

Mantel-Haenszel Common Odds-Ratio Test

Verified Python analysis transcript

Test: Mantel-Haenszel Common Odds-Ratio Test

Design: Common sex-pass association across four study-time strata.

Variables: sex, G3 >= 10, studytime

Null hypothesis: The common odds ratio across strata equals one.

Primary formula: $X^2_{MH} = \frac{[\sum_h (a_h - E_h)]^2}{\sum_h \text{Var}(a_h)}$; $OR_{MH} = \frac{\sum(a_{hd_h}/n_h)}{\sum(b_{hc_h}/n_h)}$

Valid source rows: 649

Verified results:

`mantel_haenszel_statistic`: 0.9332564901051987

`p_value`: 0.33401815539707624

`degrees_of_freedom`: 1

`common_odds_ratio`: 0.7999116499170076

`ci_low`: 0.5101770460213892

`ci_high`: 1.254189408682497

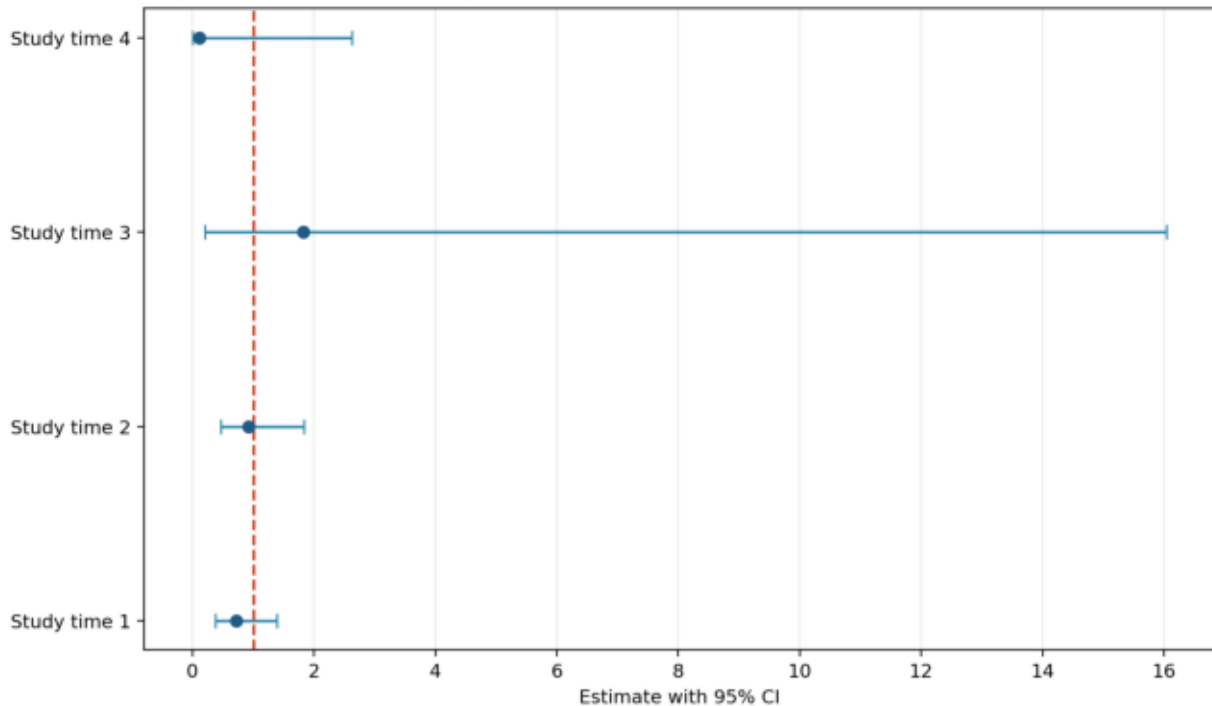
Interpretation:

Mantel-Haenszel chi-square = 0.933256, p = 0.334018.

