Summary of Table 1

- Appropriate analysis of Table 1 is crucial for any RCT or retrospective study. Unfortunately, this “correction” should be viewed with substantial skepticism.
- Of the 22 p values that were listed, 16 could **not** be replicated using the N provided and using the statistics listed in the methods. 6 of the 22 p values could also not be verified using the N reported and three different nonparametric statistics (chi-square, Fisher’s, and chi-square with Yates correction)
- The authors appear to have inappropriately reported the p value for another statistic than was listed in their methods. As the Yates correction is typically only run with N per cell of < 5[1] (see also BMJ guidance), the preponderance of the information in this “correction” is factually incorrect. This statistic was misapplied in many situations where the N was sufficiently large.
- It also shows exceedingly poor attention to detail that percentages appear to be calculated incorrectly three times and there were 19 rounding errors on this “corrected” table.

cancers MDPI

Correction

Correction: Bar-Sela et al. Cannabis Consumption Used by Cancer Patients during Immunotherapy Correlates with Poor Clinical Outcome. *Cancers* 2020, *12*, 2447

Gil Bar-Sela [1,2,*], Idan Cohen [1], Salvatore Campisi-Pinto [3], Gil M. Lewitus [3], Lanuel Oz-Ari [2], Ayellet Jehassi [4], Avivit Peer [5], Ilit Turgeman [5], Olga Vernicova [1], Paula Berman [3], Mira Wollner [5], Mor Moskovitz [5] and David Meiri [3,*]

1. See Wikipedia or most standard statistics textbooks

4.4 Statistical analysis (from Bar-Sala et al. *Cancers* 2020; 12:2447)

A series of χ^2 tests or Fisher's exact tests (when the assumptions of the parametric χ^2 test were not met) and nonparametric Mann–Whitney U tests were conducted to analyze the differences between patients' characteristics in both groups. Time to tumor progression (TTP) and overall survival (OS) was estimated using the Kaplan-Meier survival curve by group, and the log-rank test was computed to differentiate the survival curves between groups. Hazard ratios and the corresponding 95% CIs based on a Cox proportional hazards regression model were provided for multivariate analyses. We computed 2-tailed p-values, where $p < 0.05$ was considered a statistically significant result. Statistical analyses were performed using the SAS software package version 9.4 (SAS Institute, Cary, NC, USA).

Note that the methods section does **not** mention running chi-square with Yates correction. According to standard convention, this would be completed when the N for a cell was < 5.
https://en.wikipedia.org/wiki/Yates%27s_correction_for_continuity

I attempted to replicate the nonparametric statistics using:
https://www.graphpad.com/quickcalcs/contingency2/
Bold p-values on the next page (right 3 columns) correspond with those reported in the "corrected" table

BMJ's guidance on small N

Small numbers

When the numbers in a 2 x 2 contingency table are small, the χ^2 approximation becomes poor. The following recommendations may be regarded as a sound guide. (2) In fourfold tables a χ^2 test is inappropriate if the total of the table is less than 20, or if the total lies between 20 and 40 and the smallest expected (not observed) value is less than 5; in contingency tables with more than one degree of freedom it is inappropriate if more than about one fifth of the cells have expected values less than 5 or any cell an expected value of less than 1. An alternative to the χ^2 test for fourfold tables is known as Fisher's Exact test and is described in Chapter 9

Here is a description from the *British Medical Journal (*BMJ*)* on when the N expected per cell is so small as to be concerning. They note a total of all 4 cells should be between 20 and 40. This study has a total N of 68 + 34 = 102 so alternatives to chi-square would <u>generally</u> **<u>not</u>** be warranted. My reading of the above is that when more than one-fifth of cells (i.e. two of four) have expected (not observed) values of < 5, then Fisher's should be run. The corrected table contains observed (instead of expected) values but the 2x2 analyses for the data in K, M & O (label on 1st column of page 5) would be situation where Fisher's would be warranted.

https://www.bmj.com/about-bmj/resources-readers/publications/statistics-square-one/8-chi-squared-tests

< 10 guidance for use of Yates

When the values in a fourfold table are fairly small a "correction for continuity" known as the "Yates' correction" may be applied (3). Although there is no precise rule defining the circumstances in which to use Yates' correction, a common practice is to incorporate it into χ^2 calculations on tables with a total of under 100 or with any cell containing a value less than 10. The χ^2 test on a fourfold table is then modified as follows:

As will be seen, it does not appear that Fisher's was ever reported. Yates correction would be applied when the value of a single cell is between 0 and 9. This would apply to 2x2 tables from D, F, G, I, J, K, M, N, O, P, S, U, V.

Note that, even if the authors did run Yates, the circumstances of when they ran a chi-square and when they ran Yates should have been clearly but briefly described in the methods. Unfortunately, they were not.

Table 1. Demographics and medical conditions. (page 1)

	Characteristics	Cannabis Non-Users N = 68		Cannabis Users N = 34		p-Value	Chi-sq	Fishers	Chi-sq Yates
	Age in years median (range)	69 (18–92)		66 (37–85)		Why no t p-value?			
	Gender—N (%)								
A	Female	22 (32.4)	32.4	10 (29.5)	29.4				
	Male	46 (67.6)	67.6	24 (70.5)	70.6	0.9399	.7628	.8240	**.9399**
	Performance Status Eastern Cooperative Oncology Group (ECOG)—N (%)								
B	1≤	55 (80.8)	80.9	24 (70.5)	70.6	0.3568			
	≥2	13 (19.1)	19.1	10 (29.4)	29.4	0.3568	.2409	.3152	**.3568**
	Chronic diseases per patient—N (%)								
C	0	22 (32.3)	32.4	13 (22.0)	38.2	0.7124	.4908	.5136	.6398
D	1	16 (23.5)	**23.5**	7 (20.5)	20.6	0.9332	.7376	.8062	**.9332**
E	2 or more	30 (44.1)	**44.1**	14 (41.1)	41.2	0.9437	.7774	.8341	**.9437**
	Background diseases—N (%)								
F	Chronic heart disease	18 (26.4)	26.5	5 (14.7)	14.7	0.2762	.1802	.2162	.2762
G	Diabetes	17 (25.0)	25.0	6 (17.6)	17.6	0.5576	.4022	.4606	.5576
H	High blood pressure	34 (50.0)	50.0	13 (34.1)	38.2	0.3612	.2611	.2971	**.3612**
I	Chronic obstructive pulmonary disease (COPD)	9 (13.2)	13.2	3 (8.8)	8.8	1	.5145	.7463	.7445
J	Hyperlipidemia	23 (33.8)	33.8	7 (20.5)	20.6	0.2491	.1436	.1737	.2174
K	Other	2 (2.9)	2.9	0 (0.0)	0.0	1	.3125	.5512	.8007
	Type of malignancy—N (%)								
L	Non-small cell lung cancer	37 (54.4)	54.4	20 (58.8)	58.8	0.8325	.6723	.8327	**.8325**
M	Melanoma	25 (36.7)	36.8	9 (26.4)	26.5	0.414	.2985	.3750	.4140
N	Renal cell carcinoma	4 (5.8)	5.9	2 (5.8)	5.9	1	**1.000**	**1.000**	**1.000**
O	Other	2 (2.9)	2.9	3 (8.8)	8.8	1	.1946	.3300	.4175
	Main site of metastasis—N (%)								
P	Brain	12 (17.6)	17.6	8 (13.2)	23.5	0.6593	.4806	.5976	.6593
Q	Lungs	39 (57.3)	57.4	23 (67.6)	67.6	0.4303	.3155	.3914	**.4303**
R	Liver	13 (19.1)	19.1	11 (32.3)	32.4	0.2157	.1374	.1468	**.2157**

Green = correctly reported %, Red = rounding error, Yellow highlights = percentage reporting error

Bold matches reported p-value
red = incorrect test, green = correct test

Summary of Page 1 of Table 1

Of 18 provided p values, only 1 could be verified using the statistics specified in the methods section.

Of the 18 provided p values, 12 had p values that could be replicated but only by using a **different statistic** than was described in the methods section (chi-square with Yates correction).

Of the 18 provided p values, 5 could not be verified using either chi-sq or Fisher's (i.e. the statistics in the methods) or with chi-square with Yates correction.

There were 3 percentages whose calculations were incorrectly reported by at least 4.0% (Min = 4.1%, Max = 13.2%)

There were 14 errors of rounding (difference always = 0.1%).

A minor omission is that it would be more conventional to list a p-value (e.g. t-test) for the group comparison for age.

Table 1. *Cont.* (page 2)

	Characteristics	Cannabis Non-Users N = 68		Cannabis Users N = 34		*p*-Value	P values: Chi-sq	Fisher's	Chi-sq w/Yates
S	Immunotherapy given as—*N* (%)								
	First line of treatment	31 (45.5)	45.6	8 (23.5)	23.5	0.05178	.0307	.0334	.0518
	Second line of treatment or more	37 (54.4)	54.4	26 (76.4)	76.5	0.05178			
T	Checkpoint therapy—*N* (%)								
	Anti PD1: Pembrolizumab or Nivolumab	47 (69.1)	69.1	29 (85.2)	85.3	0.127	.0772	.0945	.1270
U	Ipilimumab and Nivolumab	16 (23.5)	23.5	4 (11.7)	11.8	0.2517	.1583	.1934	.2517
V	Anti PDL-1: Durvalumab or Atezolizumab	5 (7.3)	7.4	1 (2.9)	2.9	1	..3720	.6607	.6554

Key: green = % calculated (rounded) correctly
red = % calculated (rounding) incorrectly

P values calculated with GraphPad Prism. Although it is theoretically possible that the differences are due to software (Bel-Sala used SAS), we think this is exceedingly unlikely for simple non-parametric statistic like this. It is much more likely (based on values corresponding to 4 decimal places) that the authors simply ran a different statistic than was reported. Unfortunately, the statistic that was run (chi-square with Yates correction) is (again) only appropriate with a cell N of < 5.

Summary of Page 2 of Table 2

Table 1 tests for the equivalence between groups which is a core component of any observational study.

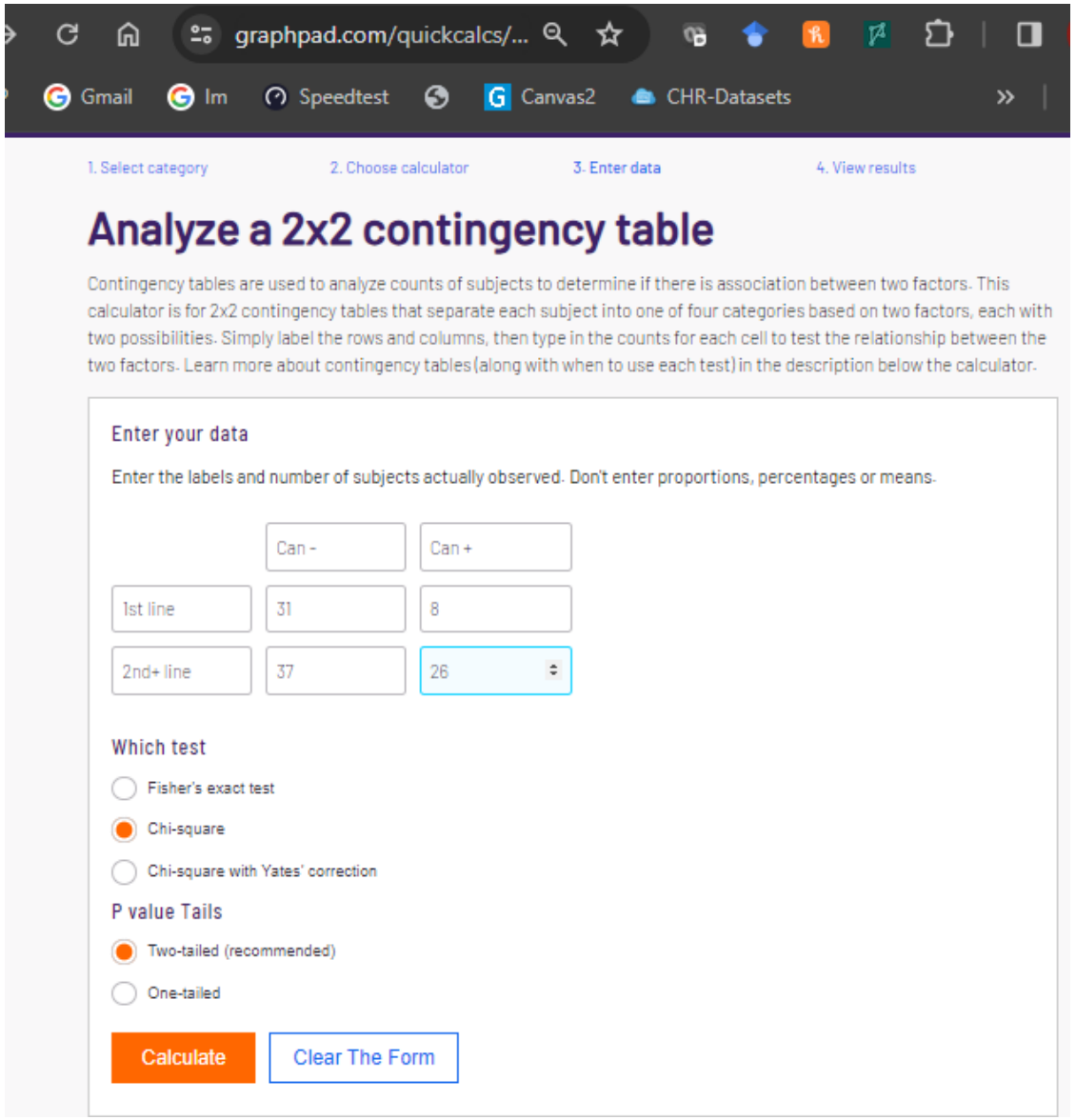
Importantly, the results section does **not** note that the two groups were statistically different at baseline regarding whether immunotherapy was first or second line. This is a major oversight that substantially impacts the interpretation of this study.

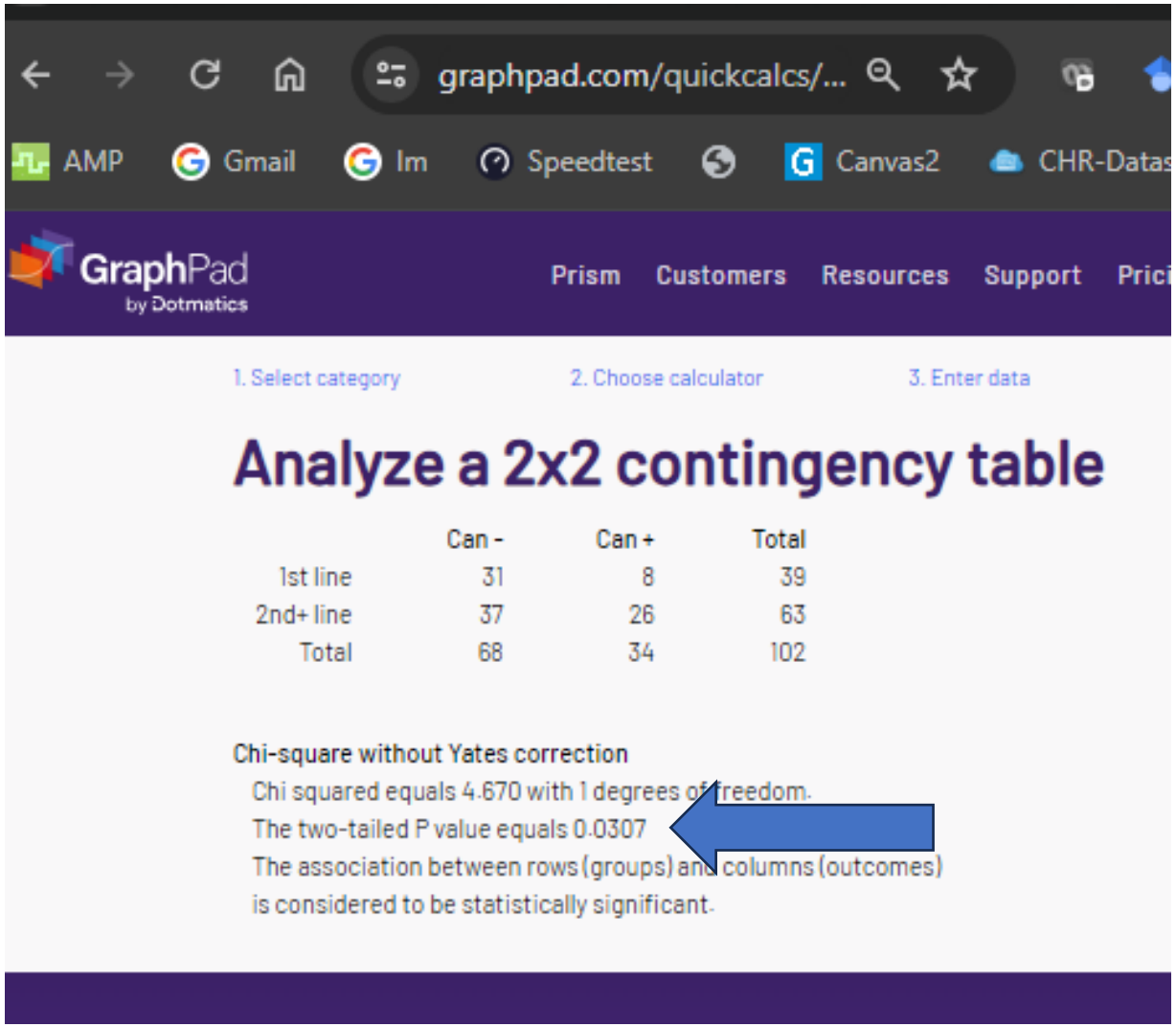
Of the 4 statistics on this page, only 1 was “correct”.

2 statistics could not be verified using the statistics specified in the methods. However, the p-value could be obtained using a different statistic (chi-square with Yates correction) than was in their methods for 3 p values.

1 statistic could not be verified.

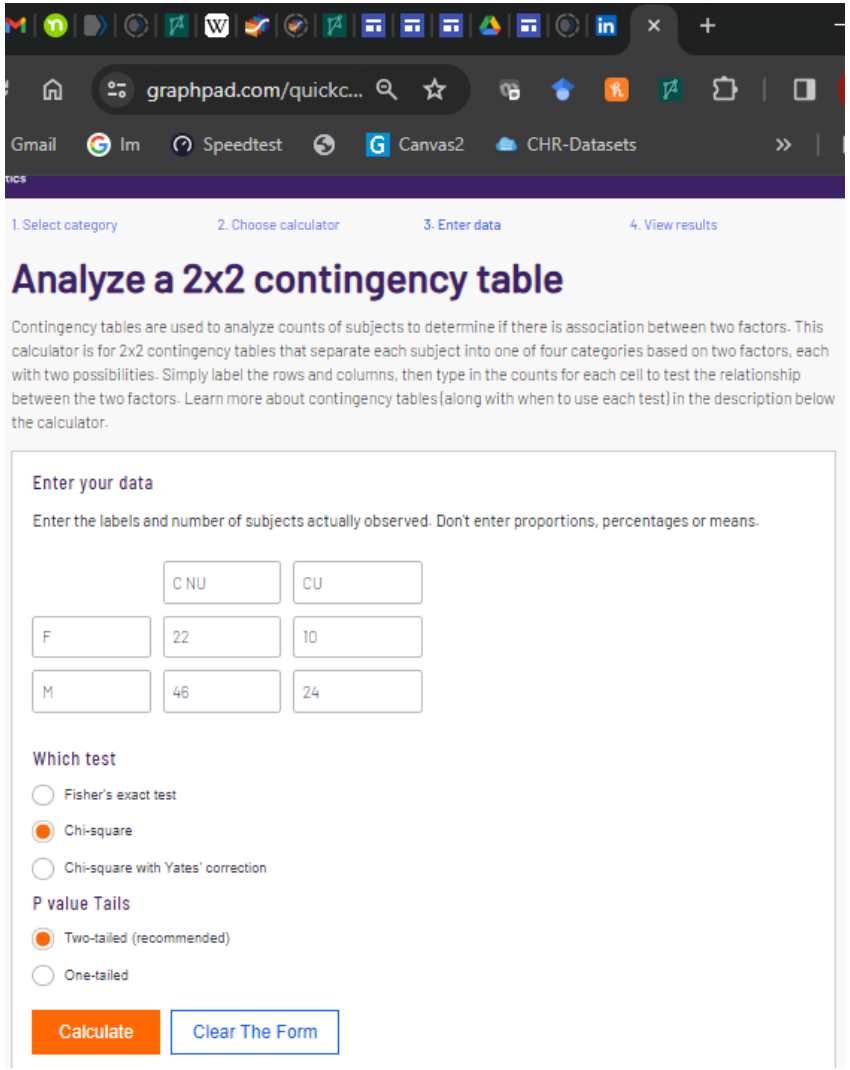
Although minor, of the 10 percentages that were listed, 5 had rounding errors.

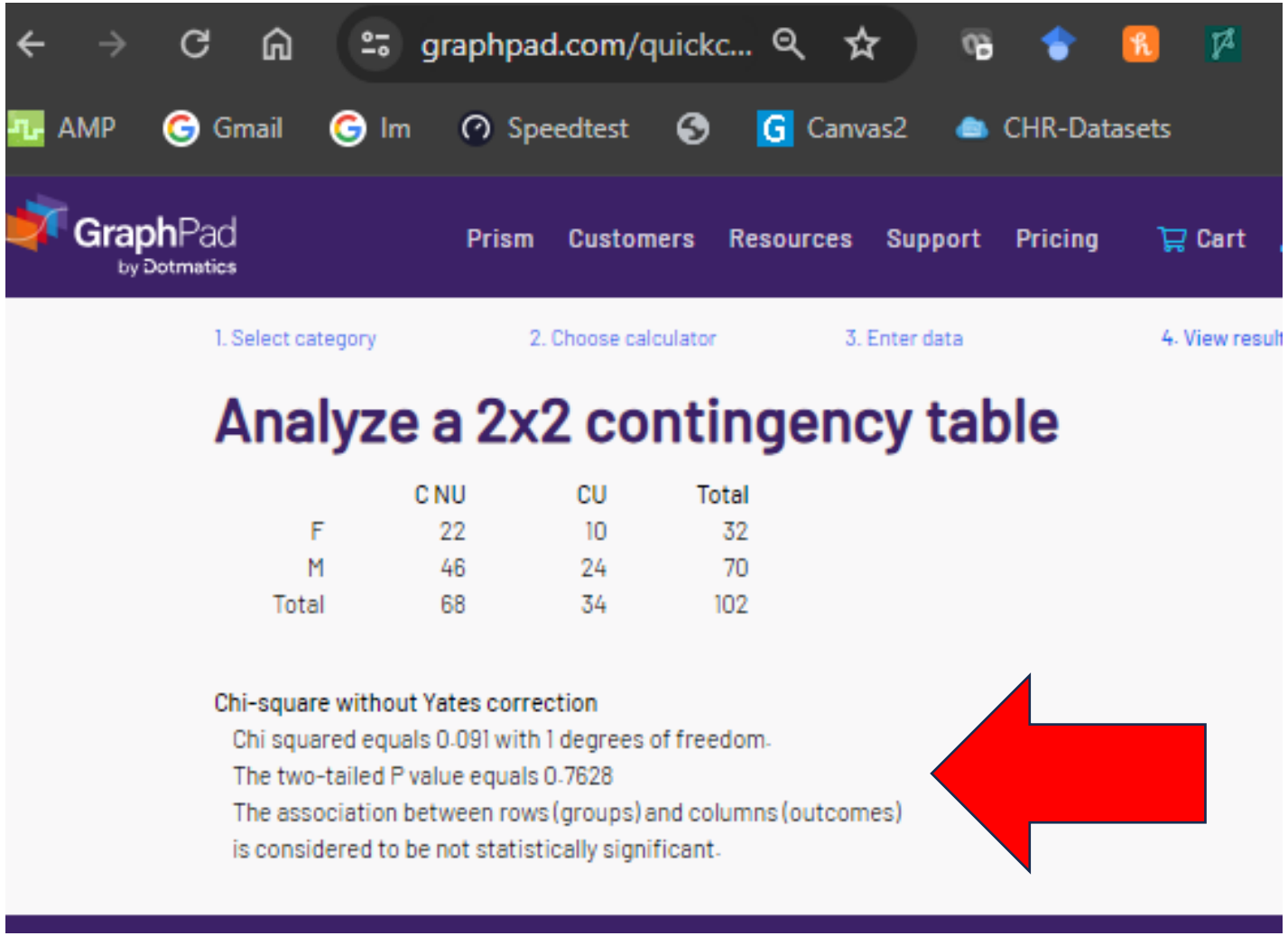




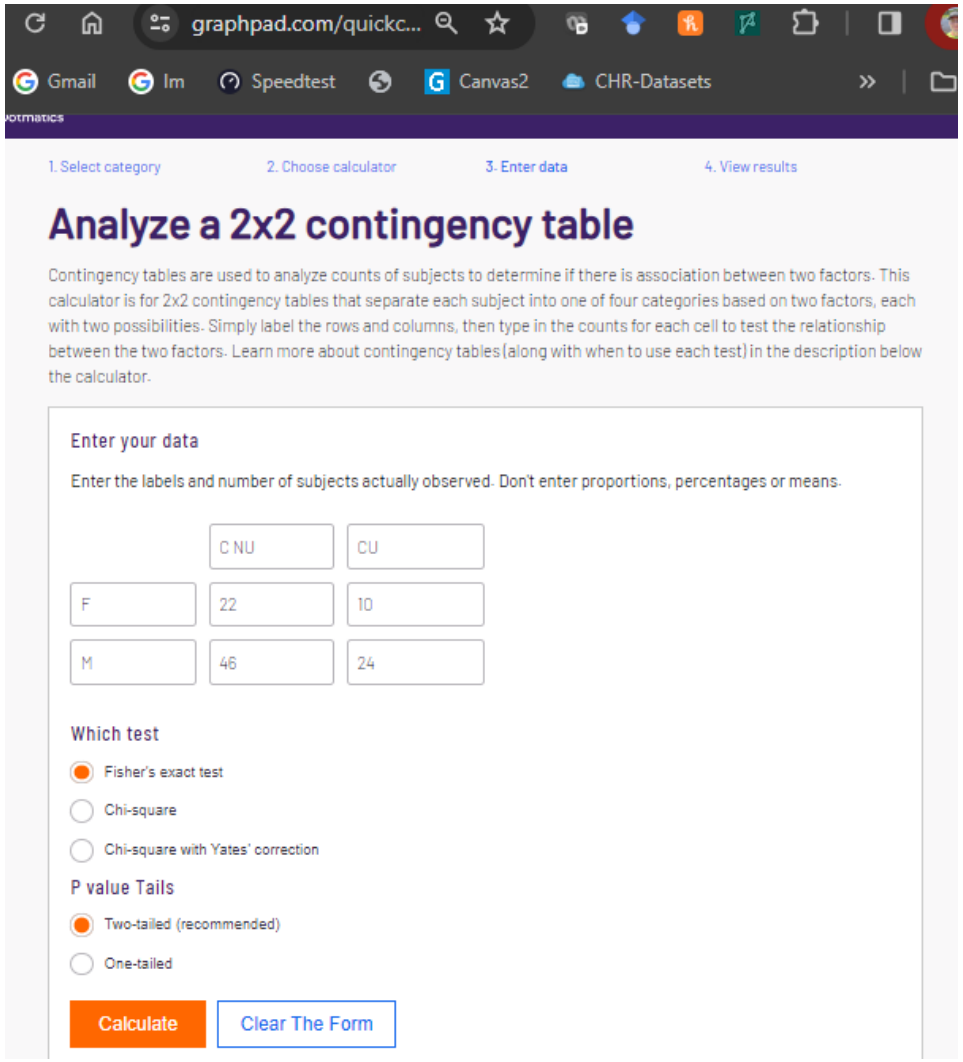
Here are the screen captures of the immunotherapy as first vs second line analysis.
The “Correction” reports the p-value as .05178 (i.e. non-significant). GraphPad show a p-value of .0317 (i.e. significant).

