

Doctoral Degree Respondents by State

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Data Acquisition

The data for this analysis is sourced from the IPUMS USA website (<https://usa.ipums.org/usa/index.shtml>), which provides access to various census datasets. To obtain the data, navigate to the “Change Samples” section and select the ACS 2022 dataset. During the variable selection process, be sure to include **STATEICP** (state in ICPSR code), **SEX** (gender), and **EDUC** (general educational attainment). Selecting EDUC will also include EDUCD (detailed educational attainment codes, including those for doctoral degrees). After choosing the desired variables, follow the prompts to create and download the data extract in CSV format for further analysis.

Methodology: the ratio estimators approach

The ratio estimators approach is a statistical technique used to estimate population totals by leveraging known relationships between two variables. In this method, a ratio is calculated using a sample dataset, which relates the quantity of interest to a broader population metric. Specifically, this approach involves determining the ratio of a specific subgroup (e.g., respondents with doctoral degrees) to the total number of respondents within the sample.

For example, if we denote the number of respondents with doctoral degrees in a state as (Y) and the total number of respondents in that state as (N), the ratio can be expressed as:

$$\hat{R} = \frac{Y}{N}$$

Once this ratio is established, it can be applied to the known total number of respondents in the population to estimate the total number of individuals within the subgroup of interest. This method is particularly useful in situations where direct measurements are challenging to obtain, allowing researchers to derive estimates that can inform policy decisions and resource allocation.

State (ICPSR)	Doctoral Degree Respondents	Estimated Total Respondents	Actual Total Respondents
1	600	37043	37369
2	165	10187	14523
3	2014	124340	73077
4	244	15064	14077
5	177	10928	10401
6	131	8088	6860
11	152	9384	9641
12	1438	88779	93166
13	2829	174656	203891
14	1620	100015	132605
21	1457	89952	128046
22	620	38277	69843
23	991	61182	101512
24	1213	74888	120666
25	513	31672	61967
31	258	15928	33586
32	321	19818	29940
33	572	35314	58984
34	621	38339	64551
35	153	9446	19989
36	60	3704	8107
37	71	4383	9296
40	1531	94521	88761
41	460	28399	51580
42	251	15496	31288
43	2731	168606	217799
44	1451	89582	109349
45	450	27782	45040
46	263	16237	29796
47	1421	87729	109230
48	647	39944	54651

State (ICPSR)	Doctoral Degree Respondents	Estimated Total Respondents	Actual Total Respondents
49	3216	198549	292919
51	448	27659	46605
52	1608	99274	62442
53	281	17348	39445
54	841	51922	72374
56	159	9816	18135
61	896	55317	74153
62	1031	63652	59841
63	175	10804	19884
64	113	6976	11116
65	282	17410	30749
66	350	21608	20243
67	428	26424	35537
68	72	4445	5962
71	6336	391171	391171
72	647	39944	43708
73	1195	73777	80818
81	51	3149	6972
82	214	13212	14995
98	311	19200	6718

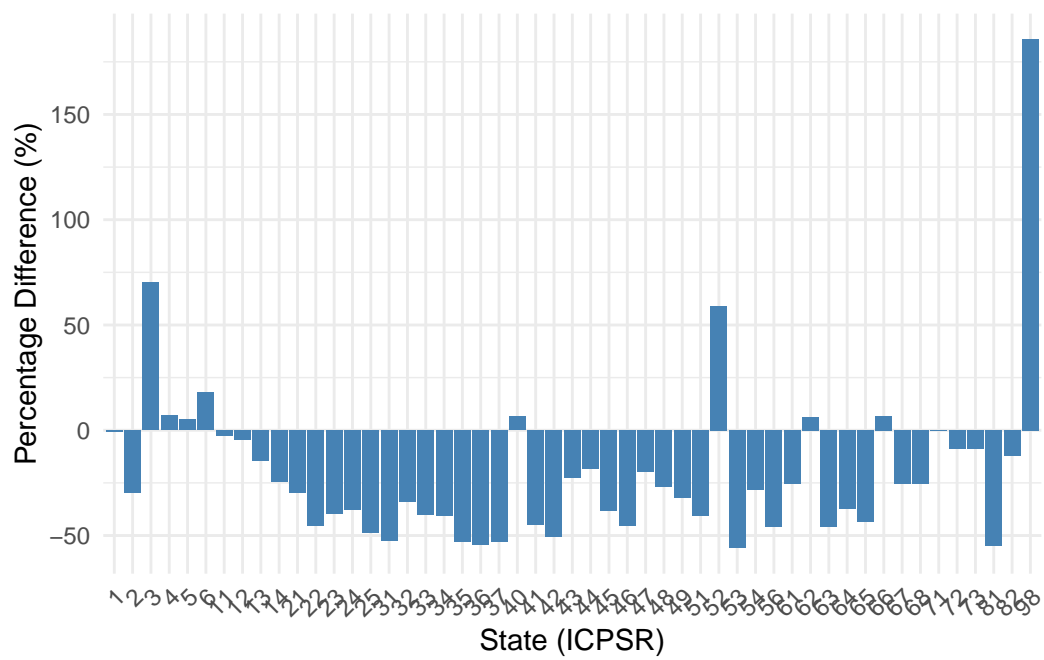


Figure 1