The pooled odds ratio is 0.799912 with 95% CI [0.510177, 1.254189].

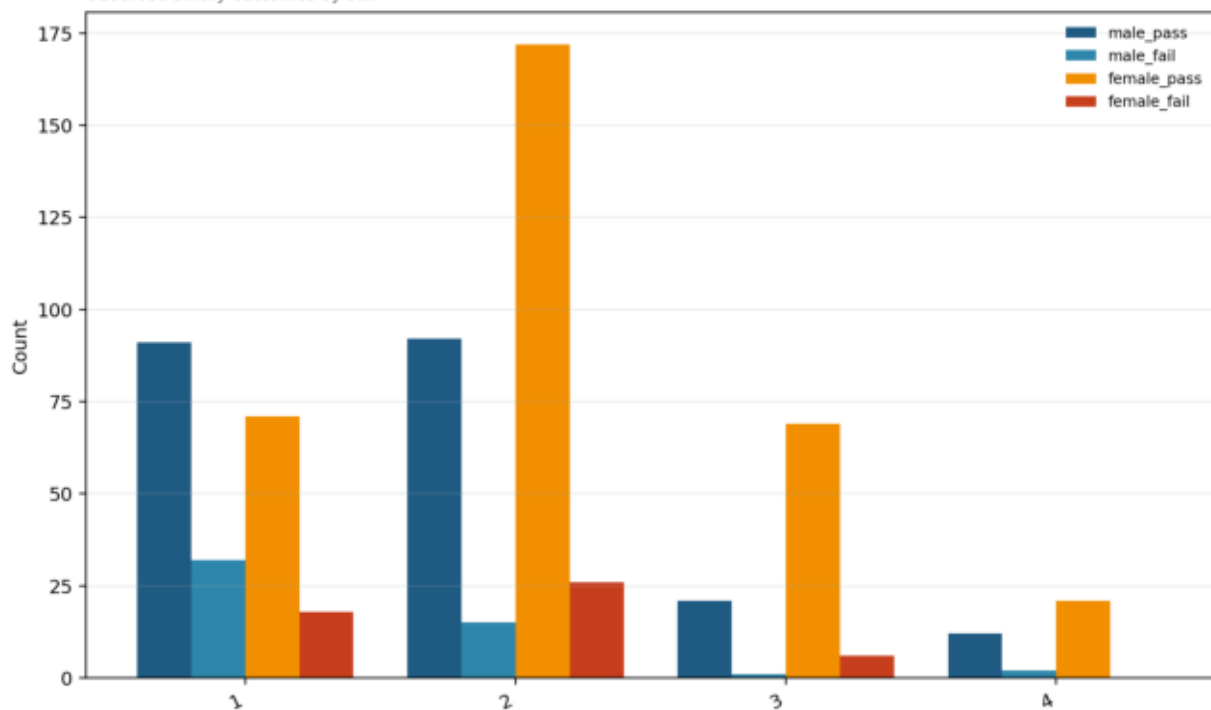
Common odds ratio across study-time strata