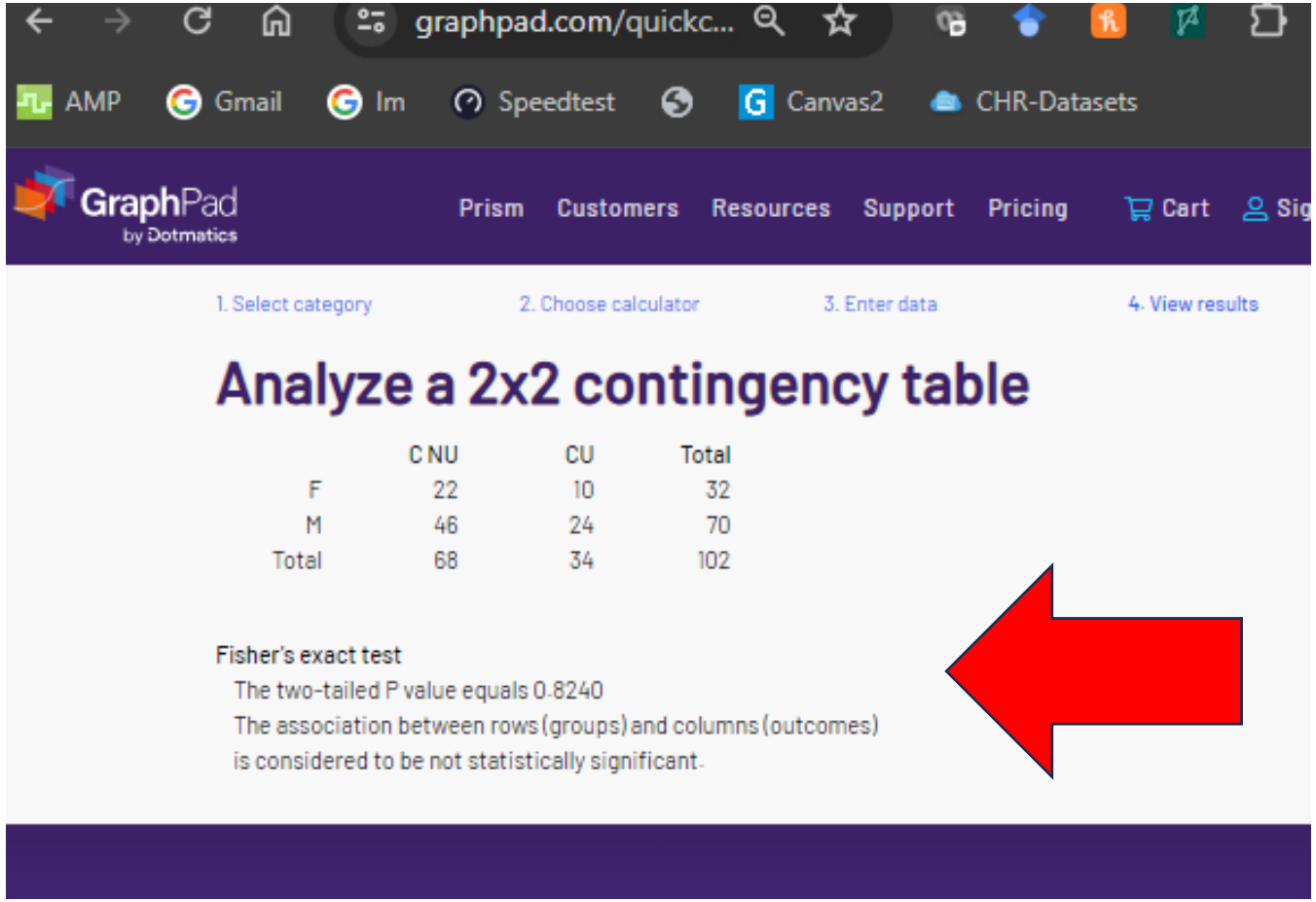
A. “corrected” chi-sq or Fishers p = .9399





A. “corrected” chi-sq or Fishers p = .9399





The “corrected” p value could not be verified for gender.

A. “corrected” chi-sq or Fishers p = .9399

Analyze a 2x2 contingency table

Contingency tables are used to analyze counts of subjects to determine if there is association between two factors. This calculator is for 2x2 contingency tables that separate each subject into one of four categories based on two factors, each with two possibilities. Simply label the rows and columns, then type in the counts for each cell to test the relationship between the two factors. Learn more about contingency tables (along with when to use each test) in the description below the calculator.

Enter your data

Enter the labels and number of subjects actually observed. Don't enter proportions, percentages or means.

	C NU	CU
F	22	10
M	46	24

Which test

- ○ Fisher's exact test
- ○ Chi-square
- ● Chi-square with Yates' correction

P value Tails

- ● Two-tailed (recommended)
- ○ One-tailed

Calculate | Clear The Form

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aphPad by Dotmatics | Prism | Customers | Resources | Support | Pricing | Cart | Sign

1. Select category | 2. Choose calculator | 3. Enter data | 4. View results

Analyze a 2x2 contingency table

	C NU	CU	Total
F	22	10	32
M	46	24	70
Total	68	34	102

Chi-square with Yates correction

Chi squared equals 0.006 with 1 degrees of freedom.

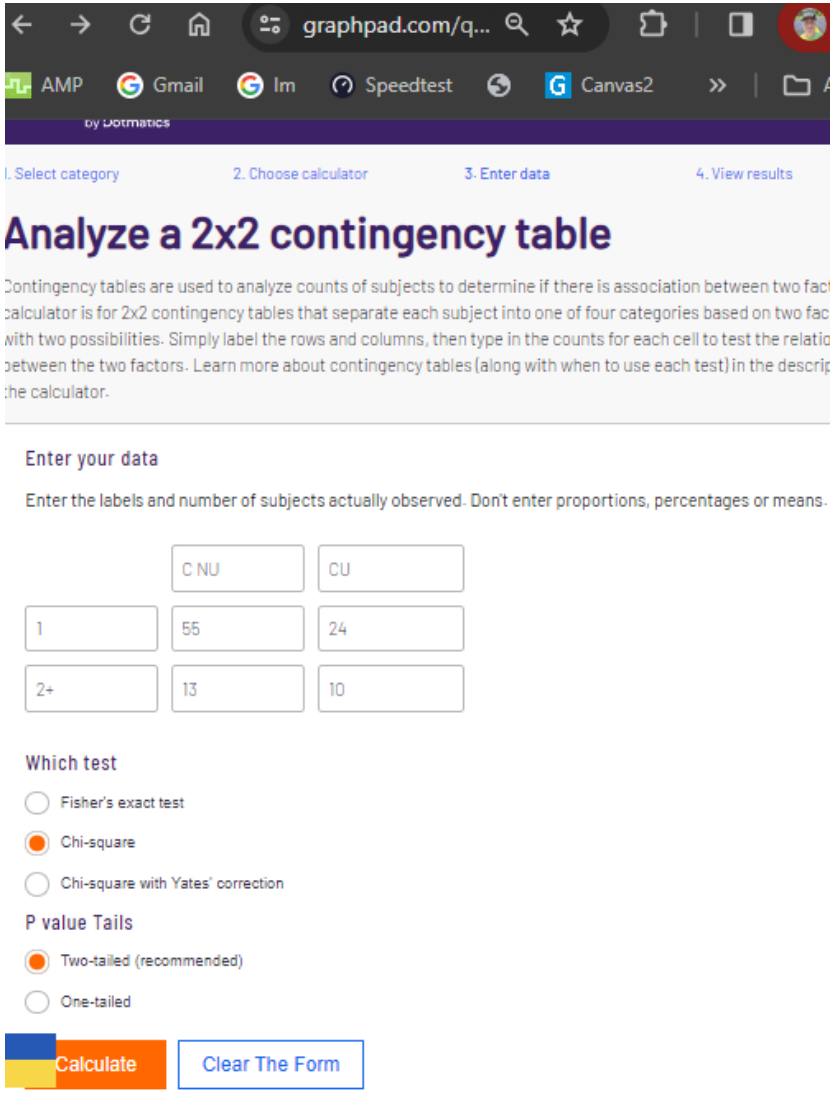
The two-tailed P value equals 0.9399

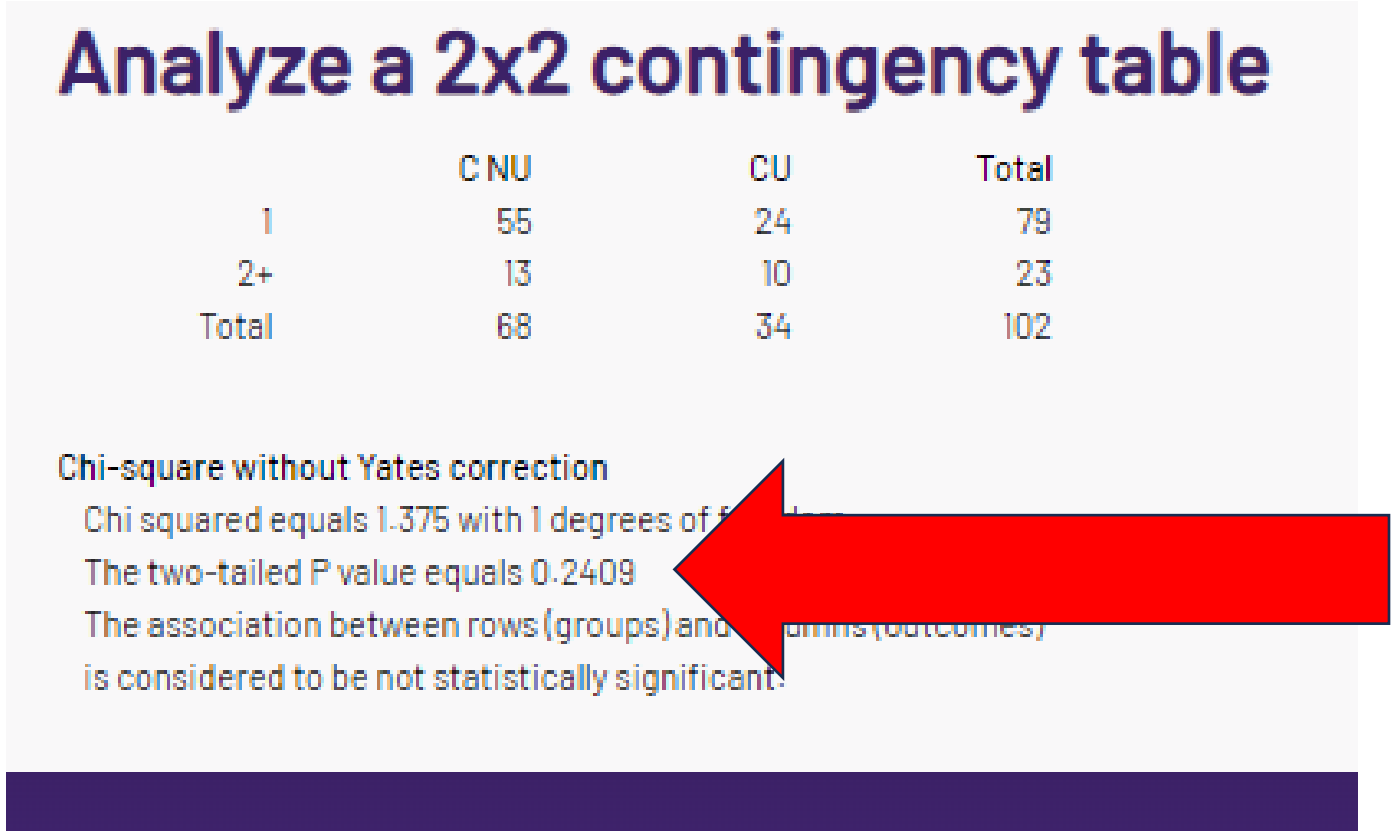
The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.

Note large (> 10) cell size

The “corrected” p value for gender **does** correspond with that of another (arguably inappropriate, not in methods) test.

B. “corrected” chi-sq or Fisher’s p = .3568





B. “corrected” chi-sq or Fishers p = .3568

Analyze a 2x2 contingency table

Contingency tables are used to analyze counts of subjects to determine if there is association between two factors calculator is for 2x2 contingency tables that separate each subject into one of four categories based on two factors with two possibilities. Simply label the rows and columns, then type in the counts for each cell to test the relationsh between the two factors. Learn more about contingency tables (along with when to use each test) in the descriptior the calculator.

Enter your data

Enter the labels and number of subjects actually observed. Don't enter proportions, percentages or means.

	C NU	CU
1	55	24
2+	13	10

Which test

- (●) Fisher's exact test
- ( ) Chi-square
- ( ) Chi-square with Yates' correction

P value Tails

- (●) Two-tailed (recommended)
- ( ) One-tailed

Calculate | Clear The Form

GraphPad by Dotmatics

1. Select category 2. Choose calculator 3. Enter data 4. Vi

Analyze a 2x2 contingency table

	C NU	CU	Total
1	55	24	79
2+	13	10	23
Total	68	34	102

Fisher's exact test

The two-tailed P value equals 0.3152

The association between rows (groups) and

is considered to be not statistically significant

The reported ECOG p values could not be verified with chi-square or Fisher’s The cell size >= so Yates would not be warranted according to the BMJ guidance.

B. “corrected” chi-sq or Fishers p = .3568

Analyze a 2x2 contingency t

Contingency tables are used to analyze counts of subjects to determine
calculator is for 2x2 contingency tables that separate each subject into
with two possibilities. Simply label the rows and columns, then type in t
between the two factors. Learn more about contingency tables (along w
the calculator.

Enter your data

Enter the labels and number of subjects actually observed. Don't en

	C NU	CU
1	55	24
2+	13	10

Which test

- Fisher's exact test
- Chi-square
- Chi-square with Yates' correction

P value Tails

- Two-tailed (recommended)
- One-tailed

Calculate | Clear The Form

GraphPad by Dotmatics

elect category | 2. Choose calculator | 3. Enter data | 4.

Analyze a 2x2 contingency table

	C NU	CU	Total
1	55	24	79
2+	13	10	23
Total	68	34	102

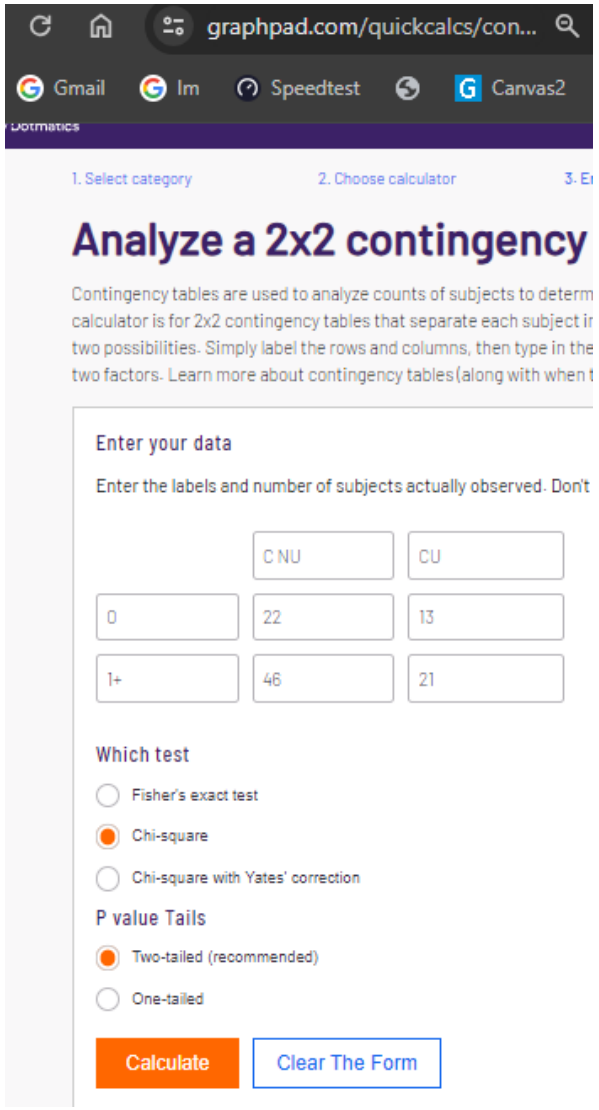
Chi-square with Yates correction

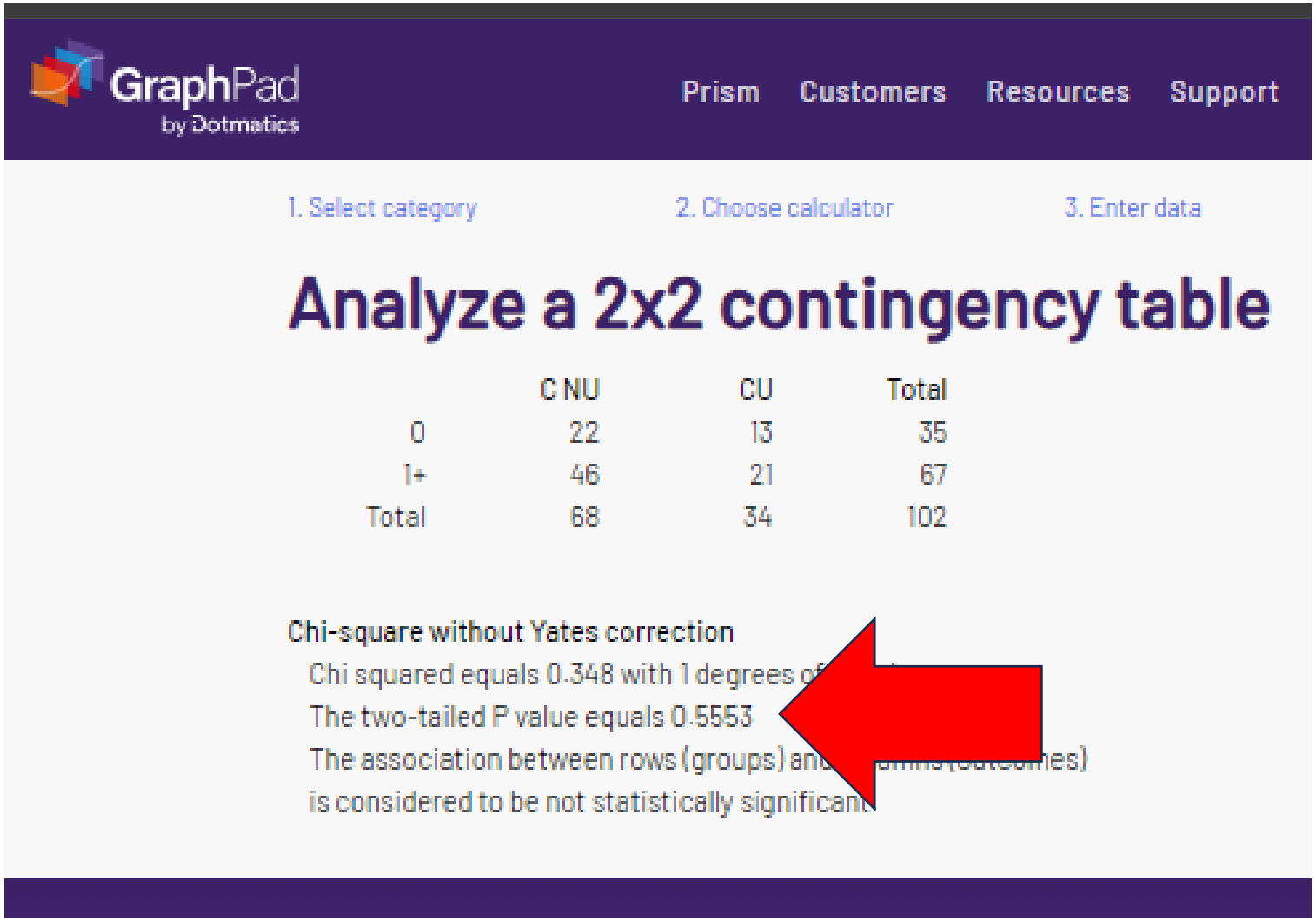
Chi squared equals 0.849 with 1 degrees of freedom.
The two-tailed P value equals 0.3568
The association between rows (groups) and columns (outcomes)
is considered to be not statistically significant.

The p-value can be repeated with the **wrong** statistic.

Note that the N per cell is >= 10 so chi-square with Yates is **not** the appropriate statistic to run here.

C. “corrected” chi-sq or Fishers p = .7124





The 1+ is calculated as sum of 1 and 2+ groups

C. “corrected” chi-sq or Fishers p = .7124

Analyze a 2x2 contingency t

Contingency tables are used to analyze counts of subjects to determin
calculator is for 2x2 contingency tables that separate each subject int
two possibilities. Simply label the rows and columns, then type in the c
two factors. Learn more about contingency tables (along with when to

Enter your data

Enter the labels and number of subjects actually observed. Don't e

	C NU	CU
0	22	13
1+	46	21

Which test

- (●) Fisher's exact test
- ( ) Chi-square
- ( ) Chi-square with Yates' correction

P value Tails

- (●) Two-tailed (recommended)
- ( ) One-tailed

Calculate | Clear The Form

matics

1. Select category 2. Choose calculator 3. Enter data

Analyze a 2x2 contingency table

	C NU	CU	Total
0	22	13	35
1+	46	21	67
Total	68	34	102

Fisher's exact test

The two-tailed P value equals 0.6590

The association between rows (groups) a olumns (outcomes)

is considered to be not statistically significant.

The Chronic Diseases / patient (0 vs 1+) could not be verified with chi-square or Fisher’s.

C. “corrected” chi-sq or Fishers p = .7124

Analyze a 2x2 contingency

Contingency tables are used to analyze counts of subjects to deterr
calculator is for 2x2 contingency tables that separate each subject i
two possibilities. Simply label the rows and columns, then type in th
two factors. Learn more about contingency tables (along with when

Enter your data

Enter the labels and number of subjects actually observed. Don't

	C NU	CU
0	22	13
1+	46	21

Which test

- ○ Fisher's exact test
- ○ Chi-square
- ● Chi-square with Yates' correction

P value Tails

- ● Two-tailed (recommended)
- ○ One-tailed

Calculate | Clear The Form

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GraphPad by Dotmatics — Prism | Customers | Resources

1. Select category | 2. Choose calculator | 3. Ent

Analyze a 2x2 contingency t

	C NU	CU	Total
0	22	13	35
1+	46	21	67
Total	68	34	102

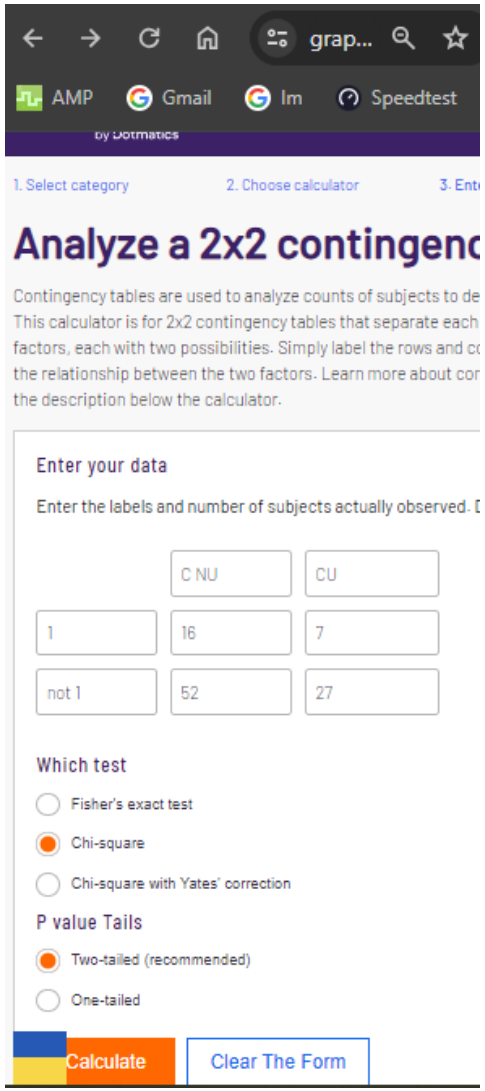
Chi-square with Yates correction

Chi squared equals 0.136 with 1 degrees of freedom.
The two-tailed P value equals 0.7124
The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.

