

Fisher's Exact Test

Verified Python analysis transcript

Test: Fisher's Exact Test

Design: Conditional exact analysis of a 2 x 2 sex-by-internet-access table.

Variables: sex, internet

Null hypothesis: The population odds ratio is one, conditional on both margins.

Primary formula: $P(a \mid \text{margins}) = \frac{C(a+b, a) C(c+d, c)}{C(N, a+c)}$

Valid source rows: 649

Verified results:

sample_odds_ratio: 1.3819265143992057

two_sided_p_value: 0.10823626316432064

observed_table_probability: 0.018486645108163866

fixed_row1: 383

fixed_col1: 151

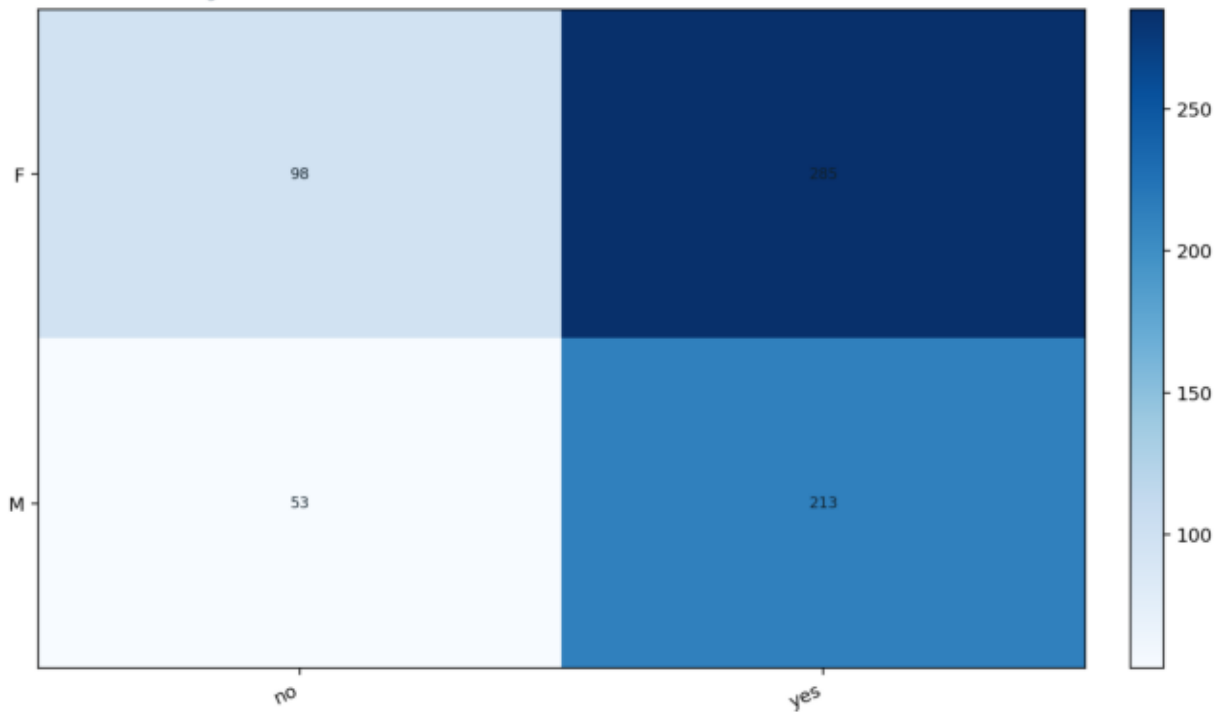
Interpretation:

Fisher two-sided p = 0.108236; sample odds ratio = 1.381927.

The p-value conditions on both observed margins and sums probabilities of tables no more likely than the observed table.