Sex-pass association within each study-time stratum



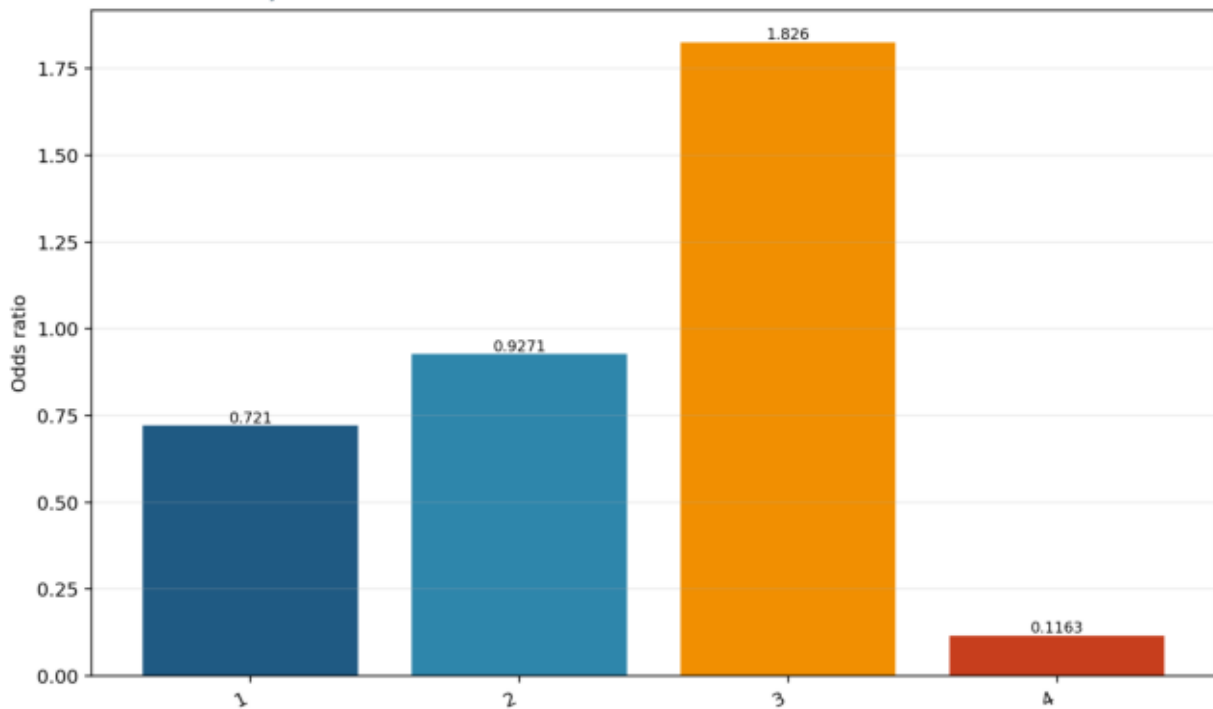
Stratum-specific 2 x 2 counts

Observed binary outcomes by sex



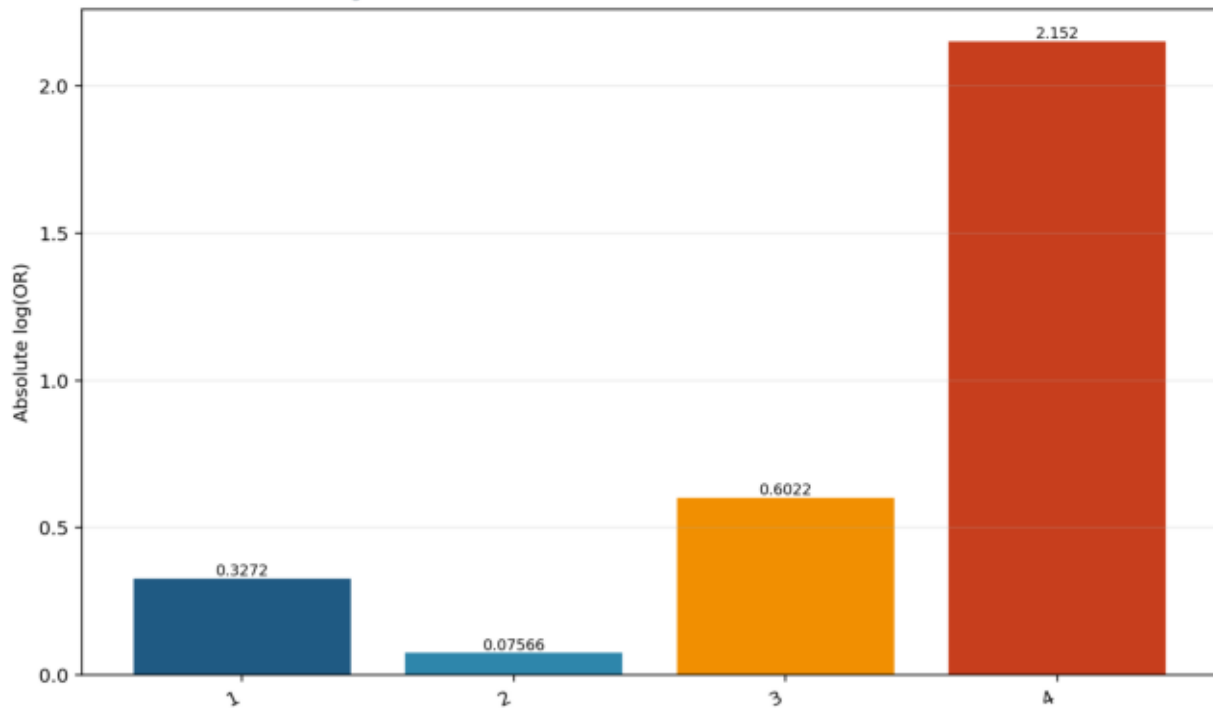
Odds-ratio heterogeneity profile

Variation across study-time levels



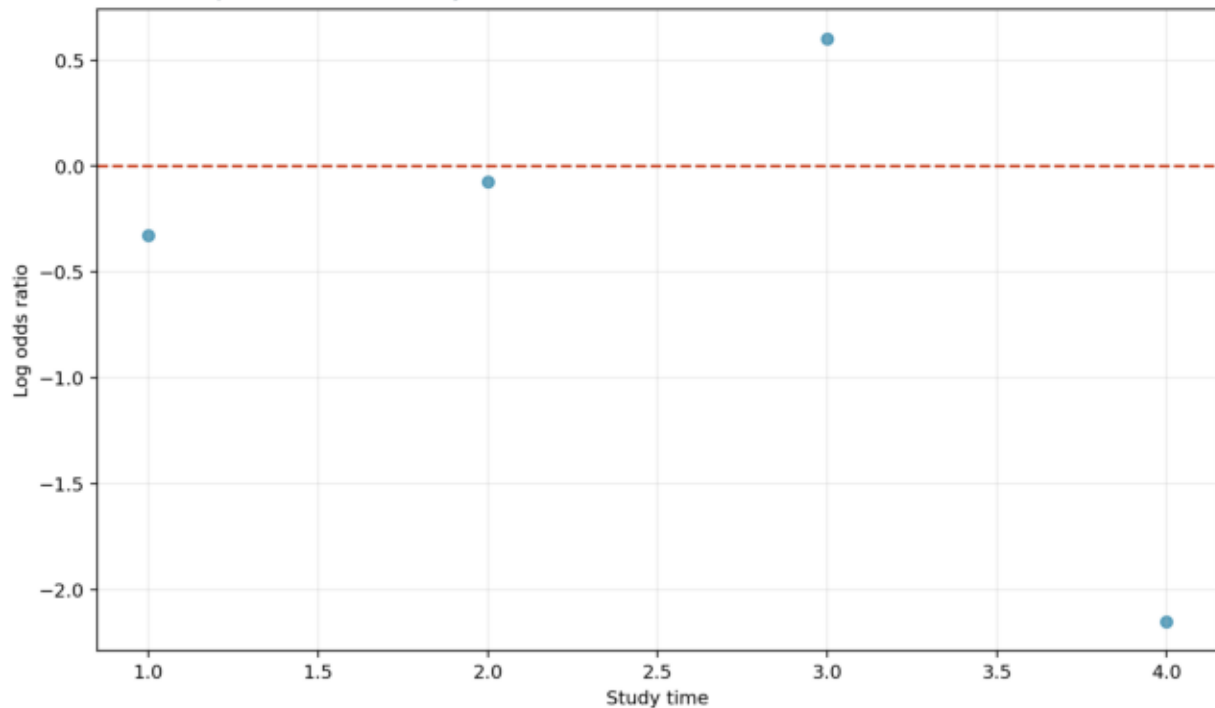
Absolute stratum log effects