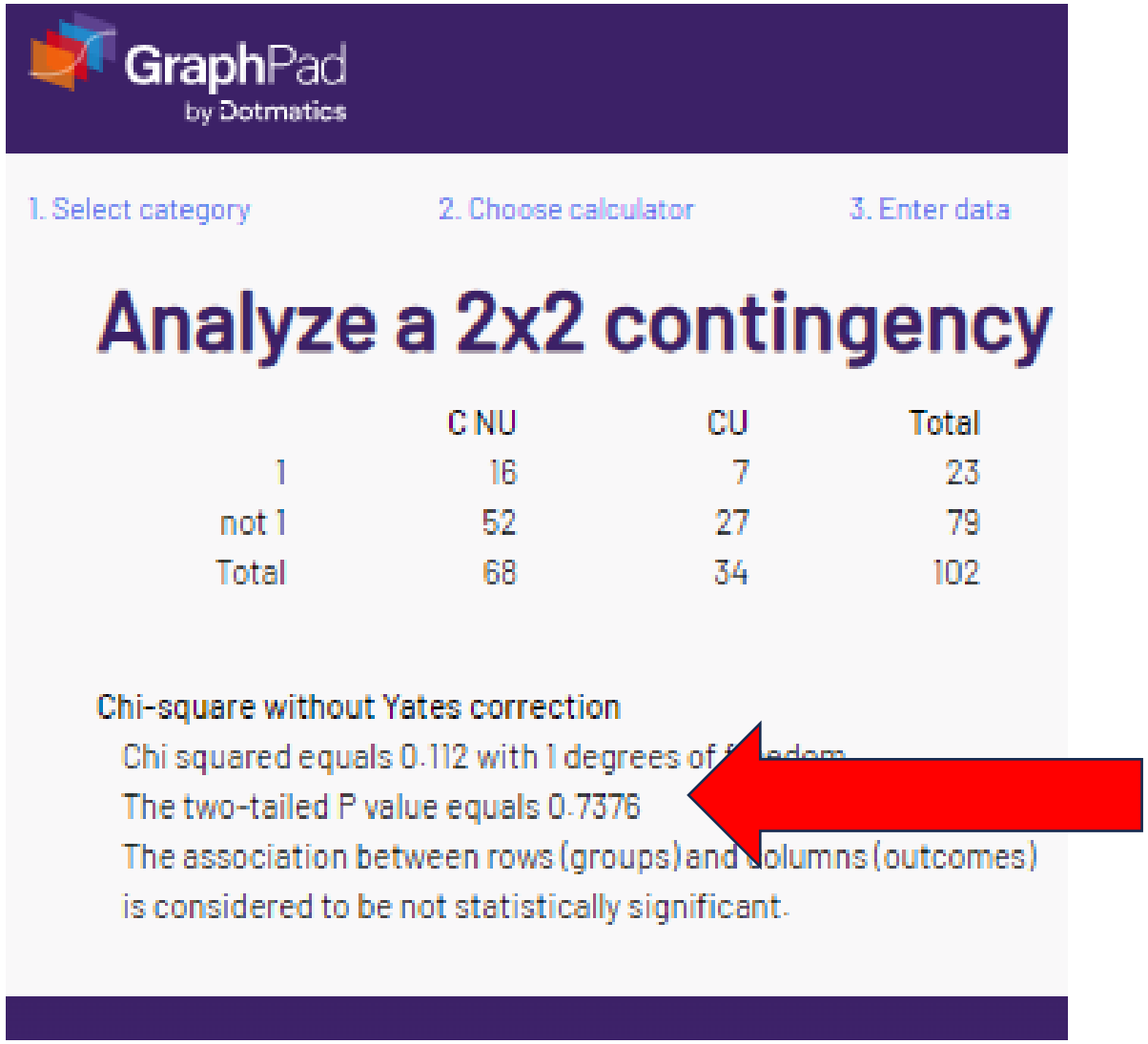
The Chronic Diseases / patient (0 vs 1+) does correspond with that of the wrong statistic.

Note that N per cell > 20 so Yates is **inappropriate** and should **not** be reported here.

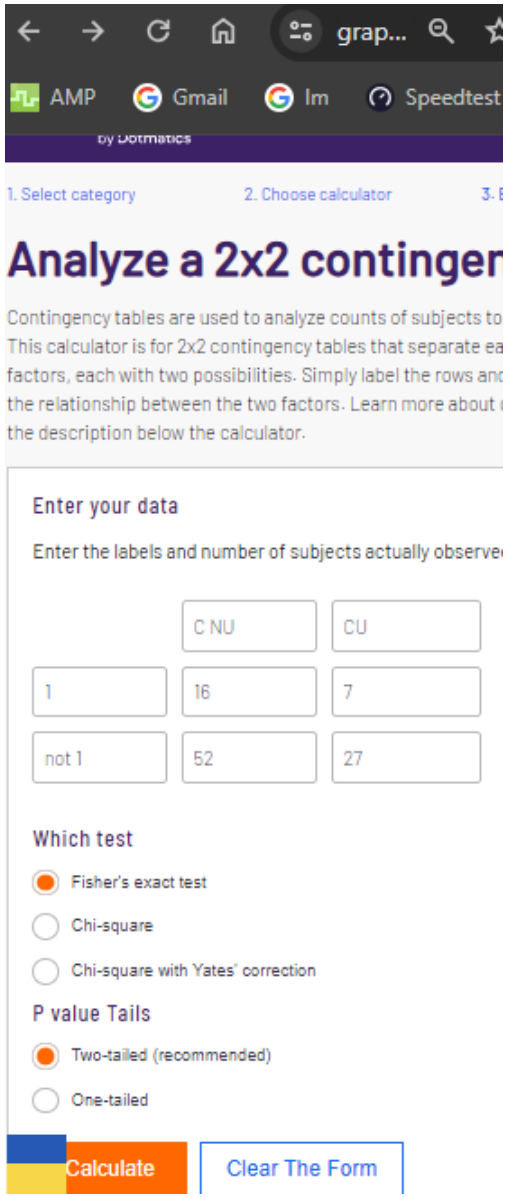
D. “corrected” chi-sq or Fishers p = .9332

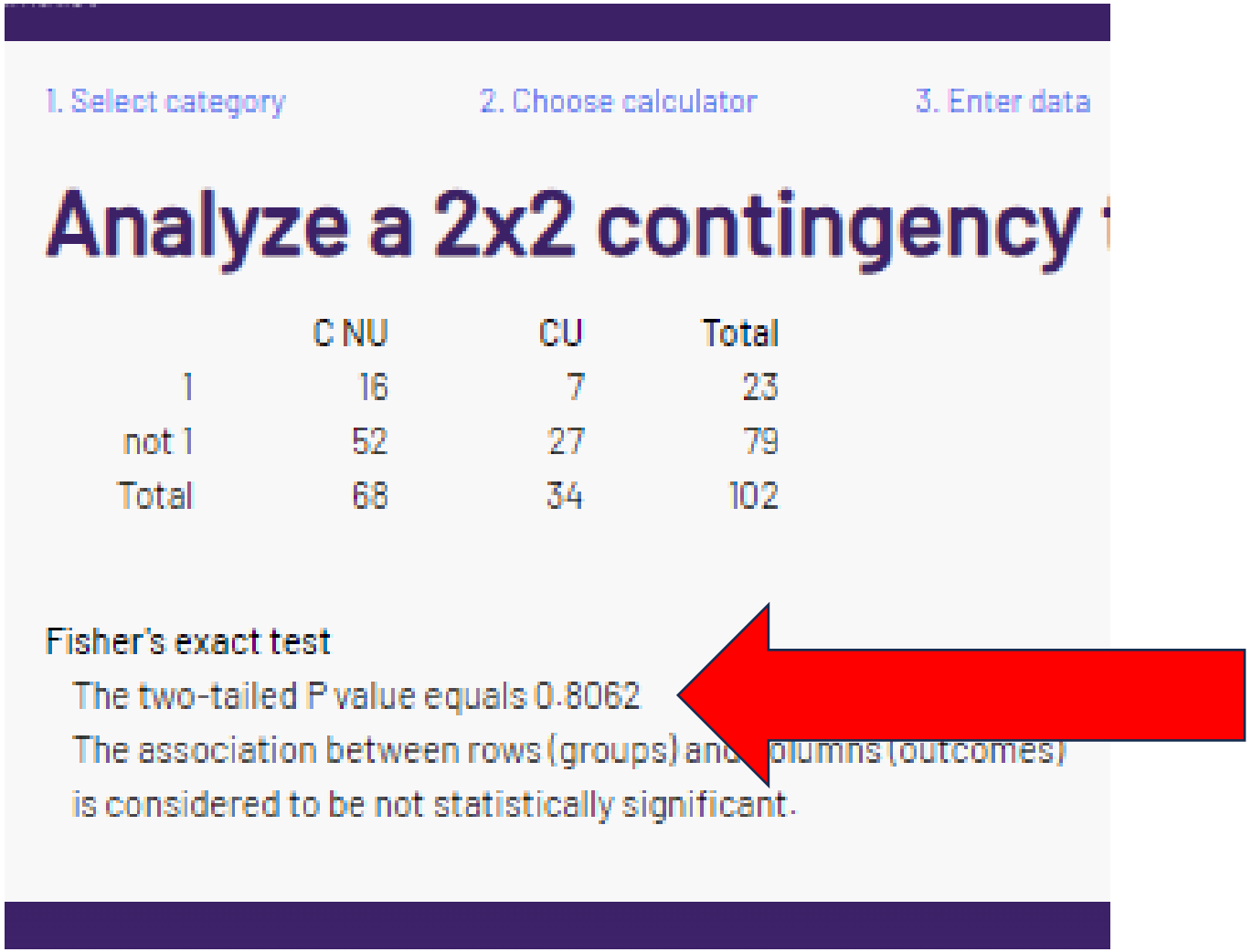


‘Not 1’ calculated as sum of 0 and 2+



D. “corrected” chi-sq or Fishers p = .9332





P value for chronic diseases = 1 **not verified** with chi-square or Fisher’s.

D. “corrected” chi-sq or Fishers p = .9332

Analyze a 2x2 continger

Contingency tables are used to analyze counts of subjects tc
factors. This calculator is for 2x2 contingency tables that se
on two factors, each with two possibilities. Simply label the r
cell to test the relationship between the two factors. Learn r
use each test) in the description below the calculator.

Enter your data

Enter the labels and number of subjects actually observe
means.

	C NU	CU
1	16	7
not 1	52	27

Which test

- Fisher's exact test
- Chi-square
- Chi-square with Yates' correction

P value Tails

- Two-tailed (recommended)
- One-tailed

Analyze a 2x2 contingency ta

	C NU	CU	Total
1	16	7	23
not 1	52	27	79
Total	68	34	102

Chi-square with Yates correction

Chi squared equals 0.007 with 1 degrees of freedom.

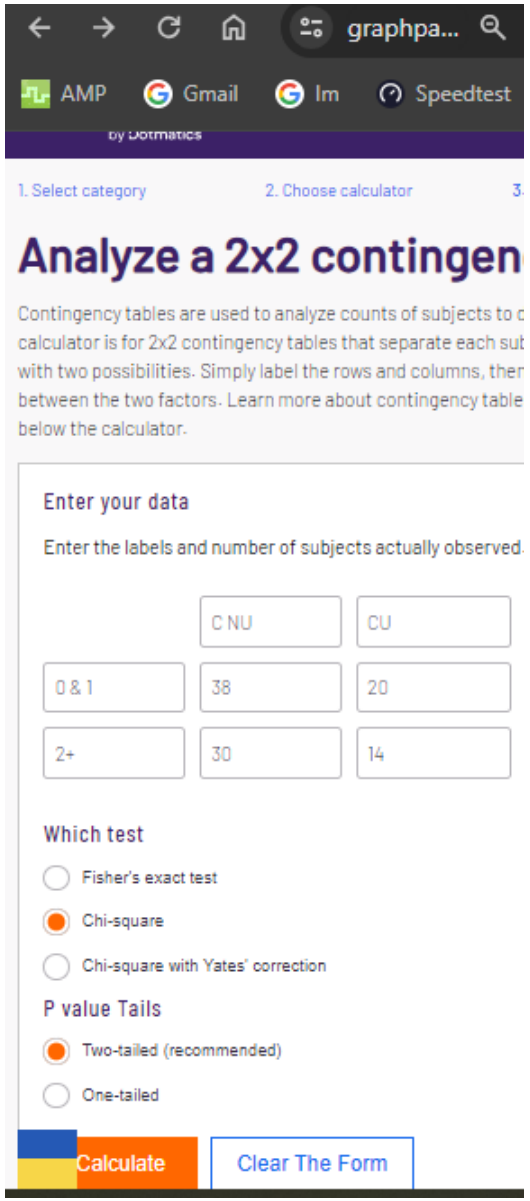
The two-tailed P value equals 0.9332

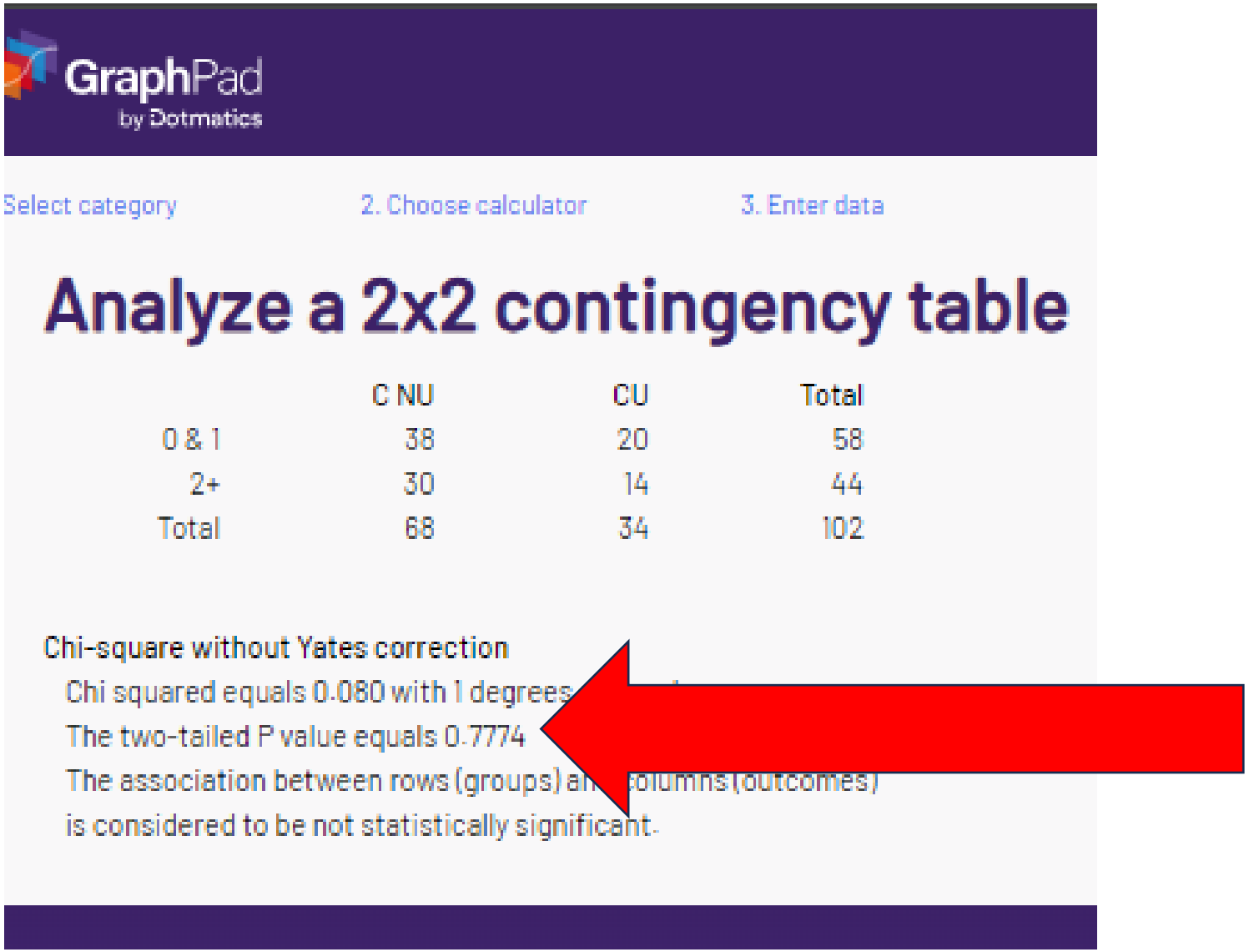
The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.

P value for chronic diseases = 1 can be reproduced but only using an **inappropriate statistic** (not in methods).

Note that N per cell is > 5 so Yates is the wrong statistic according to the Wikipedia criteria.
It could be applied according to BMJ guidance (although, again, only if specified in the methods).

E. “corrected” chi-sq or Fishers p = .9437





E. “corrected” chi-sq or Fishers p = .9437

Analyze a 2x2 contingenc

Contingency tables are used to analyze counts of subjects to de
calculator is for 2x2 contingency tables that separate each subje
with two possibilities. Simply label the rows and columns, then t
between the two factors. Learn more about contingency tables (
below the calculator.

Enter your data

Enter the labels and number of subjects actually observed. D

	C NU	CU
0 & 1	38	20
2+	30	14

Which test

- (●) Fisher's exact test
- ( ) Chi-square
- ( ) Chi-square with Yates' correction

P value Tails

- (●) Two-tailed (recommended)
- ( ) One-tailed

Calculate | Clear The Form

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1. Select category 2. Choose calculator 3. Enter data

Analyze a 2x2 contingency table

	C NU	CU	Total
0 & 1	38	20	58
2+	30	14	44
Total	68	34	102

Fisher's exact test

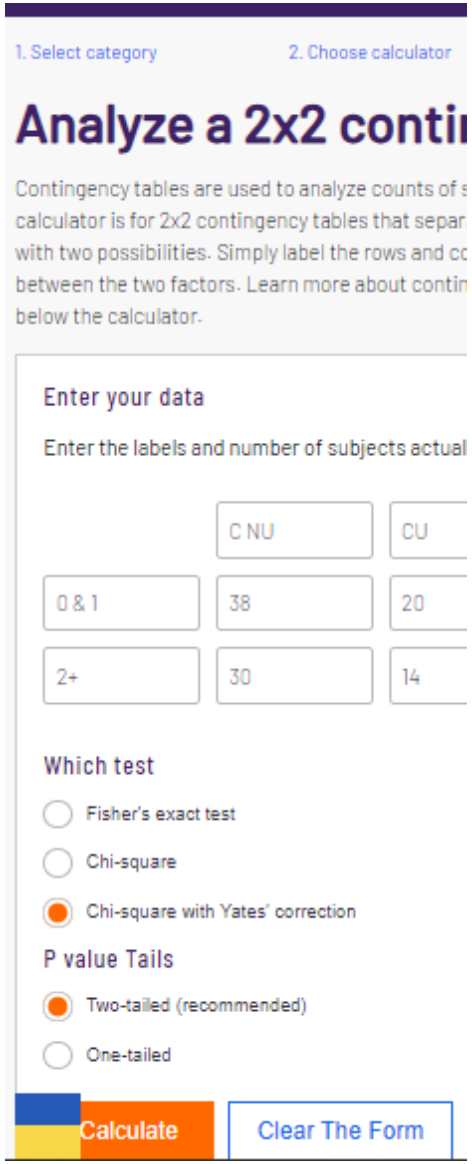
The two-tailed P value equals 0.8341

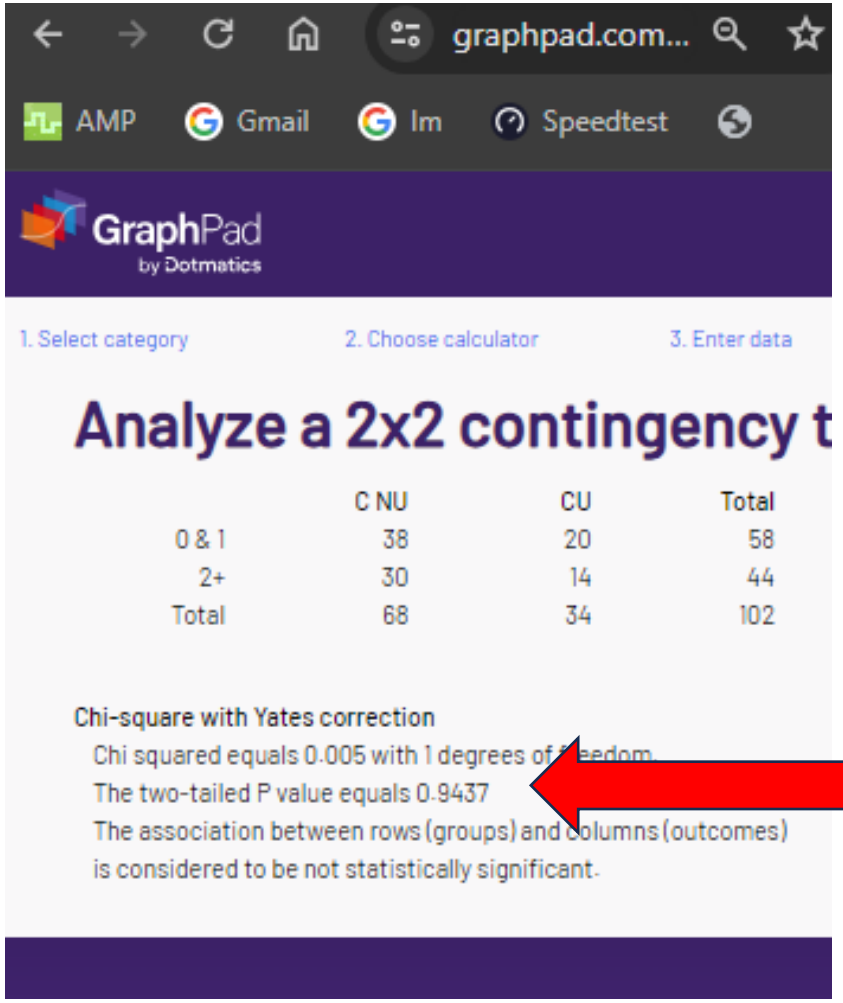
The association between rows (groups) a columns (outcomes)

is considered to be not statistically significant.

For chronic diseases 2+, the “corrected” statistics (chi-sq or Fisher’s) could **not** be verified.

E. “corrected” chi-sq or Fishers p = .9437





Note large N.

For chronic diseases 2+, the p value could be reproduced but only with an Inappropriate statistic.

As the N per cell is large (>13), Yates is an inappropriate statistic and should not be reported.

F. “corrected” chi-sq or Fishers p = .2762

Analyze a 2x2 contingenc

Contingency tables are used to analyze counts of subjects to det
calculator is for 2x2 contingency tables that separate each subje
with two possibilities. Simply label the rows and columns, then ty
between the two factors. Learn more about contingency tables (a
below the calculator.

