ACS2022

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Obtaining ACS 2022 Data

In order to obtain data for the 2022 American Community Survey:

- Login to the IPUMS USA site
- click "get data"
- go to "select sample"
- Un- select "default sample from each year"
- Select "2022 ACS"
- Then "submit sample selections"
- Select "household" then "geographic" then select 'Stateicp'
- Select "person" then "education" then select 'educ'
- After selecting the desired variables, click "View cart" and then click "create data extract".
- Once satisfied with the dimensions of the data click "submit extract" and wait for your data to finish downloading.

The data can be obtained at IPUMS USA, here. We will use ACS 2022 data from IPUMS (Ruggles et al. 2024) to estimate total respondents for each state.

Ratio Estimators Approach

The Ratio estimators were first used by Pierre-Simon Laplace in order to create a good estimate for the overall population of France. This was based on the numbered ratio of registered births to the number of inhabitants. Generally, the ratio estimator of a given population parameter is the ratio of two means. A prevalent variant of the ratio estimator that is used in ecology is capture and recapture. Here, the sample is captured, marked and then released. The researchers come back afterwards and capture another sample.

Ratio Calculation

The calculated Laplace ratio is around 0.01619. We used this to estimate the total respondents for each state.

Table 1: State vs. Number of Respondents with PhD

State ICP	Number of Respondents with PhD's
1	600
2	165
3	2014
4	244
5	177
6	131
11	152
12	1438
13	2829
14	1620
21	1457
22	620
23	991
24	1213
25	513
31	258
32	321
33	572
34	621
35	153
36	60
37	71
40	1531
41	460
42	251
43	2731
44	1451
45	450
46	263
47	1421
48	647
49	3216
51	448
52	1608

State ICP	Number of Respondents with PhD's
53	281
54	841
56	159
61	896
62	1031
63	175
64	113
65	282
66	350
67	428
68	72
71	6336
72	647
73	1195
81	51
82	214
98	311

Table 2: State vs. Estimated Total Respondents

State ICP	Total PhD Respondents	Estimated Total Respondents
1	600	37042.71
2	165	10186.74
3	2014	124340.02
4	244	15064.03
5	177	10927.60
6	131	8087.66
11	152	9384.15
12	1438	88779.02
13	2829	174656.37
14	1620	100015.31
21	1457	89952.04
22	620	38277.47
23	991	61182.21
24	1213	74888.01
25	513	31671.52
31	258	15928.36
32	321	19817.85
33	572	35314.05
34	621	38339.20

State ICP	Total PhD Respondents	Estimated Total Respondents
35	153	9445.89
36	60	3704.27
37	71	4383.39
40	1531	94520.64
41	460	28399.41
42	251	15496.20
43	2731	168606.06
44	1451	89581.62
45	450	27782.03
46	263	16237.05
47	1421	87729.48
48	647	39944.39
49	3216	198548.92
51	448	27658.56
52	1608	99274.46
53	281	17348.34
54	841	51921.53
56	159	9816.32
61	896	55317.11
62	1031	63651.72
63	175	10804.12
64	113	6976.38
65	282	17410.07
66	350	21608.25
67	428	26423.80
68	72	4445.12
71	6336	391171.00
72	647	39944.39
73	1195	73776.73
81	51	3148.63
82	214	13211.90
98	311	19200.47

Potential Reasons for Variance

As we are assuming that every state has the same proportion of respondents with doctoral degrees as California (a random state), we are ignoring the demographic variation between different states. Some states may have a higher average income level and therefore, higher levels of educational attainment. California could have more or less popular universities for doctoral degrees compared to other states; therefore, there might be a disproportional number

of doctoral degree holders in California due to this external factor. By sampling a random state (California), we are introducing sampling bias because certain types of people that live in California might disproportionally exhibit certain characteristics. Since we are selecting just 1 state for simplicity and ease, we are also introducing selection bias and convenience bias. One state is an unreasonably small sample size to represent all 50 U.S. states accurately.

References

Ruggles, Steven, Sarah Flood, Matthew Sobek, Daniel Backman, Annie Chen, Grace Cooper, Stephanie Richards, Renae Rodgers, and Megan Schouweiler. 2024. "IPUMS USA: Version 15.0 [ACS 2022]." Minneapolis, MN: IPUMS. https://doi.org/10.18128/D010.V15.0.