
68	1842
71	138590
72	15735
73	30869
81	1653
82	5488
98	4041

3 Estimated respondent Vs. Actual respondent

The ratio was calculated by 391,171 divided by the total number of respondent with a PhD in California. Then apply this ration to the number of PhD in each State to get the estimated respondent value.

Table 2: Estimated respondent Vs. Actual respondent

STATEICP	Estimated_respondent	Actual_respondent
1	42640	37369
2	14008	14523
3	90473	73077
4	16354	14077
5	11516	10401
6	7677	6860
11	10344	9641
12	106739	93166
13	218482	203891
14	120425	132605
21	124887	128046
22	55081	69843
23	89880	101512
24	104108	120666
25	54364	61967
31	28750	33586

STATEICP	Estimated_respondent	Actual_respondent
32	26481	29940
33	58304	58984
34	52671	64551
35	18270	19989
36	7355	8107
37	7844	9296
40	96606	88761
41	41175	51580
42	21369	31288
43	224513	217799
44	101655	109349
45	33568	45040
46	22642	29796
47	108799	109230
48	50258	54651
49	262801	292919
51	36924	46605
52	71768	62442
53	26119	39445
54	59580	72374
56	13088	18135
61	69120	74153
62	71477	59841
63	16404	19884
64	10291	11116
65	25580	30749
66	17271	20243
67	31815	35537
68	5199	5962
71	391171	391171
72	44412	43708
73	87128	80818
81	4666	6972
82	15490	14995
98	11406	6718

Difference between them:

The reason the estimates based on the Laplace ratio might differ from the actual number of respondents in each state is due to variability in educational attainment levels between states. The ratio of doctoral degree holders to the total population may not be constant across all

states, as factors like access to education, state population size, and the number of universities within the state can affect the number of individuals pursuing and achieving doctoral degrees. For example, states with major research universities or higher proportions of professionals may have higher ratios of doctoral degree holders. Hence, applying California's ratio to all other states may not accurately reflect the educational composition of smaller or less academic states. Because of these factors, the assumption that the ratio of doctoral degree holders in California is representative of other states is likely flawed, leading to potential differences between the estimates and actual values.

References

Steven Ruggles, Matthew Sobek, Sarah Flood, and Megan Schouweiler. 2023. "IPUMS USA: Version 15.0 [dataset]." IPUMS. https://doi.org/10.18128/D014.V4.0.