Enter your data

Enter the labels and number of subjects actually observed. D

	C NU	CU
CHD+	18	5
2+	50	29

Which test

- ○ Fisher's exact test
- ● Chi-square
- ○ Chi-square with Yates' correction

P value Tails

- ● Two-tailed (recommended)
- ○ One-tailed

Calculate | Clear The Form

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1. Select category 2. Choose calculator 3. Enter data

Analyze a 2x2 contingency table

	C NU	CU	Total
CHD+	18	5	23
2+	50	29	79
Total	68	34	102

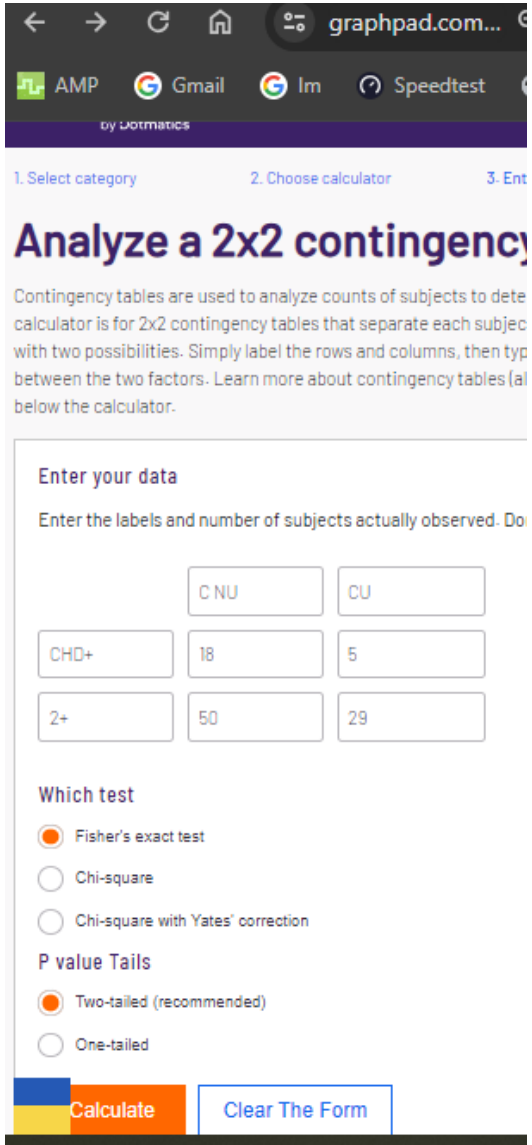
Chi-square without Yates correction

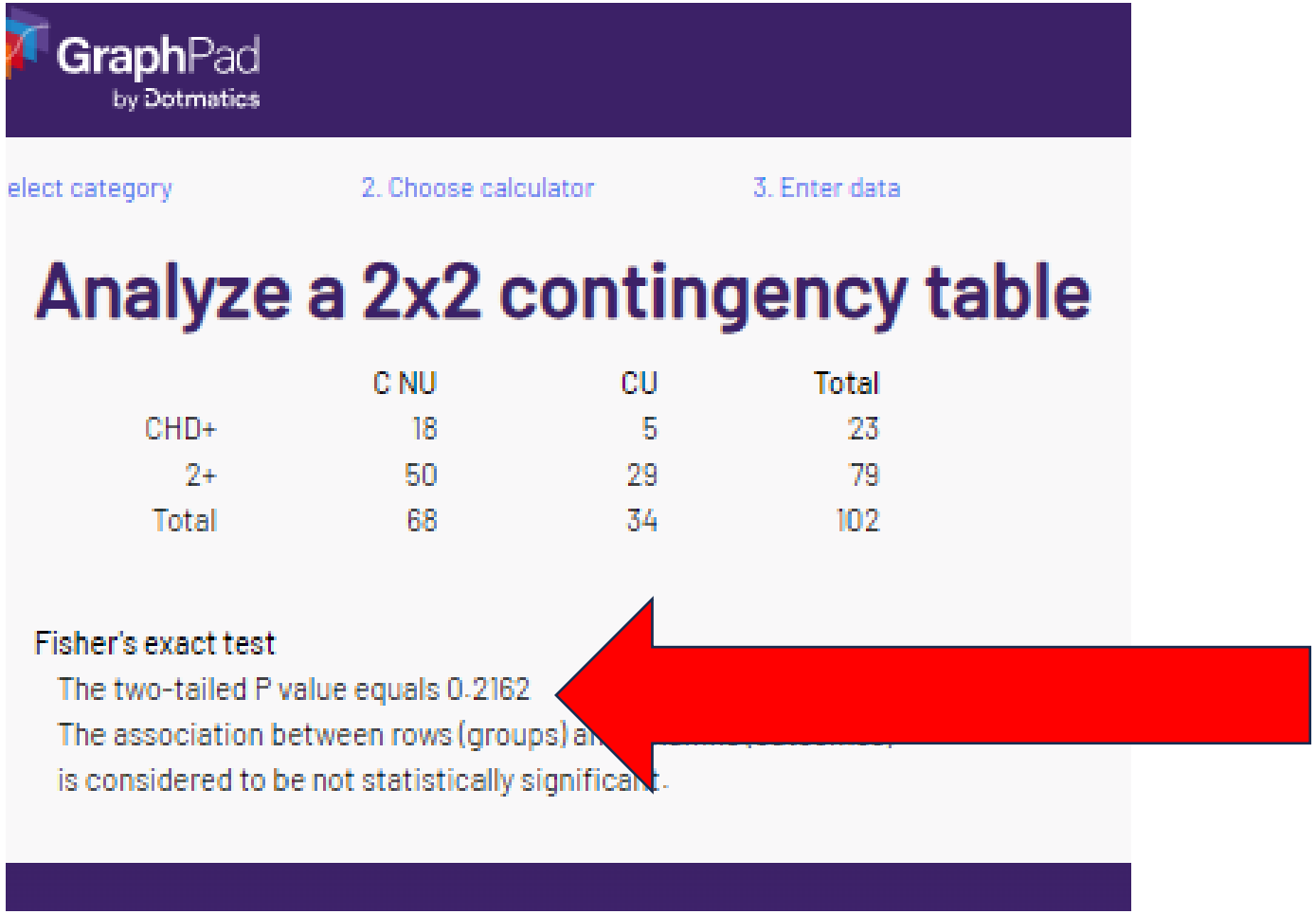
Chi squared equals 1.796 with 1 degrees of f

The two-tailed P value equals 0.1802

The association between rows (groups) and c umns (outcomes) is considered to be not statistically significant.

F. “corrected” chi-sq or Fishers p = .2762





The reported “corrected” p value could not be verified with chi-square or Fisher’s.

F. “corrected” chi-sq or Fishers p = .2762

Analyze a 2x2 contingency

Contingency tables are used to analyze counts of subjects to determi
calculator is for 2x2 contingency tables that separate each subject in
two possibilities. Simply label the rows and columns, then type in the
two factors. Learn more about contingency tables (along with when t

Enter your data

Enter the labels and number of subjects actually observed. Don't e

	C NU	CU
CHD+	18	5
2+	50	29

Which test

- ○ Fisher's exact test
- ○ Chi-square
- ● Chi-square with Yates' correction

P value Tails

- ● Two-tailed (recommended)
- ○ One-tailed

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en.wikipedia.org/wiki/Yates's_correction_for_continuity

AMP | Gmail | Im | Speedtest | Canvas2 | CHR-Datasets | Altmetric it! | G-Email | All Bookm | Error

son's chi-squared test by subtracting 0.5 from the difference between each observed value and its expected value in a 2 × 2 ngency table.[1] This reduces the chi-squared value obtained and thus increases its p-value.

The effect of Yates's correction is to prevent overestimation of statistical significance for small data. This formula is chiefly used when at least one cell of the table has an expected count smaller than 5. Unfortunately, Yates's correction may tend to overcorrect. This can result in an overly conservative result that fails to reject the null hypothesis when it should (a type II error). So it is suggested that Yates's correction is unnecessary even with quite low sample sizes,[2] such as:

According to Wikipedia (above), an N < 5 might warrant Yates correction. However, as the smallest cell observed = 5, it would not be warranted here according to the Wiki convention. It could be used (when in methods) according to the BMJ Guidance.

Analyze a 2x2 contingency table

	C NU	CU	Total
CHD+	18	5	23
2+	50	29	79
Total	68	34	102

Chi-square with Yates correction

Chi squared equals 1.186 with 1 degrees of fre om.

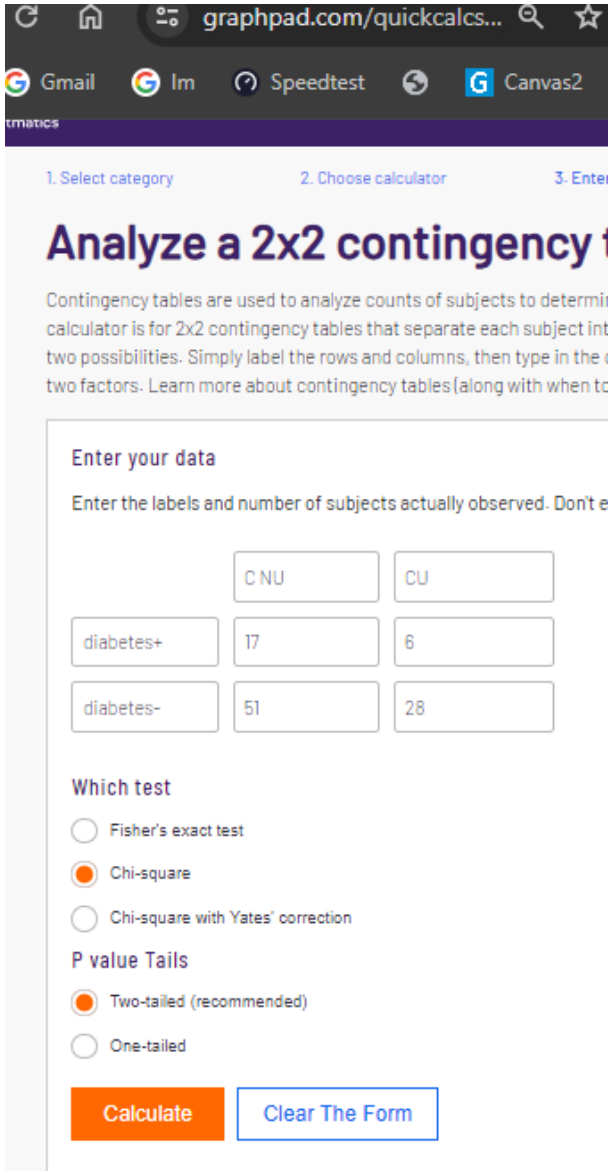
The two-tailed P value equals 0.2762

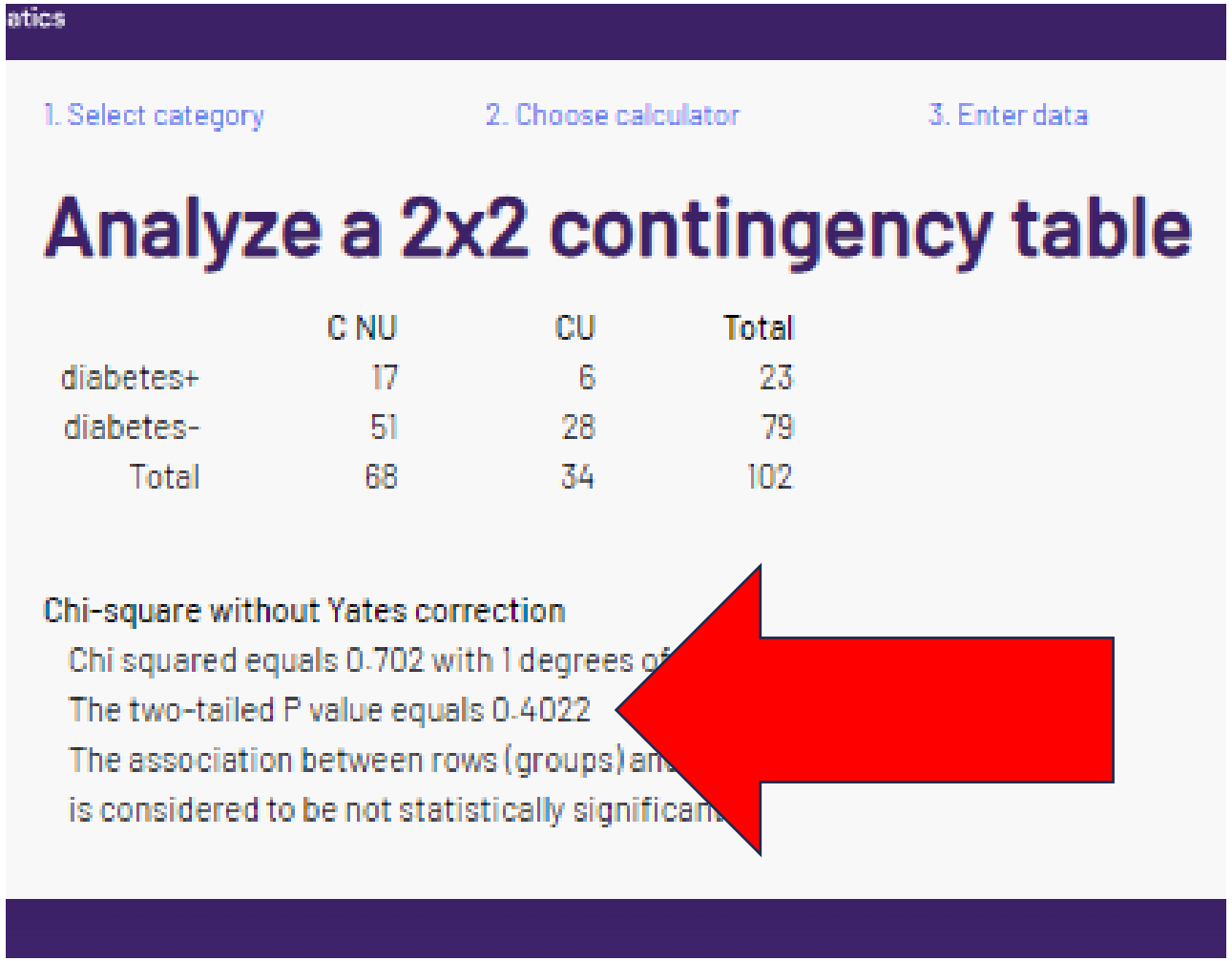
The association between rows (groups) and

is considered to be not statistically significant

P value is reproduced but with (arguably) the wrong statistic (not in methods section too).

G. “corrected” chi-sq or Fishers p = .5576





G. “corrected” chi-sq or Fisher’s p = .5576

Analyze a 2x2 contingency

Contingency tables are used to analyze counts of subjects to dete
calculator is for 2x2 contingency tables that separate each subjec
two possibilities. Simply label the rows and columns, then type in t
two factors. Learn more about contingency tables (along with whe

Enter your data

Enter the labels and number of subjects actually observed. Do

	C NU	CU
diabetes+	17	6
diabetes-	51	28

Which test

- (●) Fisher's exact test
- ( ) Chi-square
- ( ) Chi-square with Yates' correction

P value Tails

- (●) Two-tailed (recommended)
- ( ) One-tailed

Calculate | Clear The Form

1. Select category 2. Choose calculator 3. Enter data

Analyze a 2x2 contingency table

	C NU	CU	Total
diabetes+	17	6	23
diabetes-	51	28	79
Total	68	34	102

Fisher's exact test

The two-tailed P value equals 0.4606

The association between rows (groups) and c

is considered to be not statistically significant.

The “corrected” p value is not reproduced for chi-square or Fisher’s for diabetes.

G. “corrected” chi-sq or Fishers p = .5576

Analyze a 2x2 contingency

Contingency tables are used to analyze counts of subjects to deterr
calculator is for 2x2 contingency tables that separate each subject
two possibilities. Simply label the rows and columns, then type in th
two factors. Learn more about contingency tables (along with when

Enter your data

Enter the labels and number of subjects actually observed. Don'

	C NU	CU
diabetes+	17	6
diabetes-	51	28

Which test

- ○ Fisher's exact test
- ○ Chi-square
- ● Chi-square with Yates' correction

P value Tails

- ● Two-tailed (recommended)
- ○ One-tailed

Calculate | Clear The Form

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1. Select category 2. Choose calculator 3. Enter data

Analyze a 2x2 contingency table

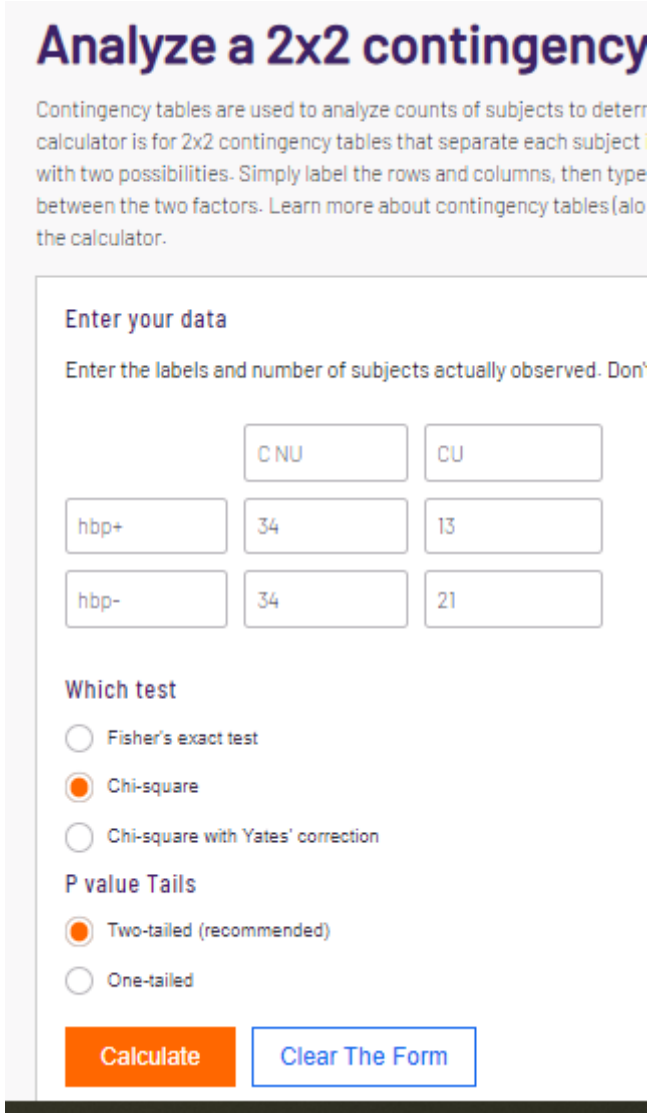
	C NU	CU	Total
diabetes+	17	6	23
diabetes-	51	28	79
Total	68	34	102

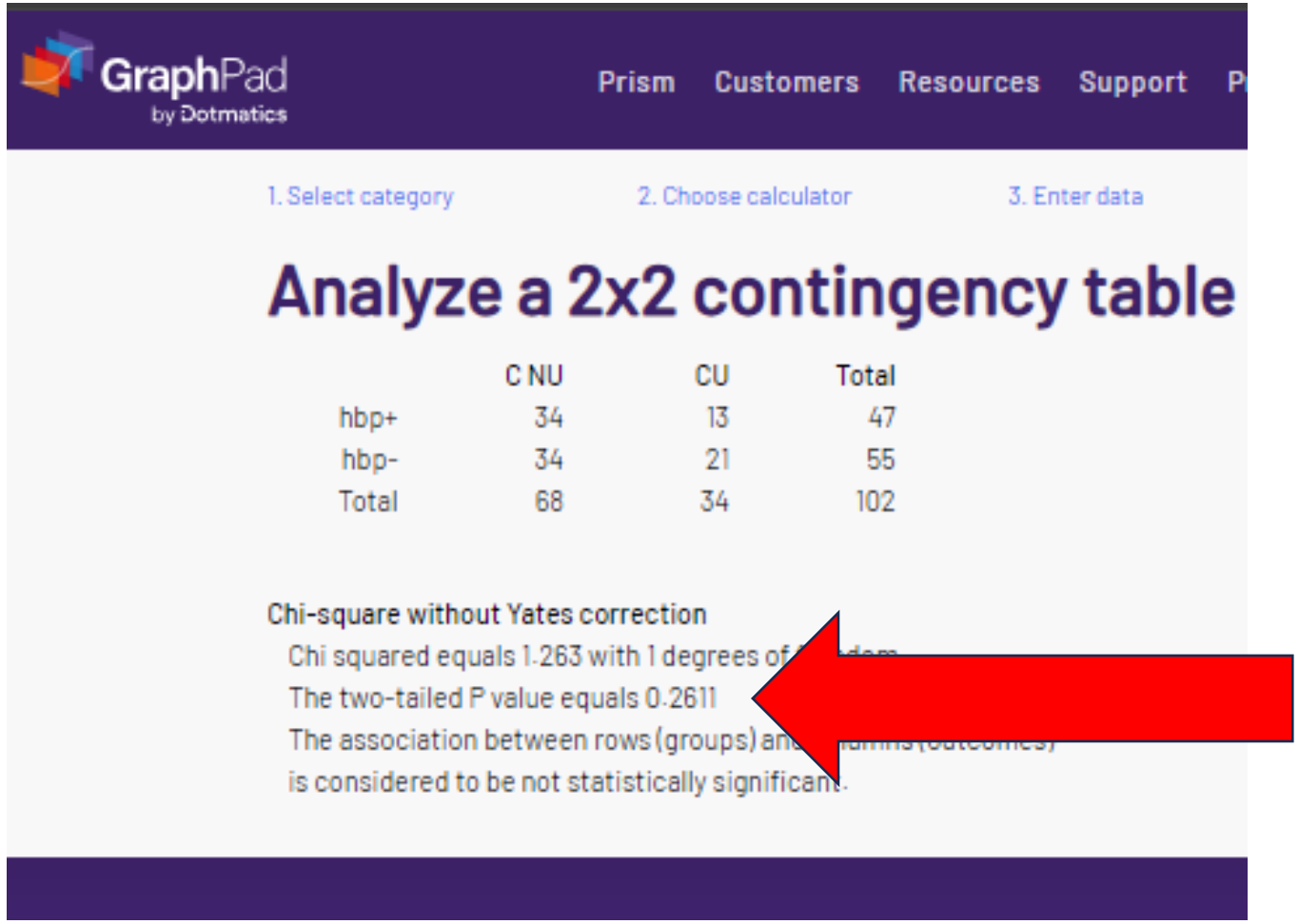
Chi-square with Yates correction

Chi squared equals 0.344 with 1 degrees of freedom.
The two-tailed P value equals 0.5576
The association between rows (groups) and columns (outcomes)
is considered to be not statistically significant.

The smallest cell = 6 so Yates is **not** appropriate (Wikipedia convention).
The p values is reproduced with an incorrect statistic (not in methods).

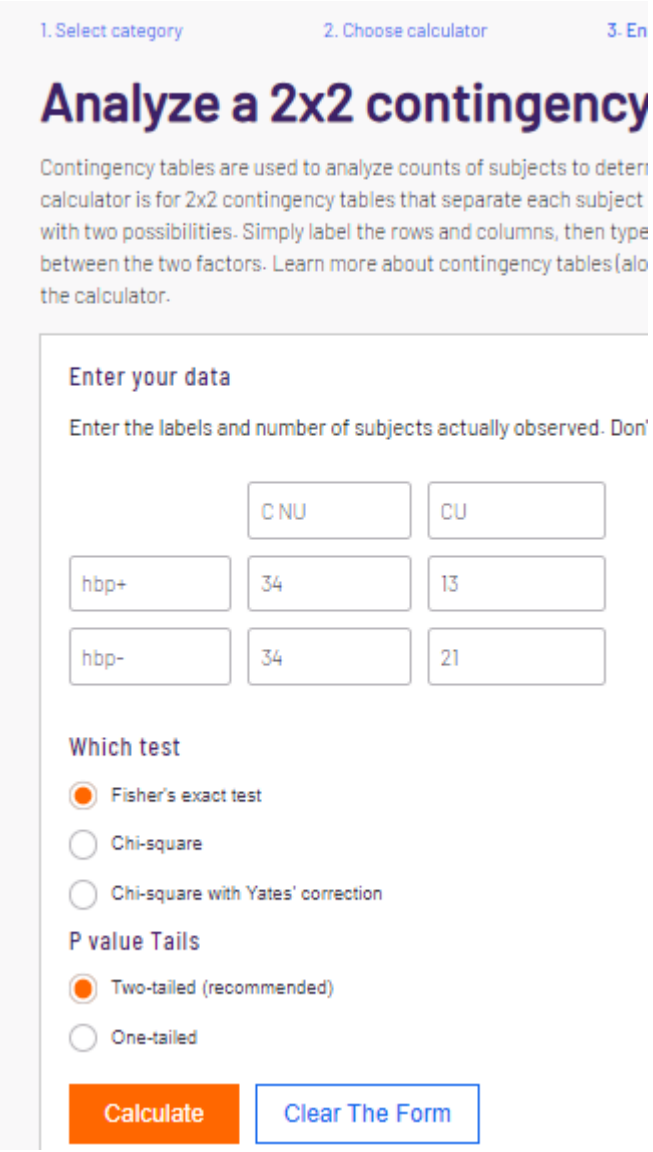
H. “corrected” chi-sq or Fishers p = .3612

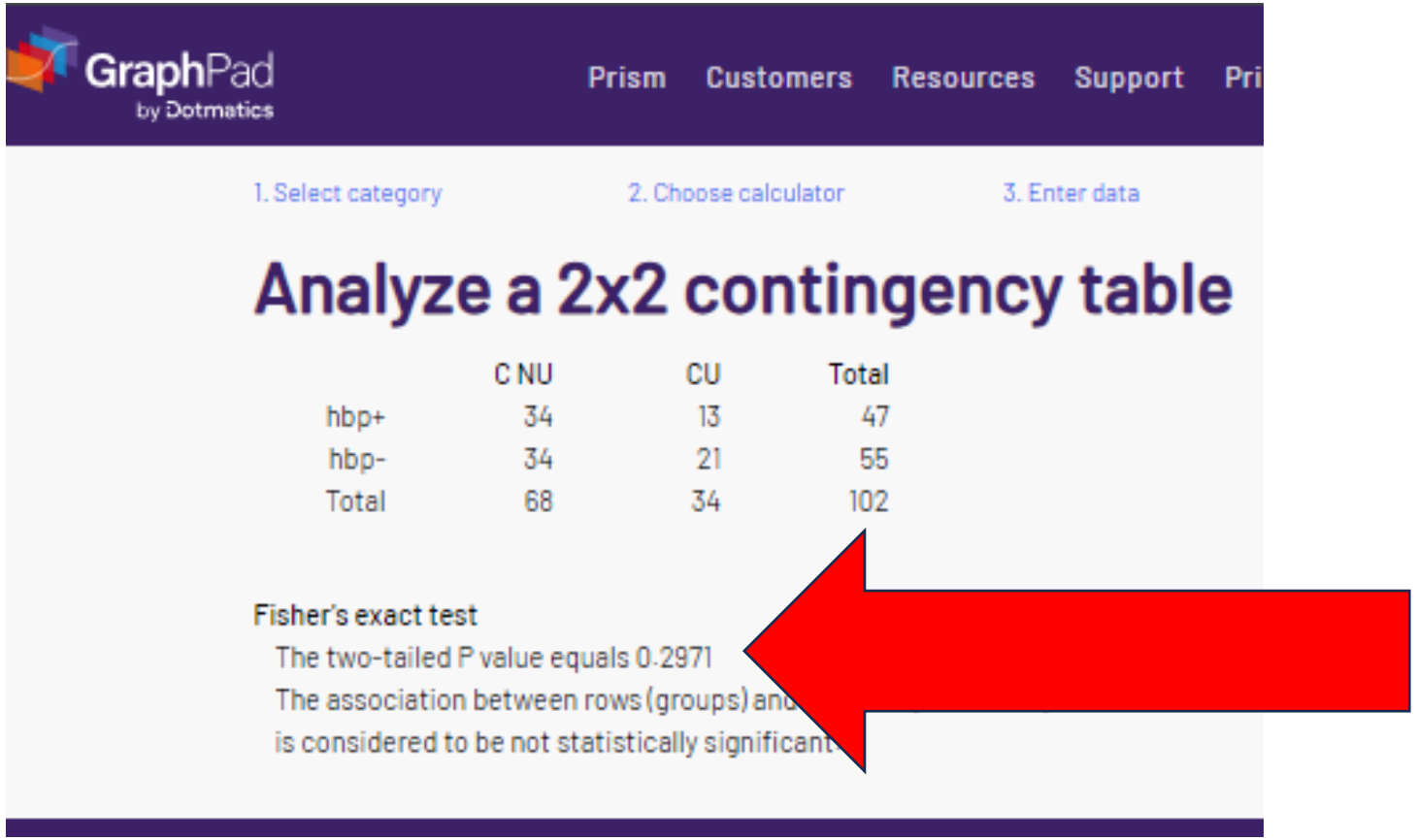




Note large (>12) N per cell.