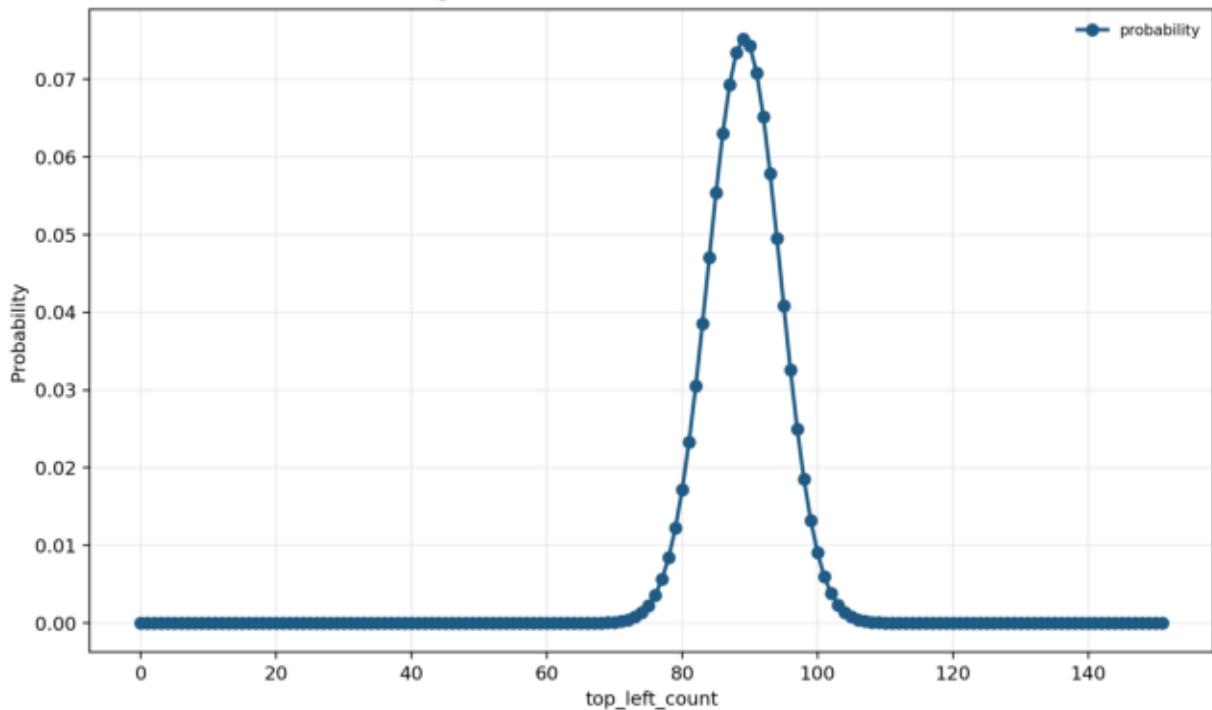
Sex and internet-access table

Observed fixed margins



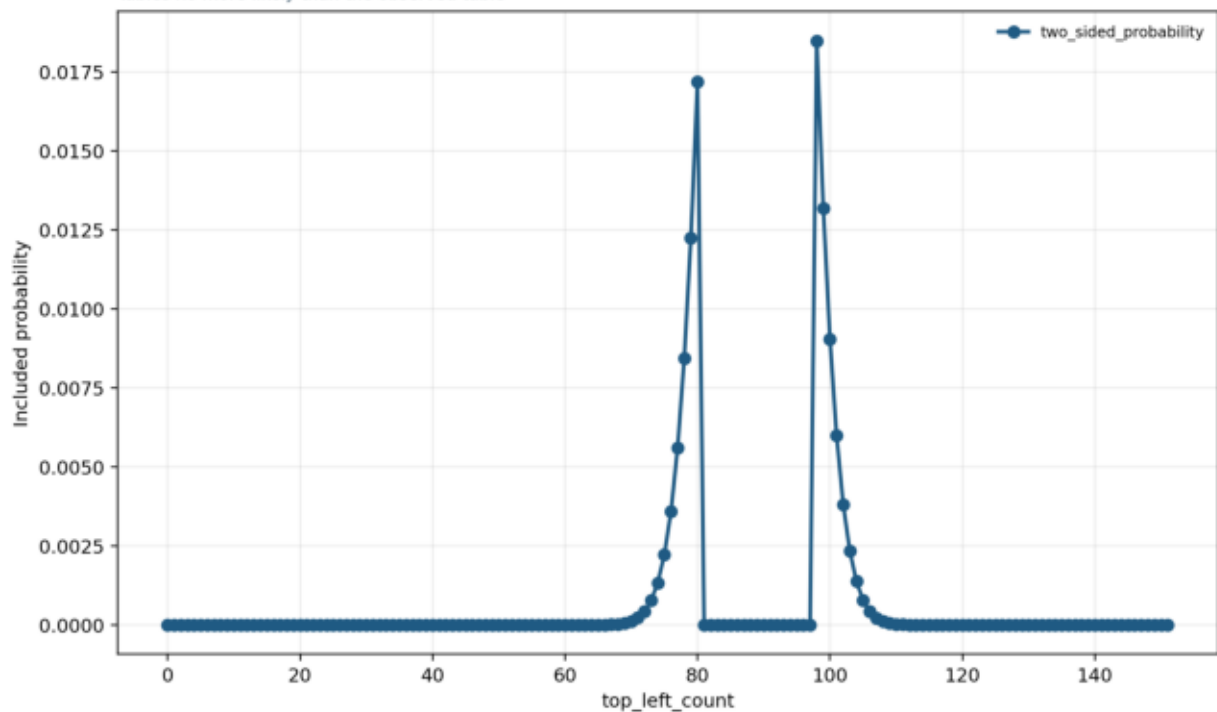
Conditional hypergeometric null distribution

