

# ACS2022

Fatima Yunusa, Michelle Ji, Jiaqi Lai, Lexi Knight, and Aliza Mithwani

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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](#)

## 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	37042.708
2	165	10186.745
3	2014	124340.024
4	244	15064.035
5	177	10927.599
6	131	8087.658
11	152	9384.153
12	1438	88779.024
13	2829	174656.370
14	1620	100015.312
21	1457	89952.043
22	620	38277.465
23	991	61182.207
24	1213	74888.009
25	513	31671.516
31	258	15928.365
32	321	19817.849
33	572	35314.049
34	621	38339.203

State ICP	Total PhD Respondents	Estimated Total Respondents
35	153	9445.891
36	60	3704.271
37	71	4383.387
40	1531	94520.644
41	460	28399.410
42	251	15496.200
43	2731	168606.061
44	1451	89581.616
45	450	27782.031
46	263	16237.054
47	1421	87729.481
48	647	39944.387
49	3216	198548.917
51	448	27658.556
52	1608	99274.458
53	281	17348.335
54	841	51921.530
56	159	9816.318
61	896	55317.111
62	1031	63651.720
63	175	10804.123
64	113	6976.377
65	282	17410.073
66	350	21608.247
67	428	26423.799
68	72	4445.125
71	6336	391171.000
72	647	39944.387
73	1195	73776.727
81	51	3148.630
82	214	13211.899
98	311	19200.470

### 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.