H. “corrected” chi-sq or Fishers p = .3612





The analysis is **not** verified for chi-square or Fisher’s for high blood pressure.

H. “corrected” chi-sq or Fishers p = .3612

Analyze a 2x2 contingency

Contingency tables are used to analyze counts of subjects to determ
calculator is for 2x2 contingency tables that separate each subject i
with two possibilities. Simply label the rows and columns, then type
between the two factors. Learn more about contingency tables (alor
the calculator.

Enter your data

Enter the labels and number of subjects actually observed. Don't

	C NU	CU
hbp+	34	13
hbp-	34	21

Which test

- Fisher's exact test
- Chi-square
- Chi-square with Yates' correction

P value Tails

- Two-tailed (recommended)
- One-tailed

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tmatics

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1. Select category | 2. Choose calculator | 3. Enter data

Analyze a 2x2 contingency table

	C NU	CU	Total
hbp+	34	13	47
hbp-	34	21	55
Total	68	34	102

Chi-square with Yates correction

Chi squared equals 0.834 with 1 degrees of freedom

The two-tailed P value equals 0.3612

The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.

The smallest hypertension cell = 13 so there was **no reason** to run Yates. However, the p value was reproduced (with an incorrect statistic).

I. “corrected” chi-sq or Fishers p = “1”

1. Select category 2. Choose calculator 3. En

Analyze a 2x2 contingency

Contingency tables are used to analyze counts of subjects to deterr calculator is for 2x2 contingency tables that separate each subject with two possibilities. Simply label the rows and columns, then type between the two factors. Learn more about contingency tables (alo the calculator.

Enter your data

Enter the labels and number of subjects actually observed. Don'

	C NU	CU
COPD+	9	3
COPD-	59	31

Which test

- Fisher's exact test
- Chi-square
- Chi-square with Yates' correction

P value Tails

- Two-tailed (recommended)
- One-tailed

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1. Select category 2. Choose calculator 3. Enter data

Analyze a 2x2 contingency table

	C NU	CU	Total
COPD+	9	3	12
COPD-	59	31	90
Total	68	34	102

Chi-square without Yates correction

Chi squared equals 0.425 with 1 degrees of

The two-tailed P value equals 0.5145

The association between rows (groups) an

is considered to be not statistically significant.

I. “corrected” chi-sq or Fishers p = “1”

1. Select category 2. Choose calculator 3. Er

Analyze a 2x2 contingency

Contingency tables are used to analyze counts of subjects to deter
calculator is for 2x2 contingency tables that separate each subject
with two possibilities. Simply label the rows and columns, then typ
between the two factors. Learn more about contingency tables (al
the calculator.

Enter your data

Enter the labels and number of subjects actually observed. Dor

	C NU	CU
COPD+	9	3
COPD-	59	31

Which test

- (●) Fisher's exact test
- ( ) Chi-square
- ( ) Chi-square with Yates' correction

P value Tails

- (●) Two-tailed (recommended)
- ( ) One-tailed

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1. Select category 2. Choose calculator 3. Enter data

Analyze a 2x2 contingency table

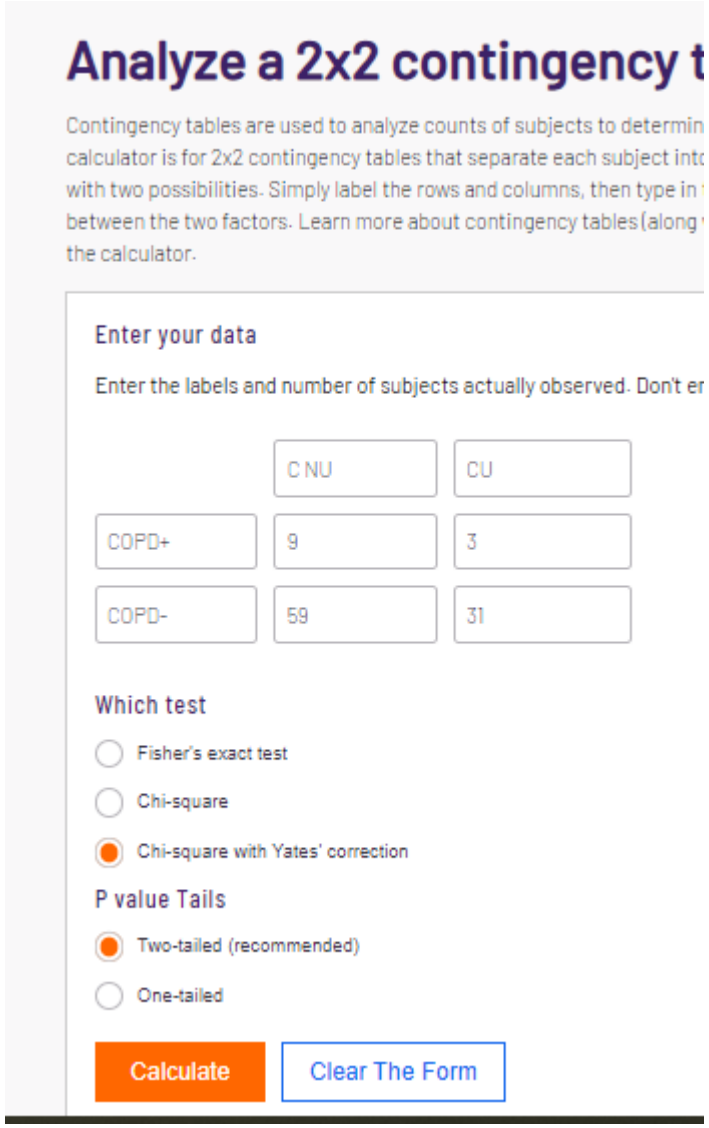
	C NU	CU	Total
COPD+	9	3	12
COPD-	59	31	90
Total	68	34	102

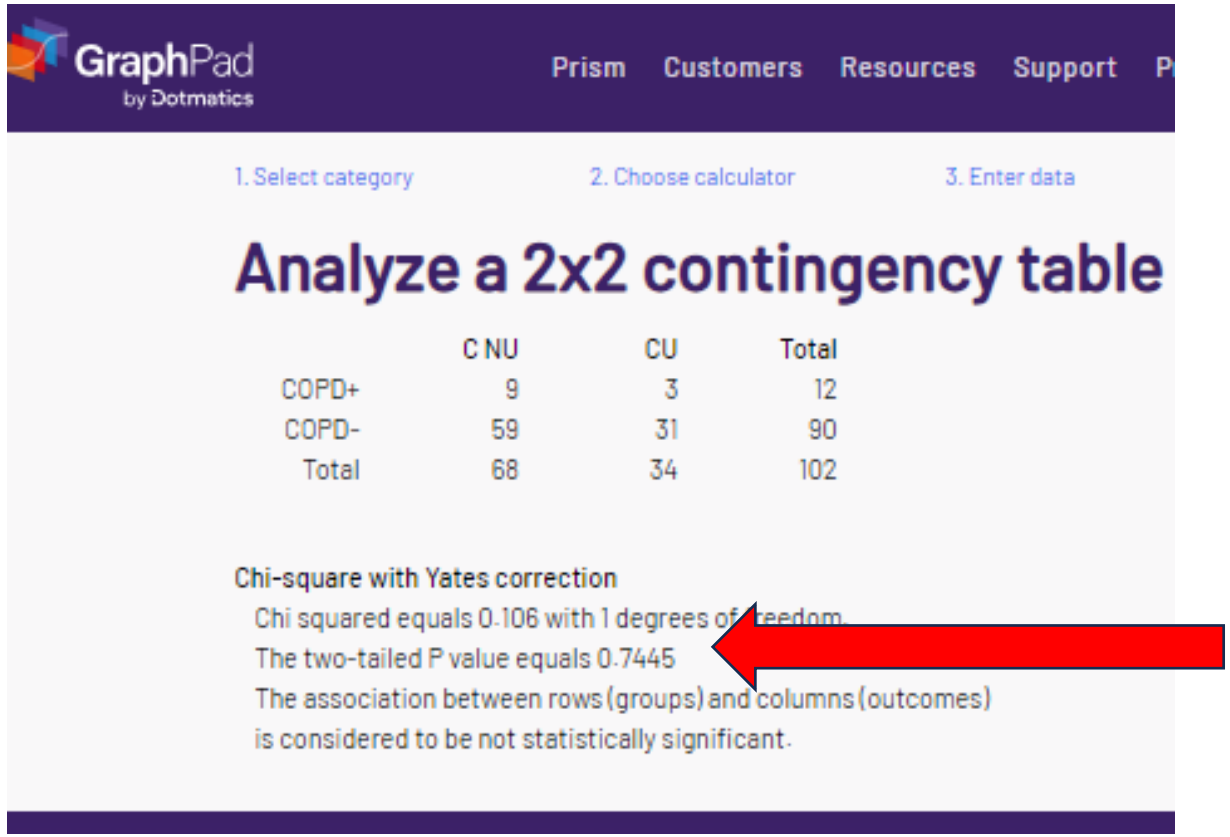
Fisher's exact test

The two-tailed P value equals 0.7463

The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.

I. “corrected” chi-sq or Fishers p = “1”





The reported p value for COPD was **not verified** with either chi-square, Fisher’s, or Yates. Note that for the small (< 5) values per cell, many statisticians would argue that Yates would be an **appropriate** analysis here. For p to = 1.000, the proportion would have to be identical in both groups. If 9 per total 68 in Cannabis Non Users, then 4.5 per 34 in Cannabis Users. Obviously, this is an impossible N so there is some error in reporting.

J. “corrected” chi-sq or Fishers p = .2491

Analyze a 2x2 contingen

Contingency tables are used to analyze counts of subjects t
factors. This calculator is for 2x2 contingency tables that se
on two factors, each with two possibilities. Simply label the
cell to test the relationship between the two factors. Learn
use each test) in the description below the calculator.

Enter your data

Enter the labels and number of subjects actually observe

	C NU	CU
hyperlip +	23	7
hyperlip -	45	27

Which test

- ○ Fisher's exact test
- ● Chi-square
- ○ Chi-square with Yates' correction

P value Tails

- ● Two-tailed (recommended)
- ○ One-tailed

Calculate | Clear The Form

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elect category | 2. Choose calculator | 3. Enter data | 4. Vi

Analyze a 2x2 contingency table

	C NU	CU	Total
hyperlip +	23	7	30
hyperlip -	45	27	72
Total	68	34	102

Chi-square without Yates correction

Chi squared equals 1.913 with 1 degrees of freedom.

The two-tailed P value equals 0.1667

The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.

J. “corrected” chi-sq or Fishers p = .2491

Analyze a 2x2 contingency table

Contingency tables are used to analyze counts of subjects to determine if there is a
factors. This calculator is for 2x2 contingency tables that separate each subject int
on two factors, each with two possibilities. Simply label the rows and columns, then
cell to test the relationship between the two factors. Learn more about contingency
use each test) in the description below the calculator.

Enter your data

Enter the labels and number of subjects actually observed. Don't enter proportic

	C NU	CU
hyperlip +	23	7
hyperlip -	45	27

Which test

- (●) Fisher's exact test
- ( ) Chi-square
- ( ) Chi-square with Yates' correction

P value Tails

- (●) Two-tailed (recommended)
- ( ) One-tailed

Calculate | Clear The Form

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1. Select category 2. Choose calculator 3. Enter data 4. V

Analyze a 2x2 contingency table

	C NU	CU	Total
hyperlip +	23	7	30
hyperlip -	45	27	72
Total	68	34	102

Fisher's exact test

The two-tailed P value equals 0.2488

The association between rows (groups) a

is considered to be not statistically significant.

J. “corrected” chi-sq or Fisher’s p = .2491

Analyze a 2x2 contingenc

Contingency tables are used to analyze counts of subjects to dete
factors. This calculator is for 2x2 contingency tables that separat
on two factors, each with two possibilities. Simply label the rows
cell to test the relationship between the two factors. Learn more
use each test) in the description below the calculator.

Enter your data

Enter the labels and number of subjects actually observed. Dc

	C NU	CU
hyperlip +	23	7
hyperlip -	45	27

Which test

- ○ Fisher’s exact test
- ○ Chi-square
- ● Chi-square with Yates’ correction

P value Tails

- ● Two-tailed (recommended)
- ○ One-tailed

Calculate | Clear The Form

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1. Select category 2. Choose calculator 3. Enter data 4. V

Analyze a 2x2 contingency table

	C NU	CU	Total
hyperlip +	23	7	30
hyperlip -	45	27	72
Total	68	34	102

Chi-square with Yates correction

Chi squared equals 1.328 with 1 degrees of freedom.
The two-tailed P value equals 0.2491
The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.

The smallest cell = 7 so Yates would not be appropriate for hyperlipidemia (Wiki criteria). However, the p value was reproduced (albeit with the wrong-not in methods, statistic).

K. “corrected” chi-sq or Fisher’s p = “1”

Analyze a 2x2 contingency table

Contingency tables are used to analyze counts of subjects to determine if there is as
factors. This calculator is for 2x2 contingency tables that separate each subject into
on two factors, each with two possibilities. Simply label the rows and columns, then t
cell to test the relationship between the two factors. Learn more about contingency
use each test) in the description below the calculator.

Enter your data

Enter the labels and number of subjects actually observed. Don't enter proportior

	C NU	CU
other bd+	2	0
other bd-	66	34

Which test

- ○ Fisher's exact test
- ● Chi-square
- ○ Chi-square with Yates' correction

P value Tails

- ● Two-tailed (recommended)
- ○ One-tailed

Calculate | Clear The Form

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1. Select category 2. Choose calculator 3. Enter data 4. Vi

Analyze a 2x2 contingency table

	C NU	CU	Total
other bd+	2	0	2
other bd-	66	34	100
Total	68	34	102

Chi-square without Yates correction

Chi squared equals 1.020 with 1 degrees of freedom.

The two-tailed P value equals 0.3125

The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.

K. “corrected” chi-sq or Fisher’s p = “1”

Analyze a 2x2 contingen

Contingency tables are used to analyze counts of subjects to
factors. This calculator is for 2x2 contingency tables that se
on two factors, each with two possibilities. Simply label the
cell to test the relationship between the two factors. Learn
use each test) in the description below the calculator.

Enter your data

Enter the labels and number of subjects actually observe

	C NU	CU
other bd+	2	0
other bd-	66	34

Which test

- (●) Fisher's exact test
- ( ) Chi-square
- ( ) Chi-square with Yates' correction

P value Tails

- (●) Two-tailed (recommended)
- ( ) One-tailed

Calculate | Clear The Form

GraphPad by Dotmatics

1. Select category 2. Choose calculator 3. Enter data 4. Vie

Analyze a 2x2 contingency table

	C NU	CU	Total
other bd+	2	0	2
other bd-	66	34	100
Total	68	34	102

Fisher's exact test

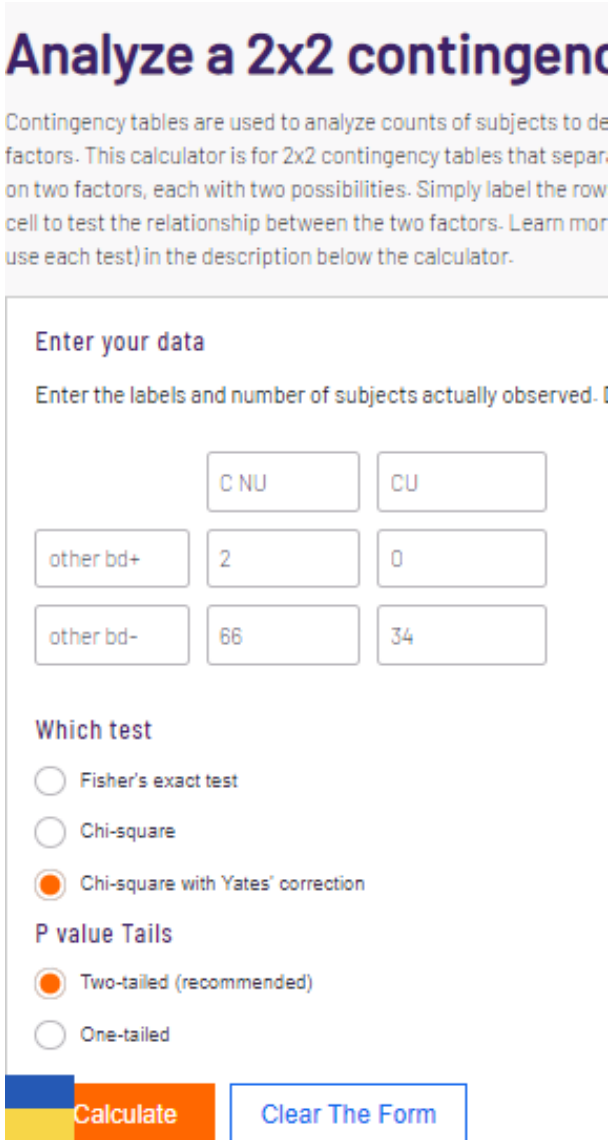
The two-tailed P value equals 0.5512

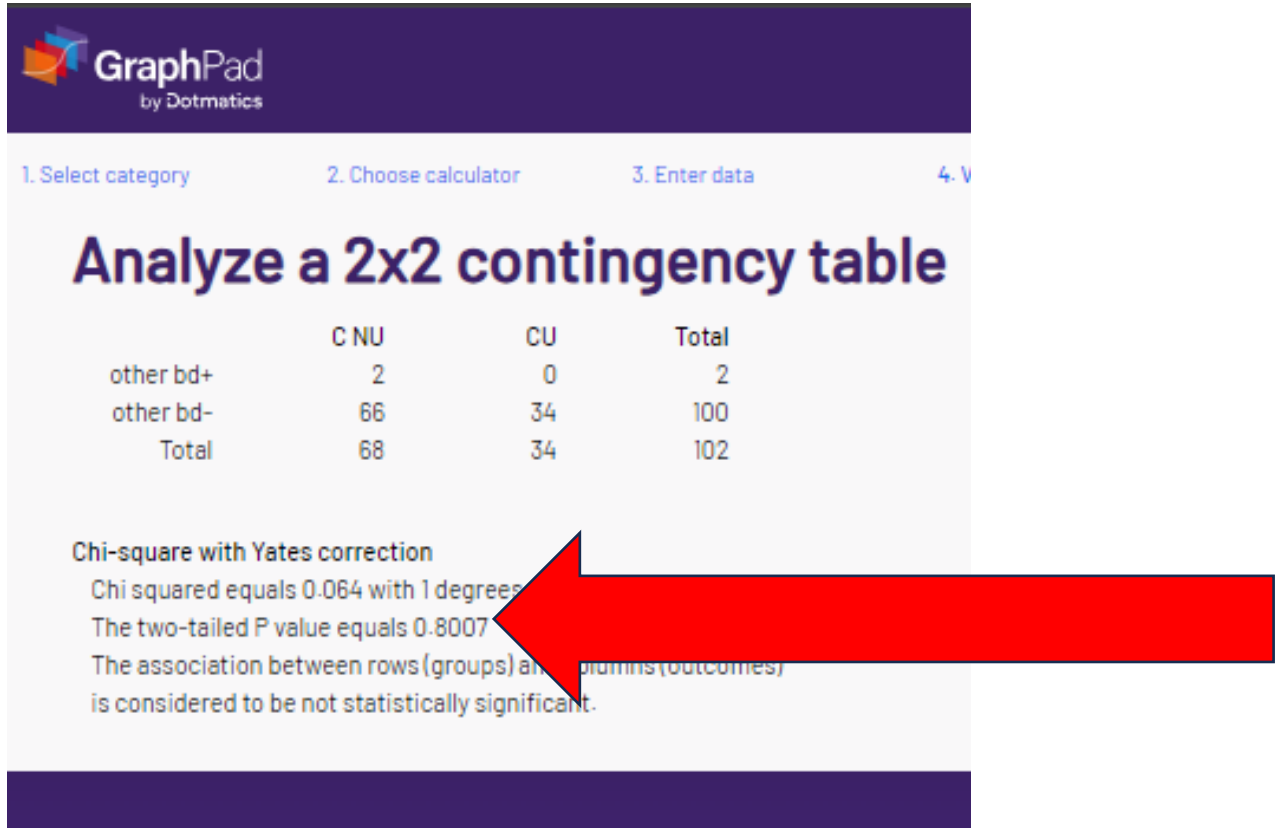
The association between rows (groups) a[illegible] (outcomes)

is considered to be not statistically significant.

For other background diseases, the “corrected” reported p-value was not verified with either Chi-square or Fisher’s.

K. “corrected” chi-sq or Fishers p = “1”





For other background diseases, the reported p-value was not verified with either chi-square, Fisher’s, or Yates. For p = 1.000, the % would have to be identical for both groups. If 2 per 68 total for CNU, then 1 per 34 for the CU group. As this was not listed, there appears to be an error in the original data.

L. “corrected” chi-sq or Fishers p = .8325

Analyze a 2x2 contingency table

Contingency tables are used to analyze counts of subjects to determine if there is assoc
two factors. This calculator is for 2x2 contingency tables that separate each subject into
categories based on two factors, each with two possibilities. Simply label the rows and c
type in the counts for each cell to test the relationship between the two factors. Learn m
contingency tables (along with when to use each test) in the description below the calcu

Enter your data

Enter the labels and number of subjects actually observed. Don't enter proportions, percentages or means.