Distance from the null on the log scale



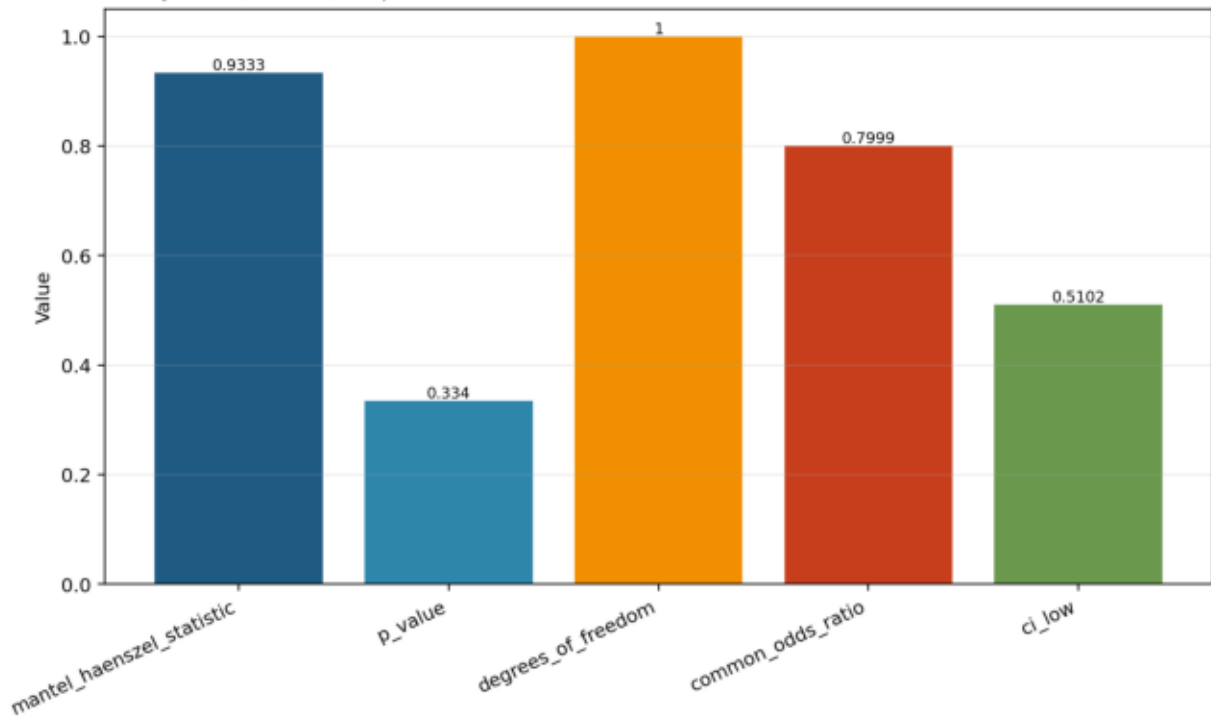
Log odds ratio by stratum

Direction and pattern across ordered study time



Stratified-test result summary

Primary statistic, evidence, and pooled effect



Stratum 2X2 Counts

male_pass	male_fail	female_pass	female_fail	odds_ratio
91	32	71	18	0.720951
92	15	172	26	0.927132
21	1	69	6	1.82609
12	2	21	0	0.116279

Stratum Odds Ratios

label	estimate	lower	upper
Study time 1	0.720951	0.374272	1.38875
Study time 2	0.927132	0.467793	1.83751
Study time 3	1.82609	0.207943	16.0361
Study time 4	0.116279	0.00515812	2.62127

Stratum Log Effects

Log odds ratio	Absolute log OR
-0.327185	0.327185
-0.0756596	0.0756596
0.602175	0.602175
-2.15176	2.15176