All feasible tables with the observed margins



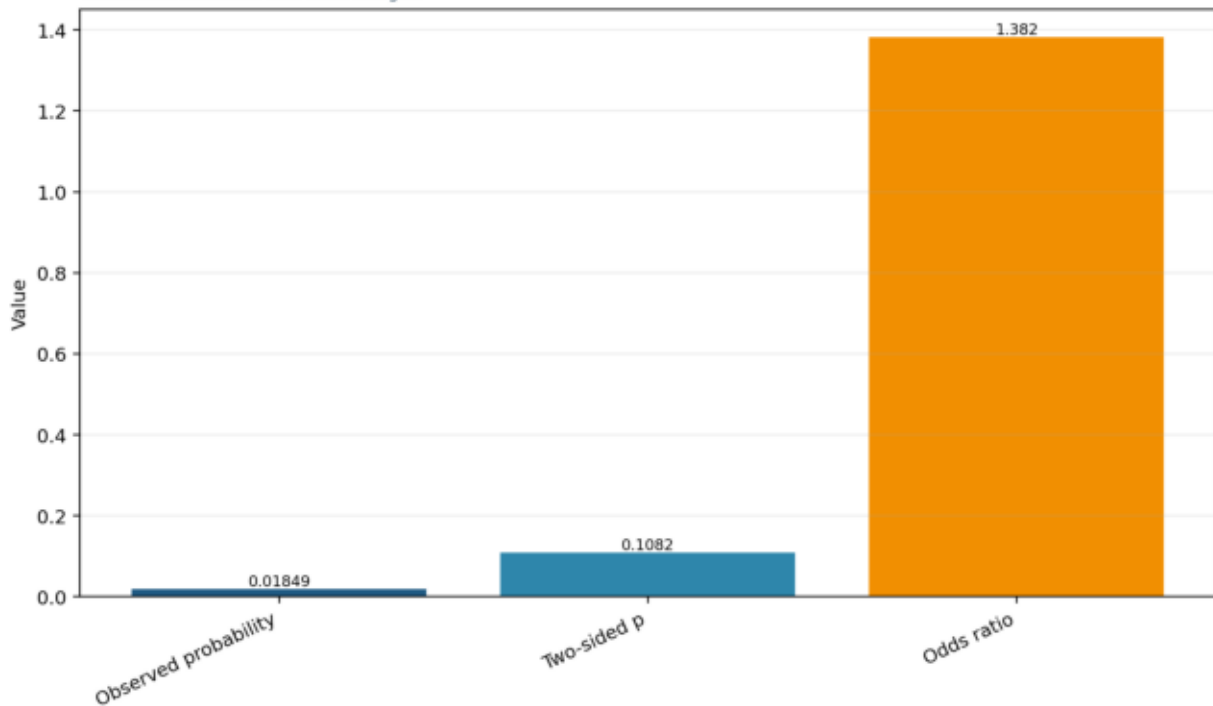
Two-sided probability-order region

tables no more likely than the observed table



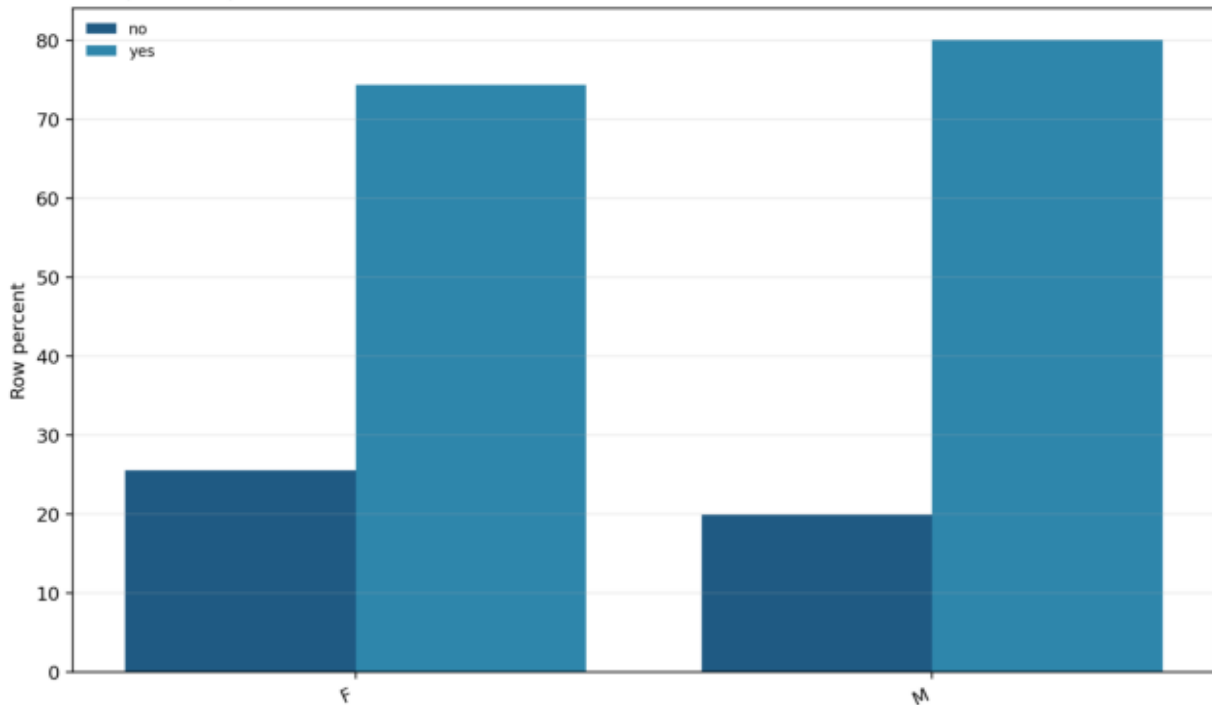
Fisher exact result components

Conditional inference with fixed margins



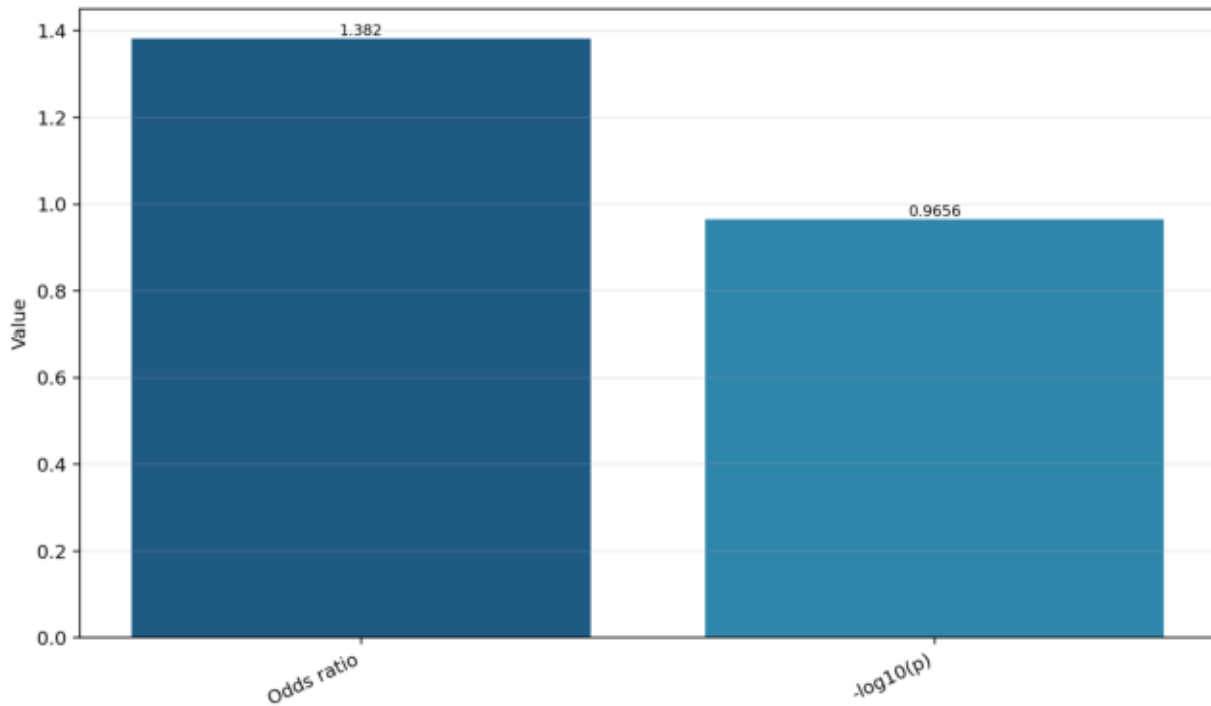
Internet-access percentages by sex

Descriptive effect pattern



Fisher exact result summary

Conditional 2 x 2 test



Observed 2X2

no	yes
98	285
53	213

Conditional Null Distribution

top_left_count	probability	included_two_sided
0	1.72223e-74	True
1	8.58635e-72	True
2	2.10255e-69	True
3	3.37175e-67	True
4	3.98376e-65	True
5	3.69912e-63	True
6	2.81195e-61	True
7	1.79994e-59	True
8	9.90407e-58	True
9	4.75901e-56	True
10	2.02193e-54	True
11	7.6724e-53	True
12	2.62191e-51	True
13	8.12555e-50	True
14	2.29729e-48	True
15	5.95564e-47	True
16	1.42208e-45	True
17	3.13979e-44	True
18	6.43224e-43	True
19	1.22645e-41	True
20	2.18253e-40	True
21	3.63396e-39	True
22	5.67399e-38	True
23	8.32489e-37	True
24	1.14991e-35	True
25	1.49794e-34	True
26	1.84313e-33	True
27	2.14527e-32	True