	C NU	CU
nsclc+	37	20
nsclc-	31	14

Which test

- ○ Fisher's exact test
- ● Chi-square
- ○ Chi-square with Yates' correction

P value Tails

- ● Two-tailed (recommended)
- ○ One-tailed

GraphPad by Dotmatics

1. Select category 2. Choose calculator 3. Enter data 4. View resu

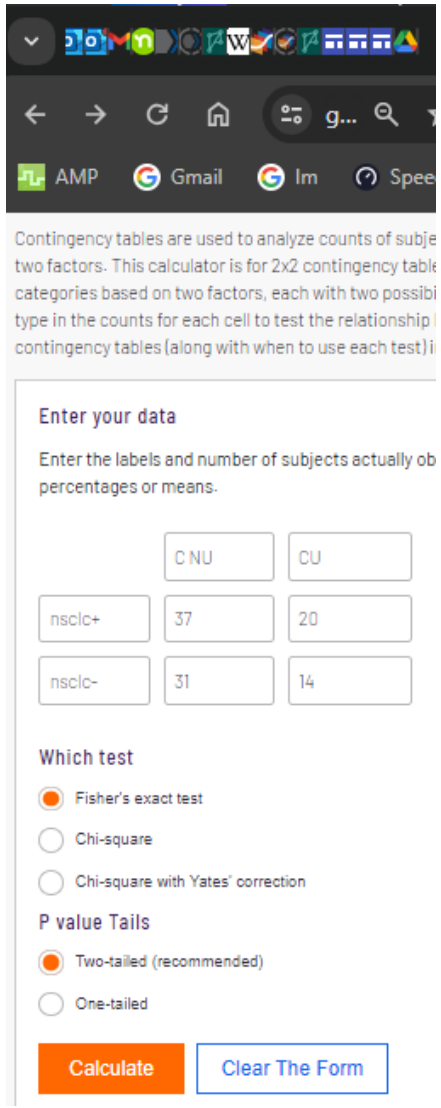
Analyze a 2x2 contingency table

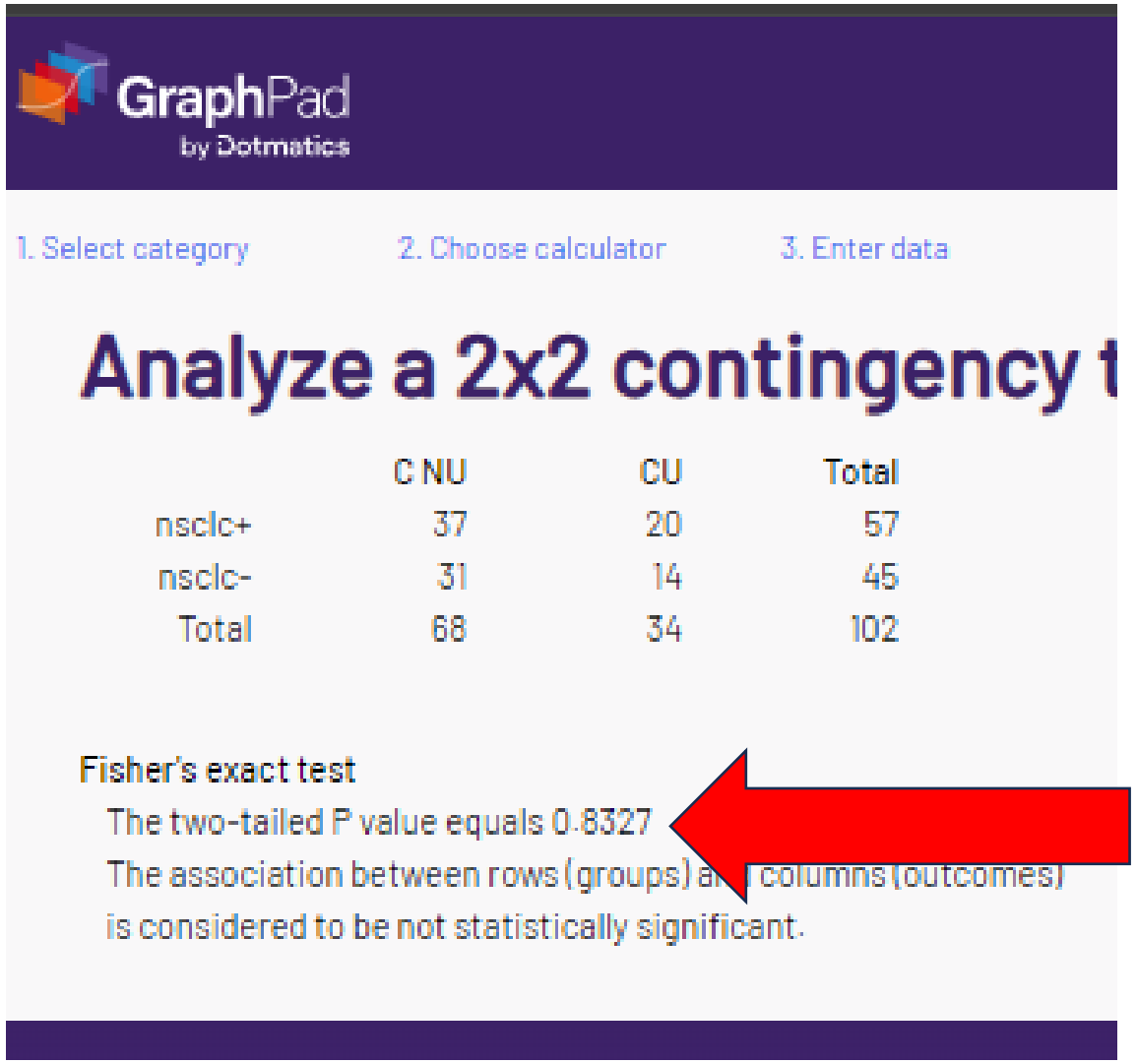
	C NU	CU	Total
nsclc+	37	20	57
nsclc-	31	14	45
Total	68	34	102

Chi-square without Yates correction

Chi squared equals 0.179 with 1 degrees o
The two-tailed P value equals 0.6723
The association between rows (groups) a columns (outcomes)
is considered to be not statistically significant.

L. “corrected” chi-sq or Fishers p = .8325





Not verified.

L. “corrected” chi-sq or Fishers p = .8325

Enter your data

Enter the labels and number of subjects actually obs
percentages or means.

	C NU	CU
nsclc+	37	20
nsclc-	31	14

Which test

- ○ Fisher's exact test
- ○ Chi-square
- ● Chi-square with Yates' correction

P value Tails

- ● Two-tailed (recommended)
- ○ One-tailed

Calculate | Clear The Form

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1. Select category 2. Choose calculator 3. Enter data 4. View res

Analyze a 2x2 contingency table

	C NU	CU	Total
nsclc+	37	20	57
nsclc-	31	14	45
Total	68	34	102

Chi-square with Yates correction

Chi squared equals 0.045 with 1 degrees o[illegible]

The two-tailed P value equals 0.8325

The association between rows (groups) an[illegible]olumns (outcomes)

is considered to be not statistically significant.

With the smallest cell = 14, Yates is the **wrong** statistic.
However, the p-value is reproduced for non small cell lung cancer.

M. “corrected” chi-sq or Fishers p = .414

Enter your data

Enter the labels and number of subjects actually
percentages or means.

	C NU	CU
melanoma+	25	9
melanoma-	43	25

Which test

- ○ Fisher's exact test
- ● Chi-square
- ○ Chi-square with Yates' correction

P value Tails

- ● Two-tailed (recommended)
- ○ One-tailed

Calculate | Clear The Form

GraphPad by Dotmatics

1. Select category 2. Choose calculator 3. Enter data 4. View results

Analyze a 2x2 contingency table

	C NU	CU	Total
melanoma+	25	9	34
melanoma-	43	25	68
Total	68	34	102

Chi-square without Yates correction

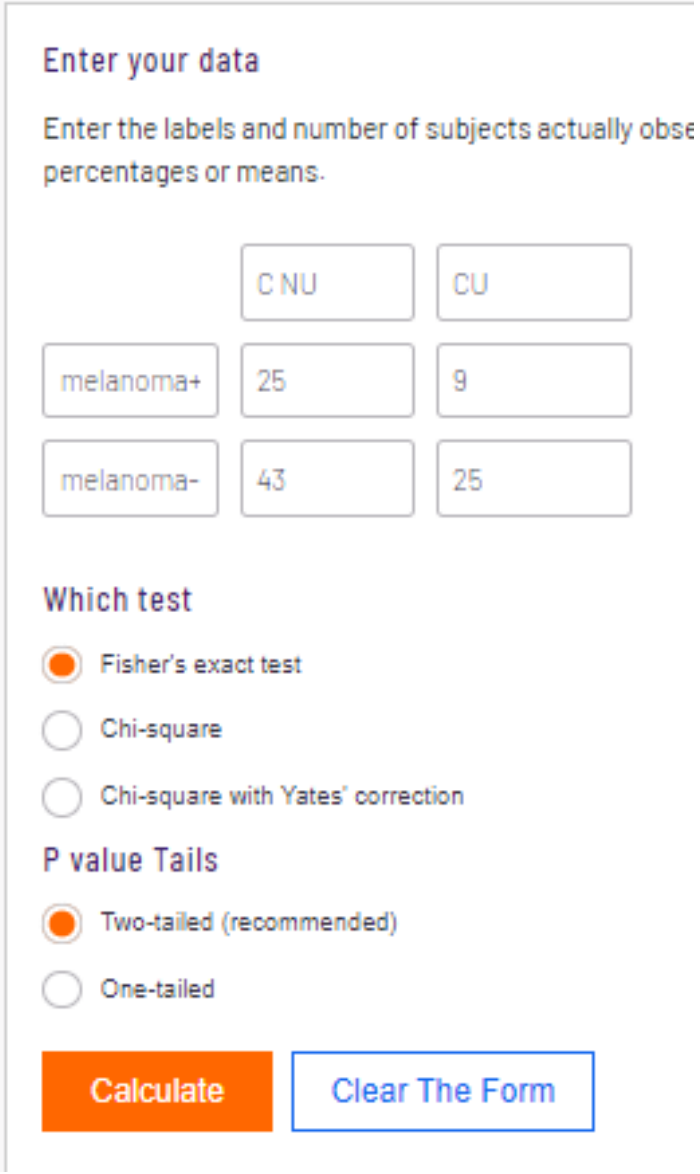
Chi squared equals 1.081 with 1 degrees of

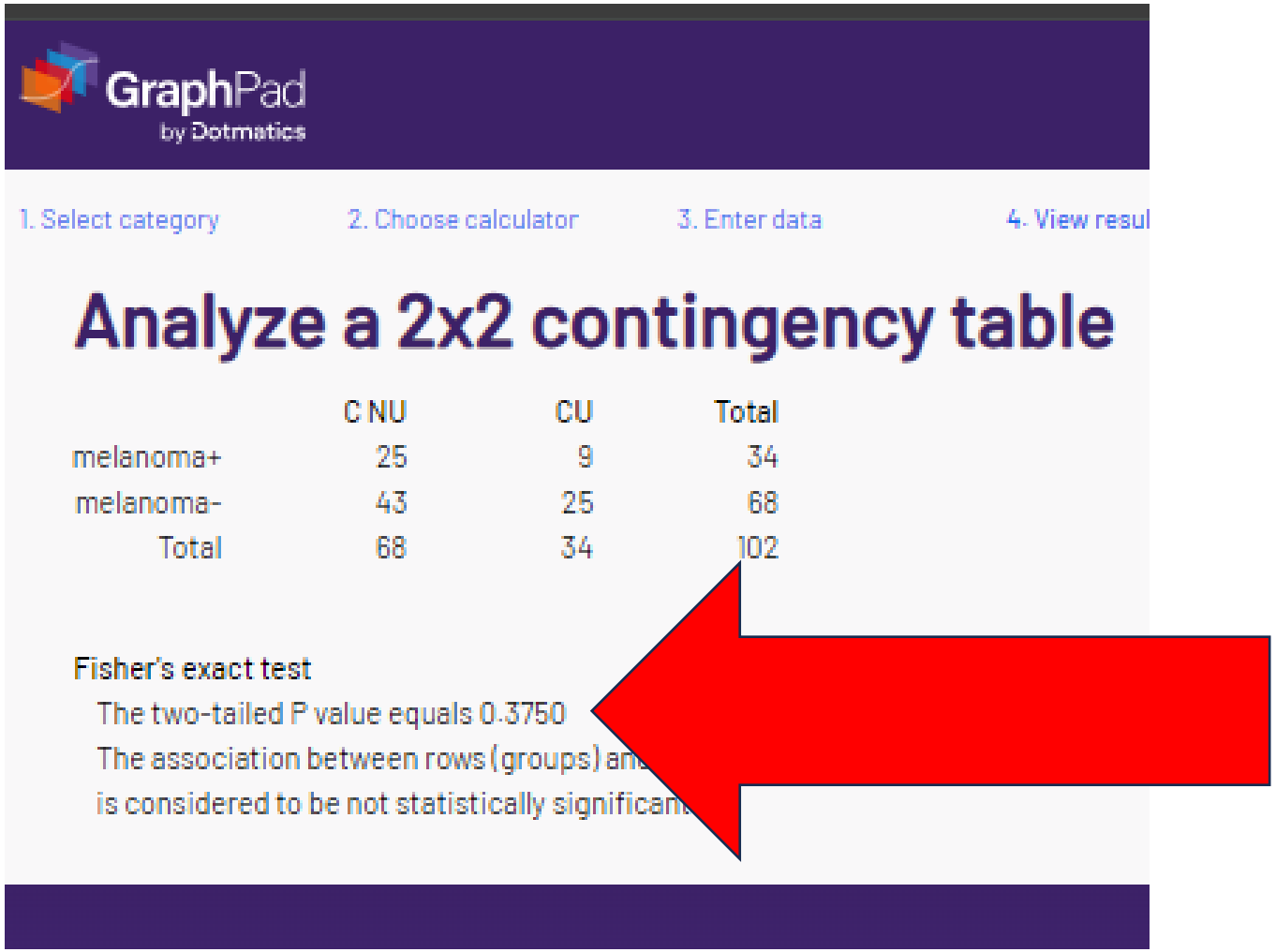
The two-tailed P value equals 0.2985

The association between rows (groups) and

is considered to be not statistically significant

M. “corrected” chi-sq or Fishers p = .414





The reported “corrected” p values for melanoma were not verified with chi-square or Fisher’s.

M. “corrected” chi-sq or Fishers p = .414

Enter your data

Enter the labels and number of subjects actually ot
percentages or means.

	C NU	CU
melanoma+	25	9
melanoma-	43	25

Which test

- ○ Fisher's exact test
- ○ Chi-square
- ● Chi-square with Yates' correction

P value Tails

- ● Two-tailed (recommended)
- ○ One-tailed

Calculate | Clear The Form

GraphPad by Dotmatics

1. Select category 2. Choose calculator 3. Enter data 4. View resu

Analyze a 2x2 contingency table

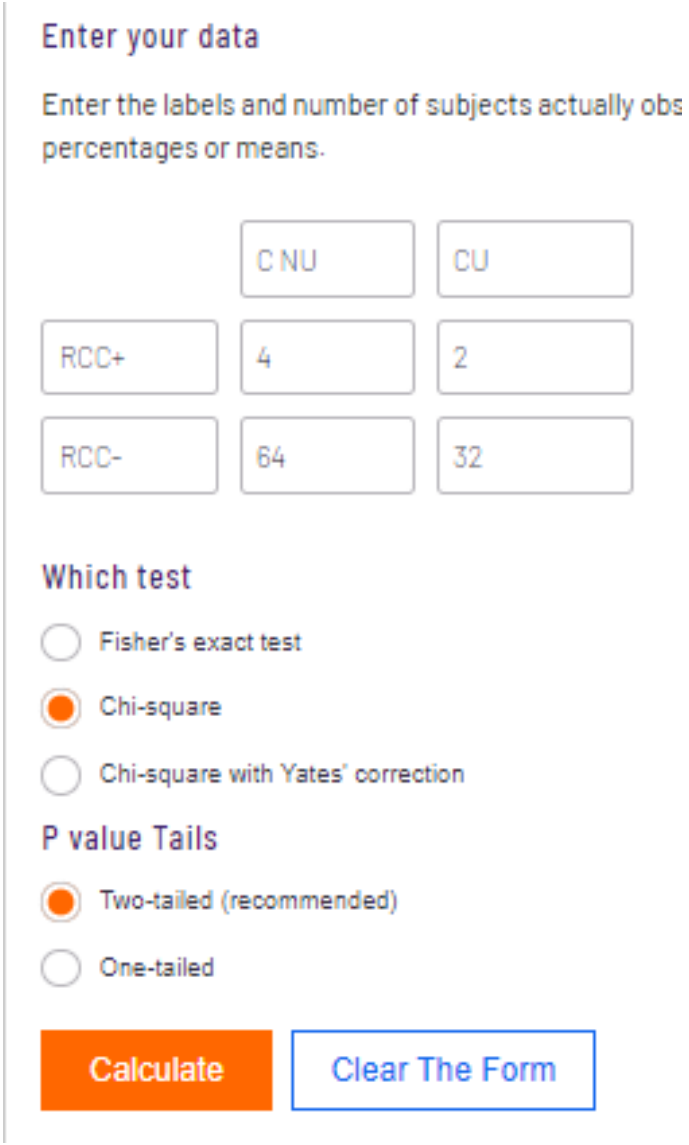
	C NU	CU	Total
melanoma+	25	9	34
melanoma-	43	25	68
Total	68	34	102

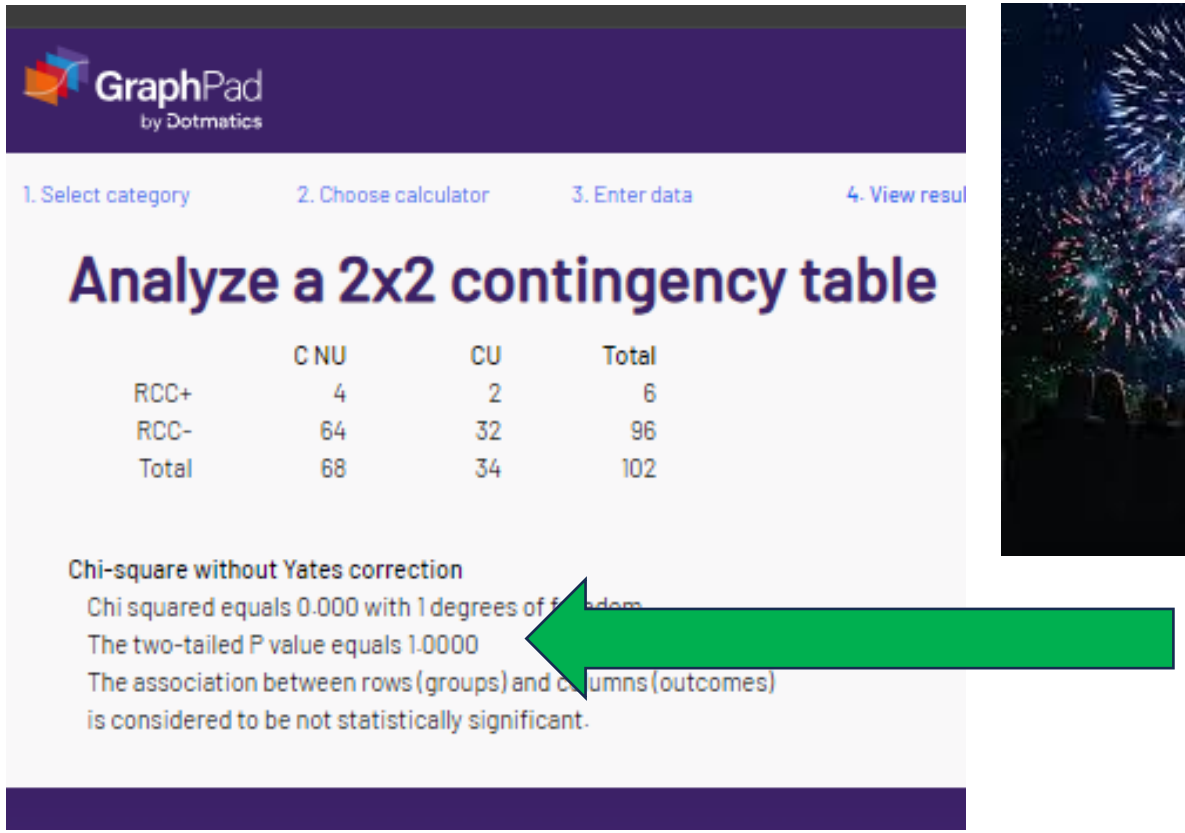
Chi-square with Yates correction

Chi squared equals 0.667 with 1 degrees of freedom.
The two-tailed P value equals 0.4140
The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.

With a smallest N / cell of 9, Yates is an **inappropriate** statistic. However, this corresponds with the p-value reported.

N. “corrected” chi-sq or Fishers p = “1”





The reported p value for Renal Cell Carcinoma is verified!

N. “corrected” chi-sq or Fishers p = “1”

Enter your data

Enter the labels and number of subjects actually observed. Don'

	C NU	CU
RCC+	4	2
RCC-	64	32

Which test

- (●) Fisher's exact test
- ( ) Chi-square
- ( ) Chi-square with Yates' correction

P value Tails

- (●) Two-tailed (recommended)
- ( ) One-tailed

Calculate | Clear The Form

Analyze a 2x2 contingency table

	C NU	CU	Total
RCC+	4	2	6
RCC-	64	32	96
Total	68	34	102

Fisher's exact test

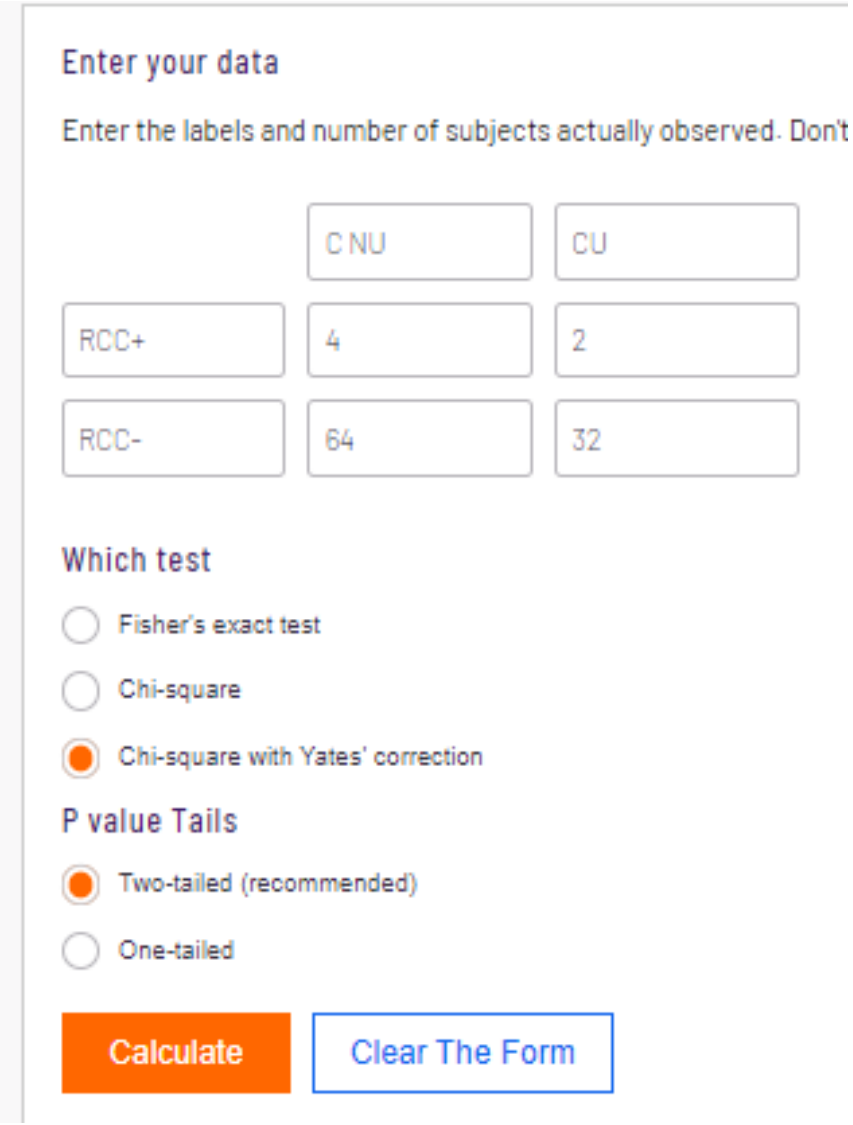
The two-tailed P value equals 1.0000

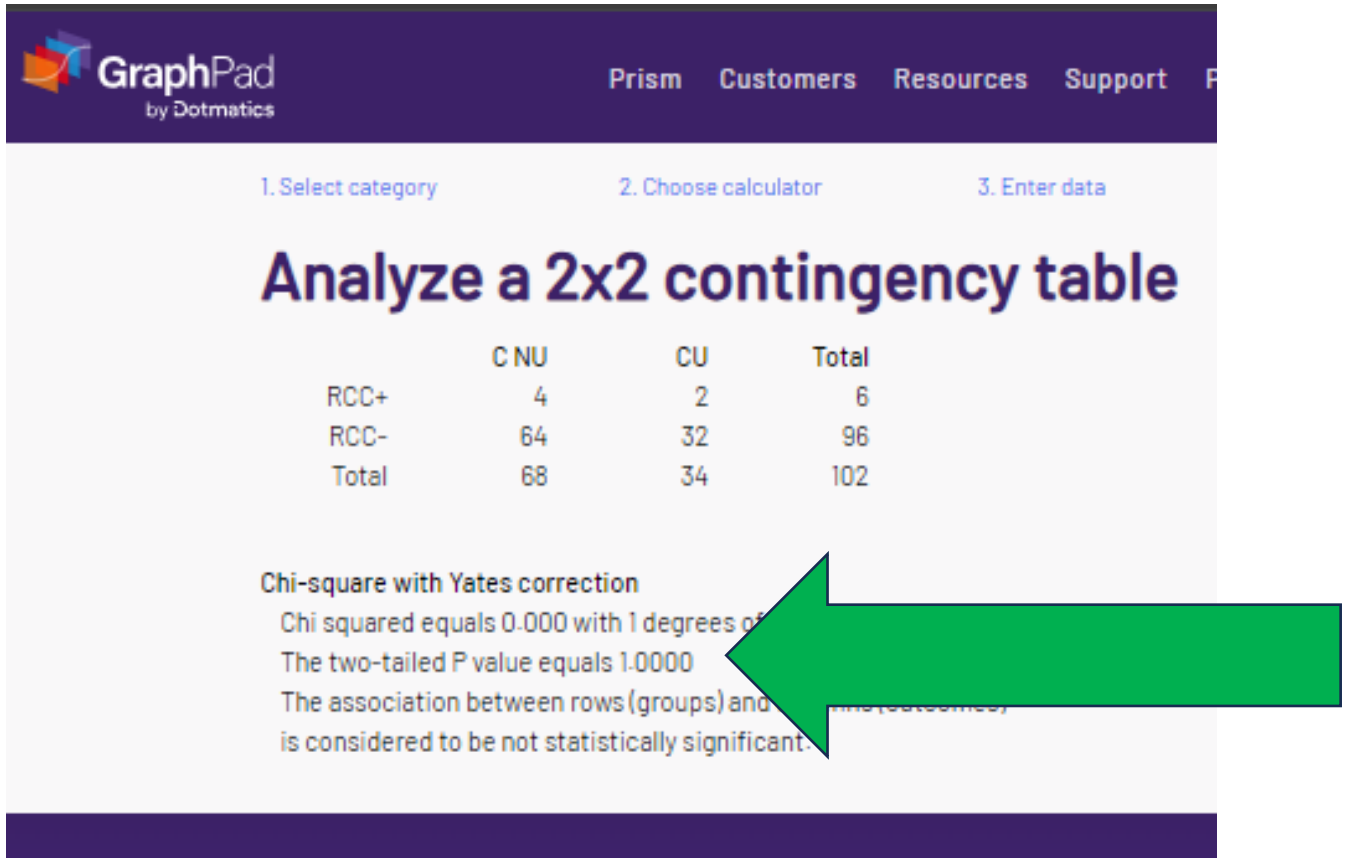
The association between rows (groups) a

is considered to be not statistically significant.

The result has been verified!

N. “corrected” chi-sq or Fishers p = “1”





In this circumstance, all three statistics give the same result.

O. “corrected” chi-sq or Fishers p = “1”

Enter your data

Enter the labels and number of subjects actually observed. Dor

	C NU	CU
other mal+	2	3
other mal-	66	31

Which test

- ○ Fisher's exact test
- ● Chi-square
- ○ Chi-square with Yates' correction

P value Tails

- ● Two-tailed (recommended)
- ○ One-tailed

Calculate | Clear The Form

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Prism Customers Resources Support

1. Select category 2. Choose calculator 3. Enter data

Analyze a 2x2 contingency table

	C NU	CU	Total
other mal+	2	3	5
other mal-	66	31	97
Total	68	34	102

Chi-square without Yates correction

Chi squared equals 1.682 with 1 degrees of

The two-tailed P value equals 0.1946

The association between rows (groups) and

is considered to be not statistically significant.

O. “corrected” chi-sq or Fishers p = “1”

Enter your data

Enter the labels and number of subjects actually observed. Don't e

	C NU	CU
other mal+	2	3
other mal-	66	31

Which test

- (●) Fisher's exact test
- ( ) Chi-square
- ( ) Chi-square with Yates' correction

P value Tails

- (●) Two-tailed (recommended)
- ( ) One-tailed

Calculate | Clear The Form

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Prism Customers Resources Support P

1. Select category 2. Choose calculator 3. Enter data

Analyze a 2x2 contingency table

	C NU	CU	Total
other mal+	2	3	5
other mal-	66	31	97
Total	68	34	102

Fisher's exact test

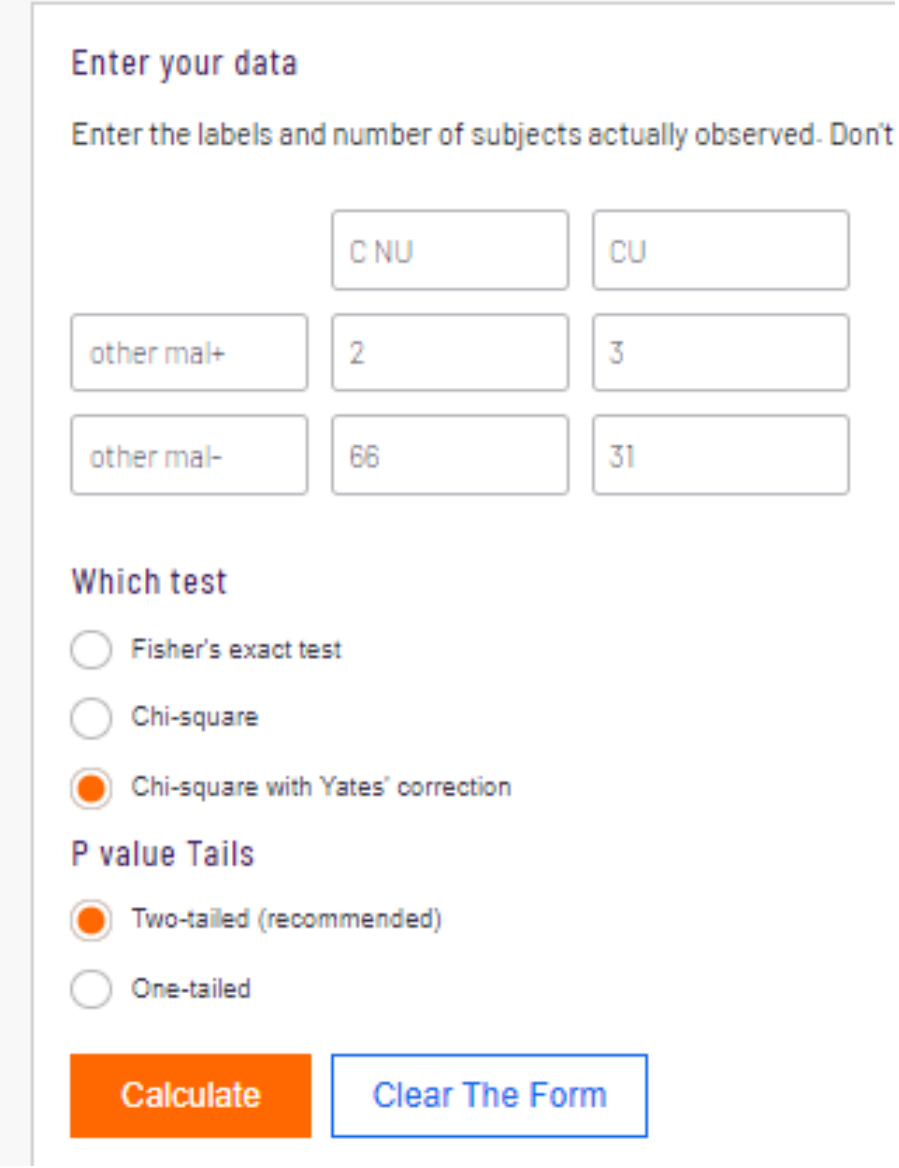
The two-tailed P value equals 0.3300

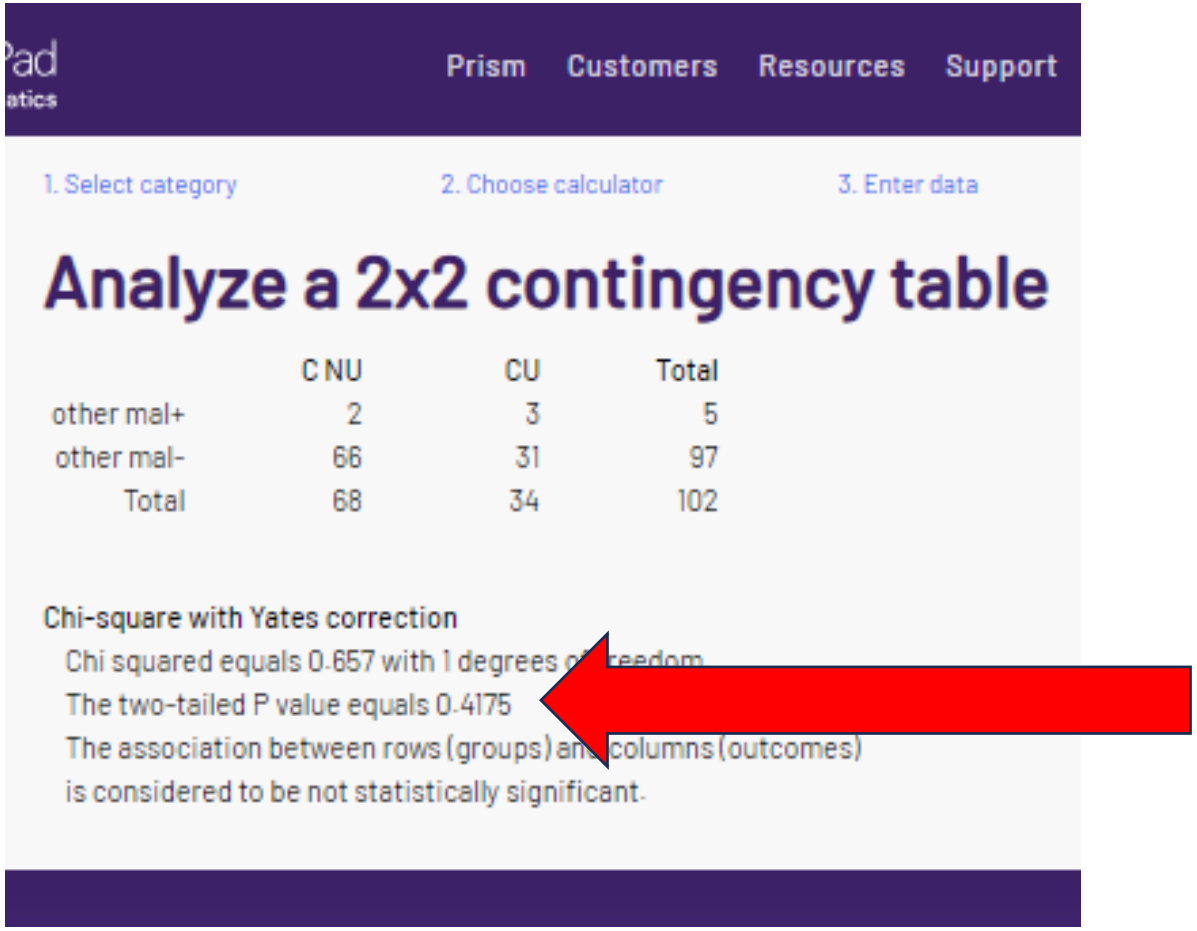
The association between rows (groups) an

is considered to be not statistically significan

The reported p-value was **not** verified.

O. “corrected” chi-sq or Fishers p = “1”





The reported p value for other malignancies was **not** verified.

P. “corrected” chi-sq or Fishers p = .6593

Enter your data

Enter the labels and number of subjects actually observed. Don

	C NU	CU
brain +	12	8
brain-	56	26

Which test

- ○ Fisher's exact test
- ● Chi-square
- ○ Chi-square with Yates' correction

P value Tails

- ● Two-tailed (recommended)
- ○ One-tailed

Calculate | Clear The Form

1. Select category 2. Choose calculator 3. Enter data

Analyze a 2x2 contingency table

	C NU	CU	Total
brain +	12	8	20
brain-	56	26	82
Total	68	34	102

Chi-square without Yates correction

Chi squared equals 0.498 with 1 degrees of freedom.

The two-tailed P value equals 0.4806

The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.

P. “corrected” chi-sq or Fishers p = .6593

Enter your data

Enter the labels and number of subjects actually observed. Don't

	C NU	CU
brain +	12	8
brain-	56	26

Which test

- (●) Fisher's exact test
- ( ) Chi-square
- ( ) Chi-square with Yates' correction

P value Tails

- (●) Two-tailed (recommended)
- ( ) One-tailed

Calculate | Clear The Form

Pad ...atics

Prism Customers Resources Support

1. Select category 2. Choose calculator 3. Enter data

Analyze a 2x2 contingency table

	C NU	CU	Total
brain +	12	8	20
brain-	56	26	82
Total	68	34	102

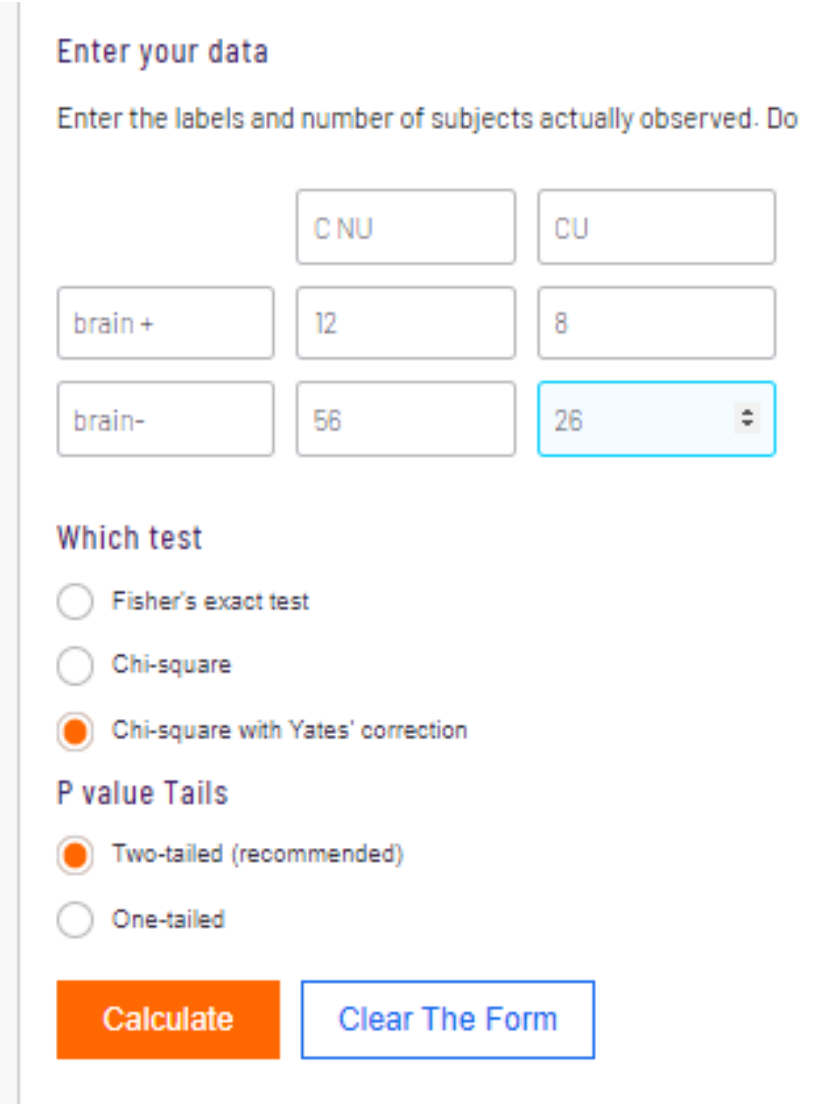
Fisher's exact test

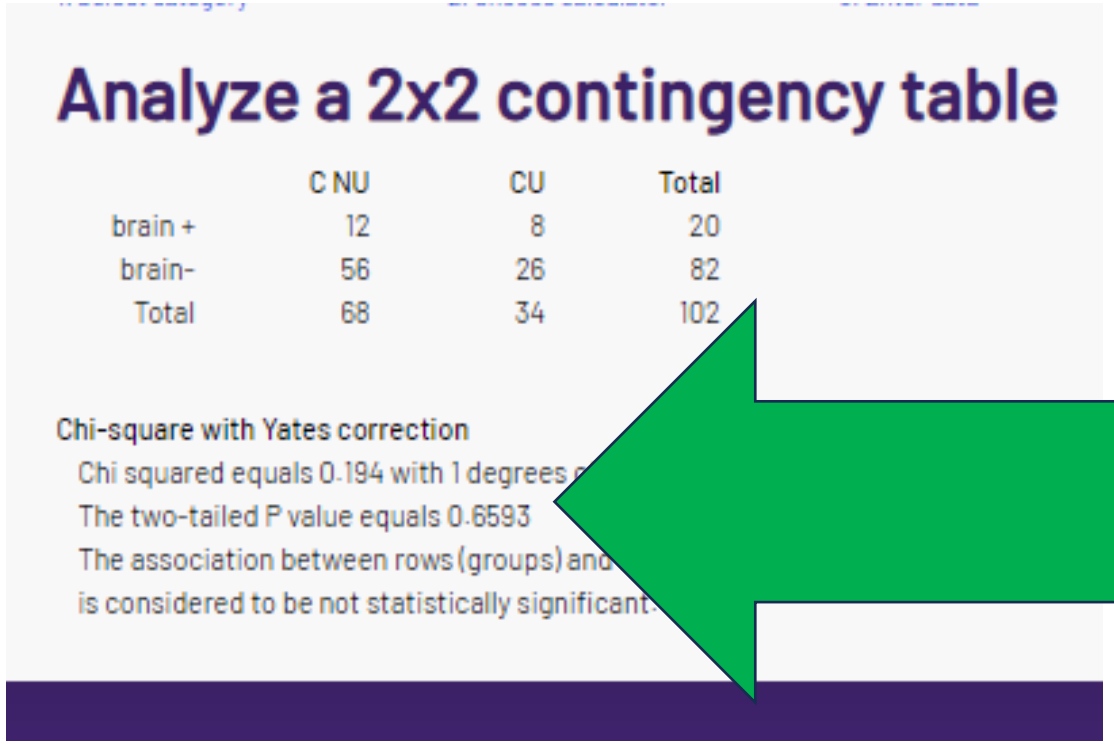
The two-tailed P value equals 0.5976

The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.

The reported p-values for brain metastasis were **not** verified.

P. “corrected” chi-sq or Fishers p = .6593





For the smallest N per cell = 8, Yates would typically not be considered the right statistic. However, the reported p value corresponds with Yates.

Q. “corrected” chi-sq or Fishers p = .4303

Enter your data

Enter the labels and number of subjects actually observed. Don't e

	C NU	CU
lungs +	39	23
lungs-	29	11

Which test

- Fisher's exact test
- Chi-square
- Chi-square with Yates' correction

P value Tails

- Two-tailed (recommended)
- One-tailed

Calculate | Clear The Form

Analyze a 2x2 contingency table

	C NU	CU	Total
lungs +	39	23	62
lungs-	29	11	40
Total	68	34	102

Chi-square without Yates correction

Chi squared equals 1.008 with 1 degrees o

The two-tailed P value equals 0.3155

The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.

Q. “corrected” chi-sq or Fishers p = .4303

Enter your data

Enter the labels and number of subjects actually observed. Dor

	C NU	CU
lungs +	39	23
lungs-	29	11

Which test

- (●) Fisher's exact test
- ( ) Chi-square
- ( ) Chi-square with Yates' correction

P value Tails

- (●) Two-tailed (recommended)
- ( ) One-tailed

Calculate | Clear The Form

1. Select category 2. Choose calculator 3. Enter data

Analyze a 2x2 contingency table

	C NU	CU	Total
lungs +	39	23	62
lungs-	29	11	40
Total	68	34	102

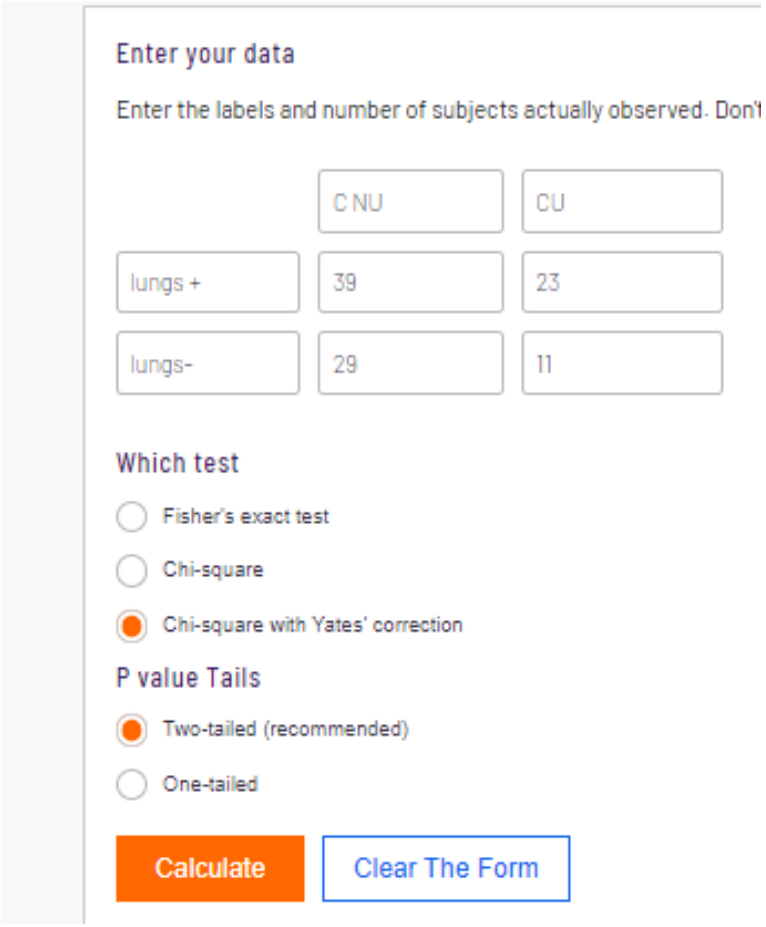
Fisher's exact test

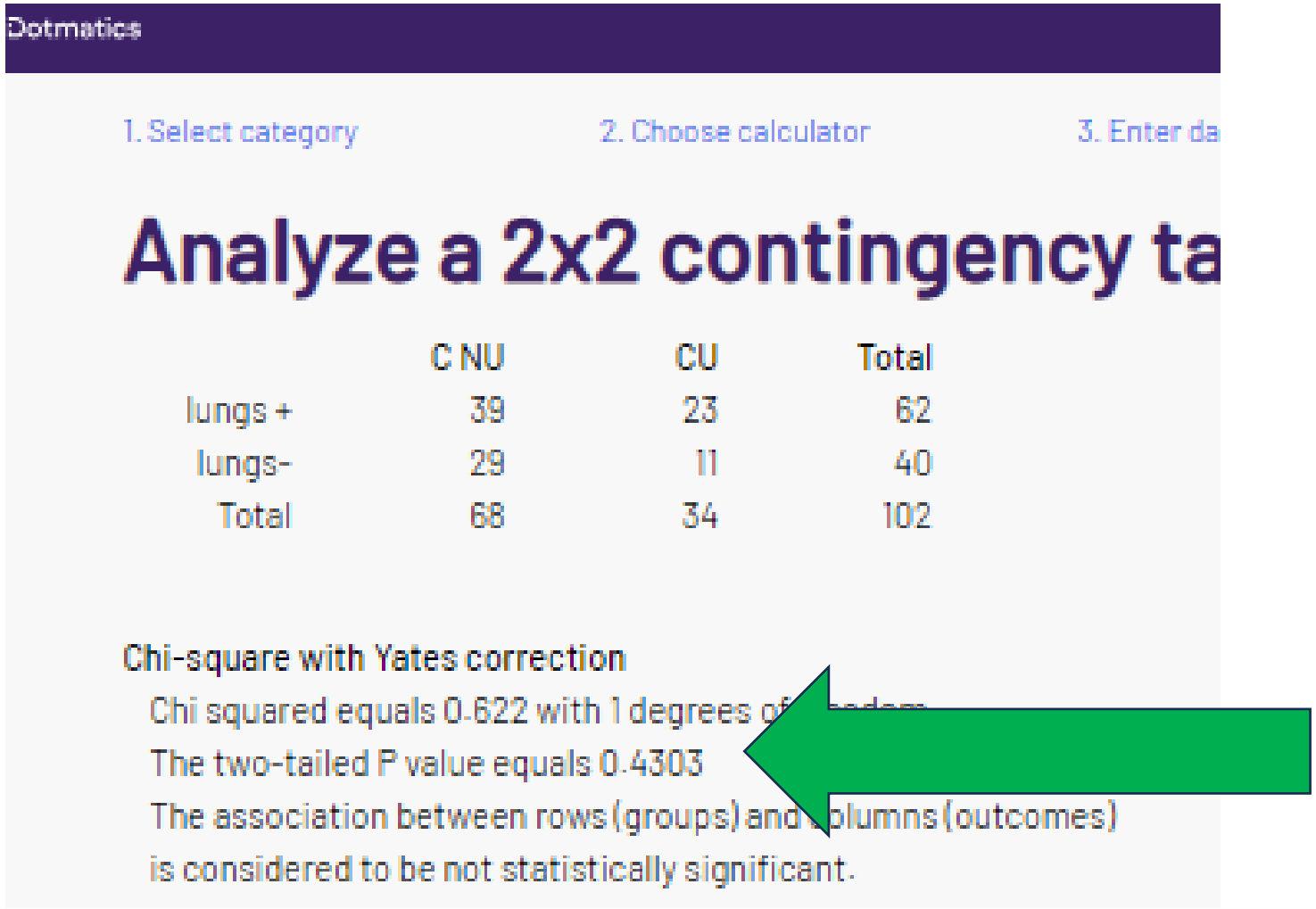
The two-tailed P value equals 0.3914

The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.

The reported p value for lung metastasis could **not** be verified.

Q. “corrected” chi-sq or Fisher’s p = .4303





With the smallest N per cell = 11, Yates correction is typically **not** employed. However, the p-value can be reproduced.

R. “corrected” chi-sq or Fishers p = .2157

Enter your data

Enter the labels and number of subjects actually observe
means.

	C NU	CU
liver +	13	11
liver-	55	23

Which test

- ○ Fisher's exact test
- ● Chi-square
- ○ Chi-square with Yates' correction

P value Tails

- ● Two-tailed (recommended)
- ○ One-tailed

Calculate | Clear The Form

GraphPad by Dotmatics

1. Select category 2. Choose calculator 3. Enter data 4. Vi

Analyze a 2x2 contingency table

	C NU	CU	Total
liver +	13	11	24
liver-	55	23	78
Total	68	34	102

Chi-square without Yates correction

Chi squared equals 2.207 with 1 degrees o

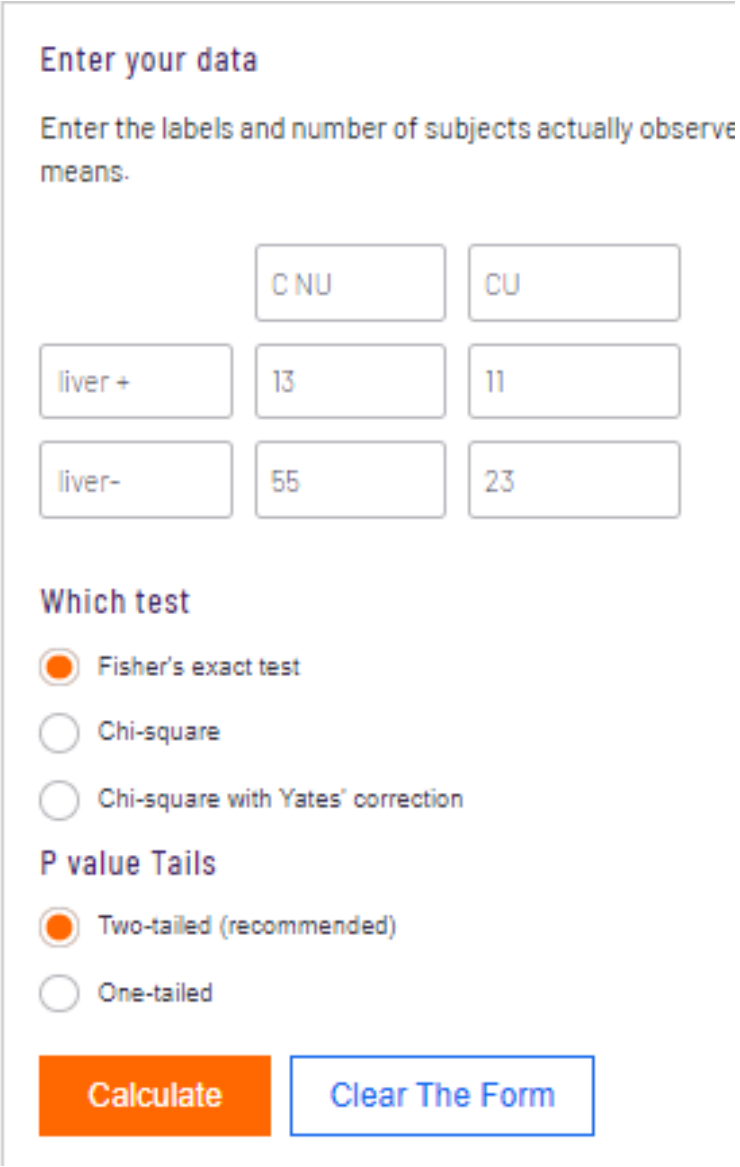
The two-tailed P value equals 0.1374

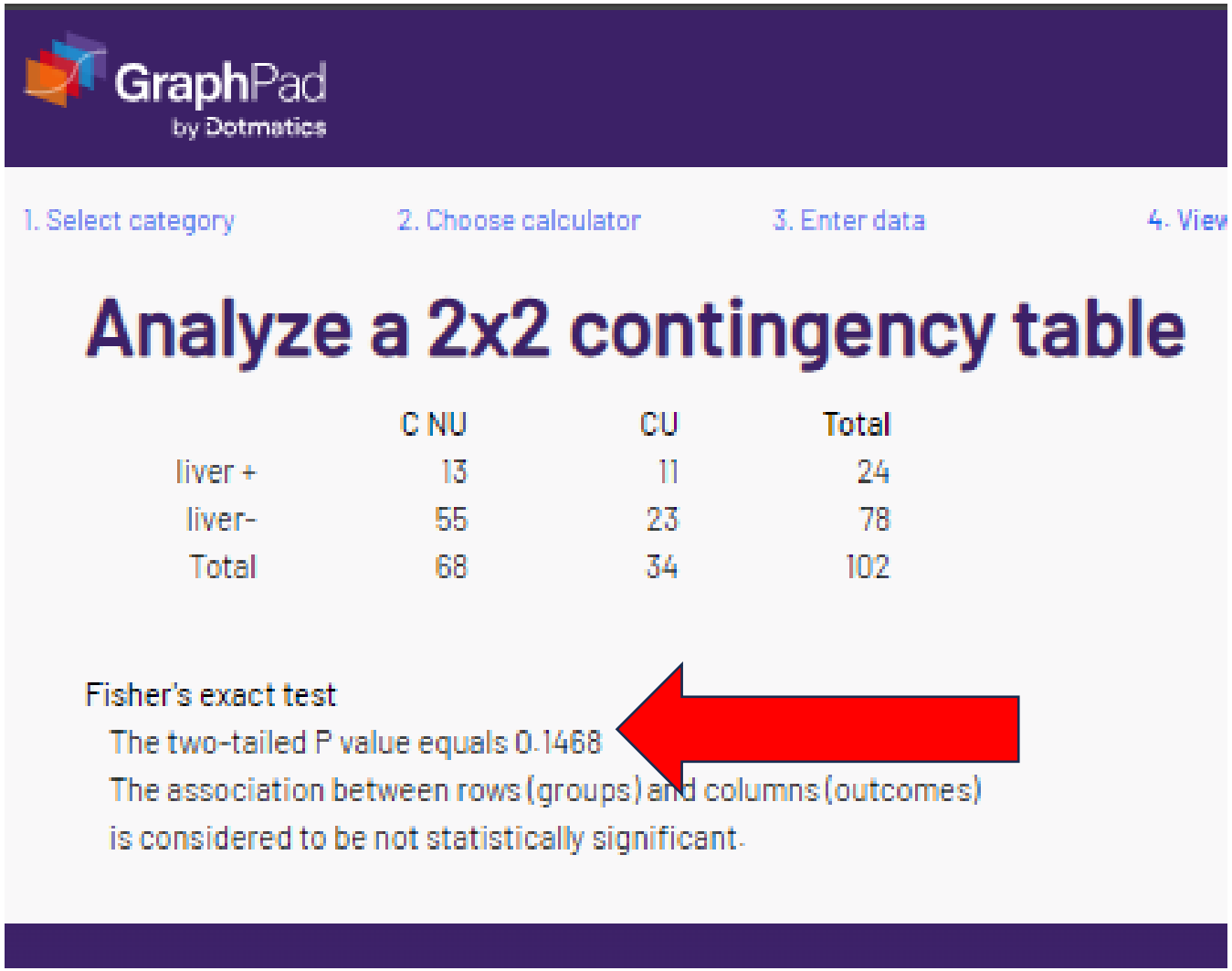
The association between rows (groups) and olumns (outcomes)

is considered to be not statistically significant.

Note large >= 11 cell values.

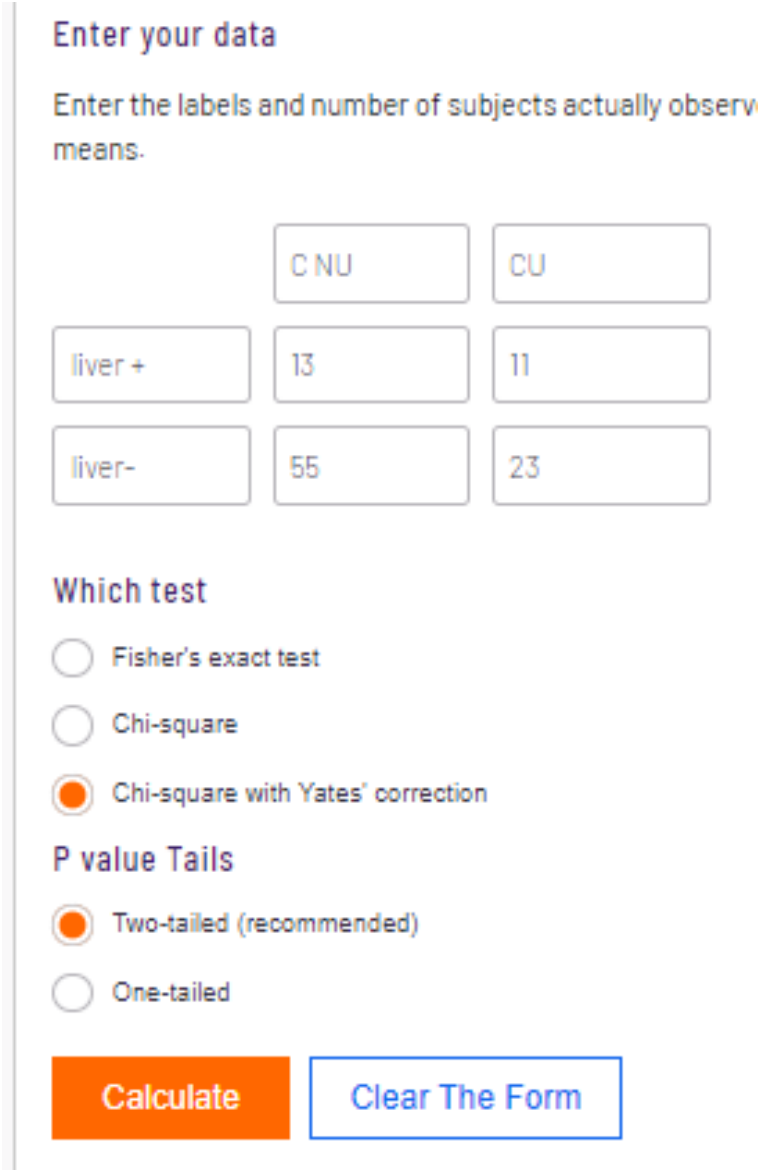
R. “corrected” chi-sq or Fishers p = .2157

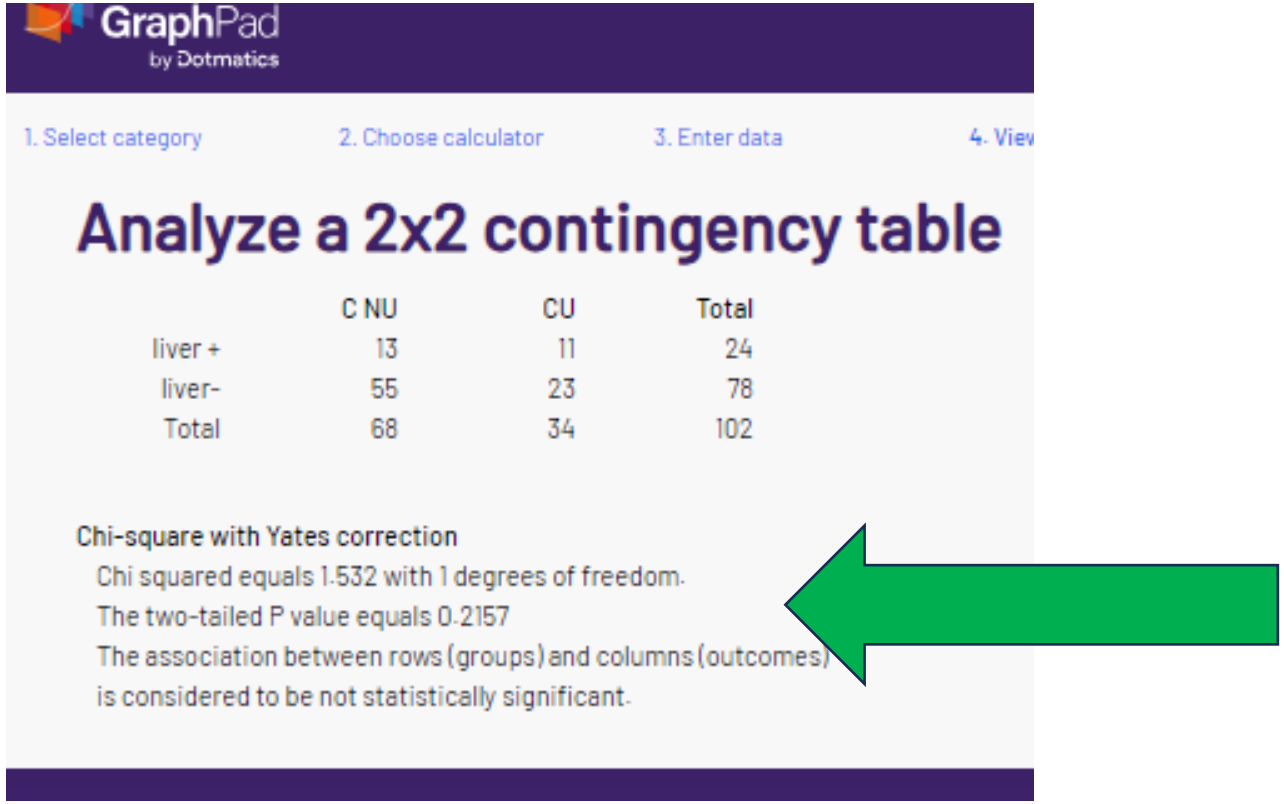




The reported p-values could **not** be verified.

R. “corrected” chi-sq or Fishers p = .2157





With the smallest N per cell = 11, Yates is **not** appropriate.
However, the p value is reproduced with this incorrect statistic.

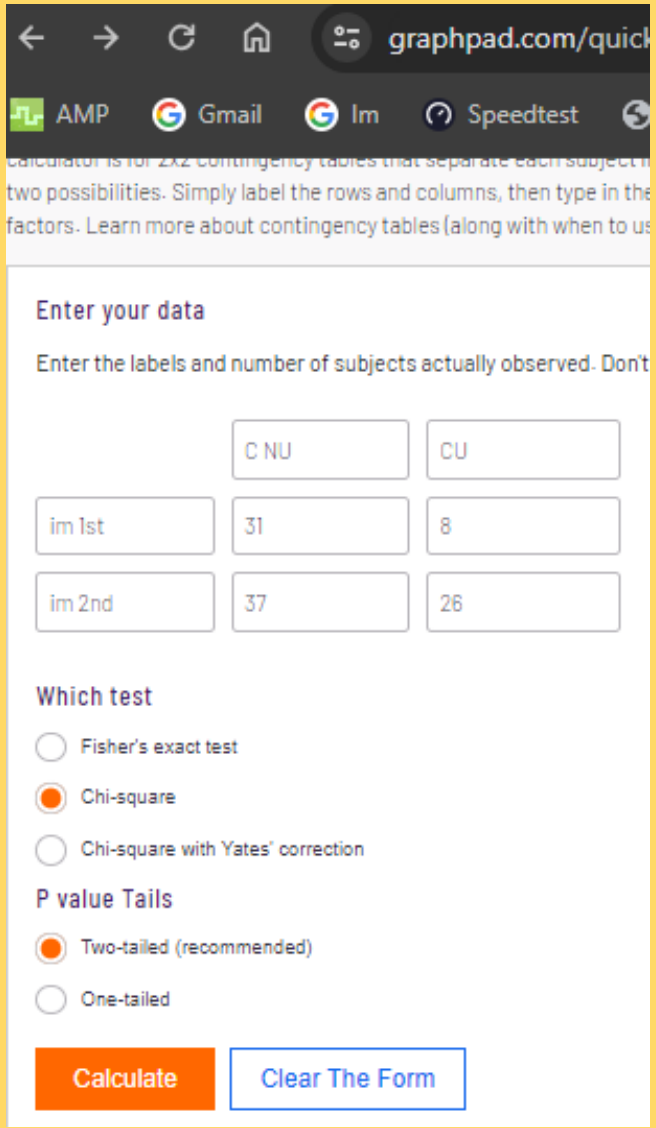
Table 1. *Cont.* (page 2)

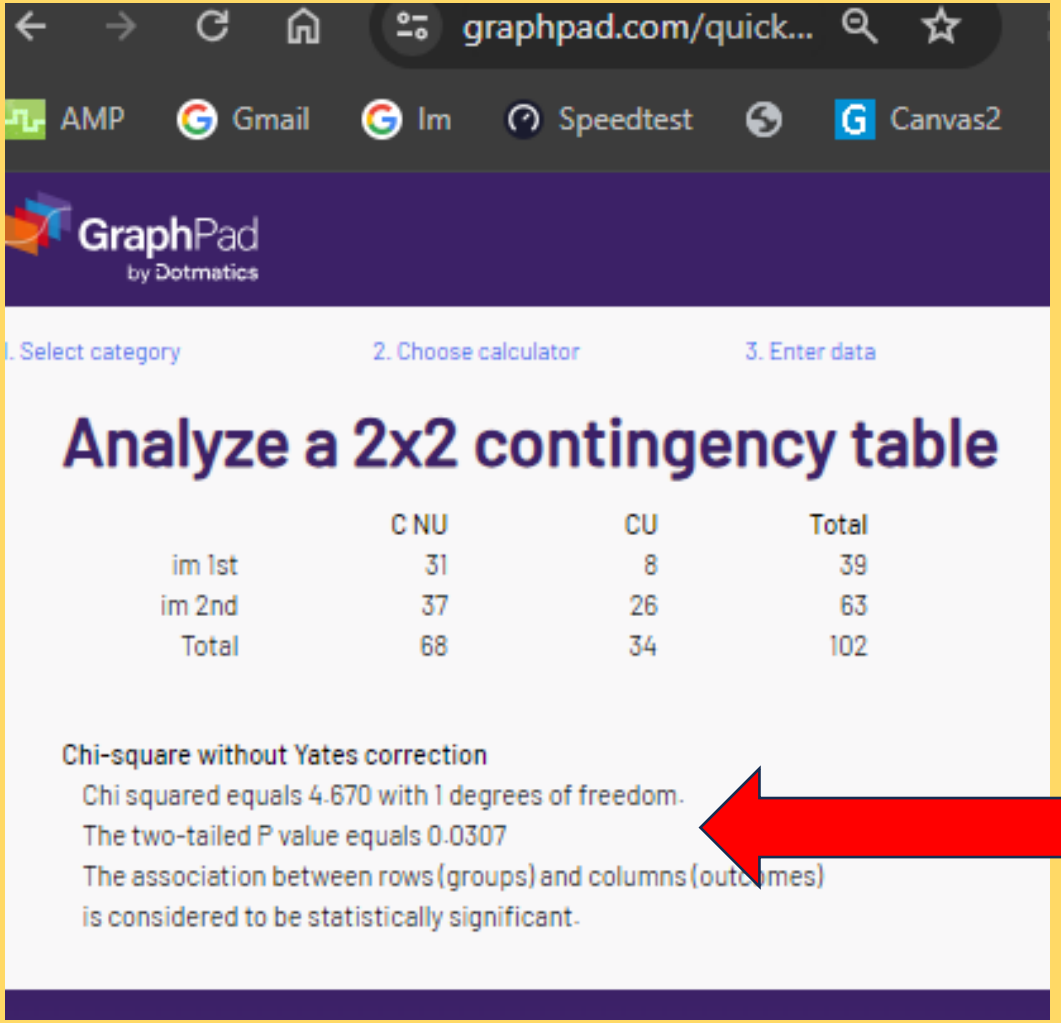
	Characteristics	Cannabis Non-Users N = 68		Cannabis Users N = 34		*p*-Value	P values: Chi-sq	Fisher's	Chi-sq w/Yates
	Immunotherapy given as—*N* (%)								
S	First line of treatment	31 (45.5)	45.6	8 (23.5)	23.5	0.05178	.0307	.0334	.0518
	Second line of treatment or more	37 (54.4)	54.4	26 (76.4)	76.5	0.05178			
	Checkpoint therapy—*N* (%)								
T	Anti PD1: Pembrolizumab or Nivolumab	47 (69.1)	69.1	29 (85.2)	85.3	0.127	.0772	.0945	.1270
U	Ipilimumab and Nivolumab	16 (23.5)	23.5	4 (11.7)	11.8	0.2517	.1583	.1934	.2517
V	Anti PDL-1: Durvalumab or Atezolizumab	5 (7.3)	7.4	1 (2.9)	2.9	1	..3720	.6607	.6554

Key: green = % calculated (rounded) correctly
red = % calculated (rounding) incorrectly

P values calculated with GraphPad Prism. Although it is theoretically possible that the differences are due to software (Bel-Sala used SAS), we think this is exceedingly unlikely for simple non-parametric statistic like this. It is much more likely (based on values corresponding to 4 decimal places) that the authors simply ran a different statistic than was reported. Unfortunately, the statistic that was run (chi-square with Yates correction) is (again) only appropriate with a expected cell N of < 5 (Wikipedia) Or 0-9 (BMJ Guidance).

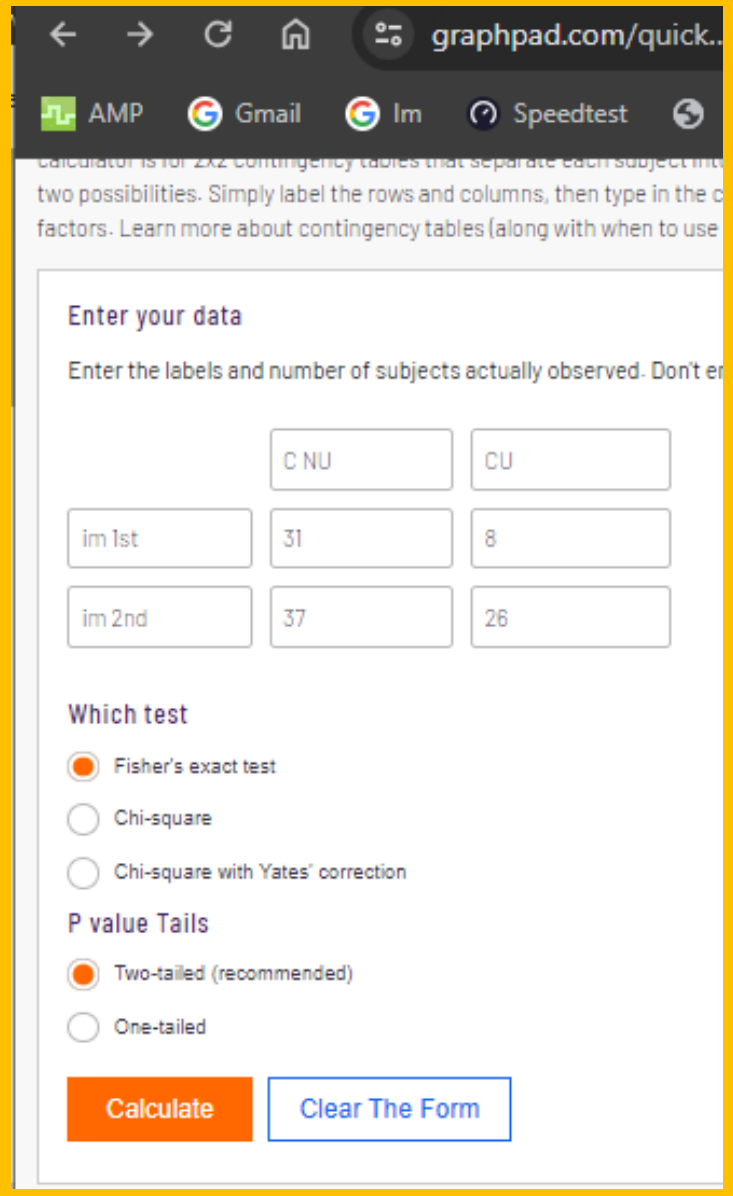
S. “corrected” chi-sq or Fisher’s p value is .05178

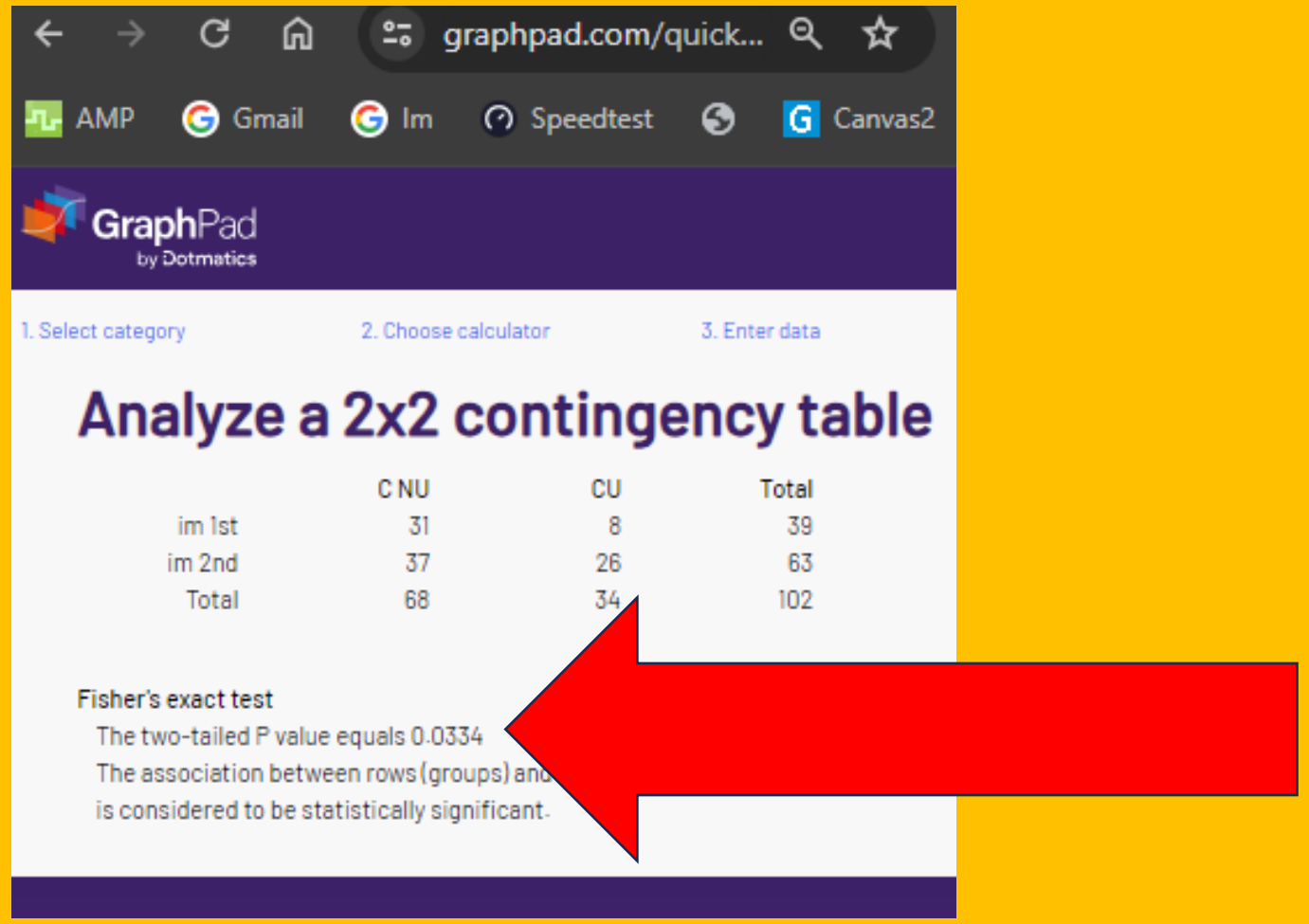




It is interesting that this is the only p value on Table 1 that the authors reported to 5 decimal places.

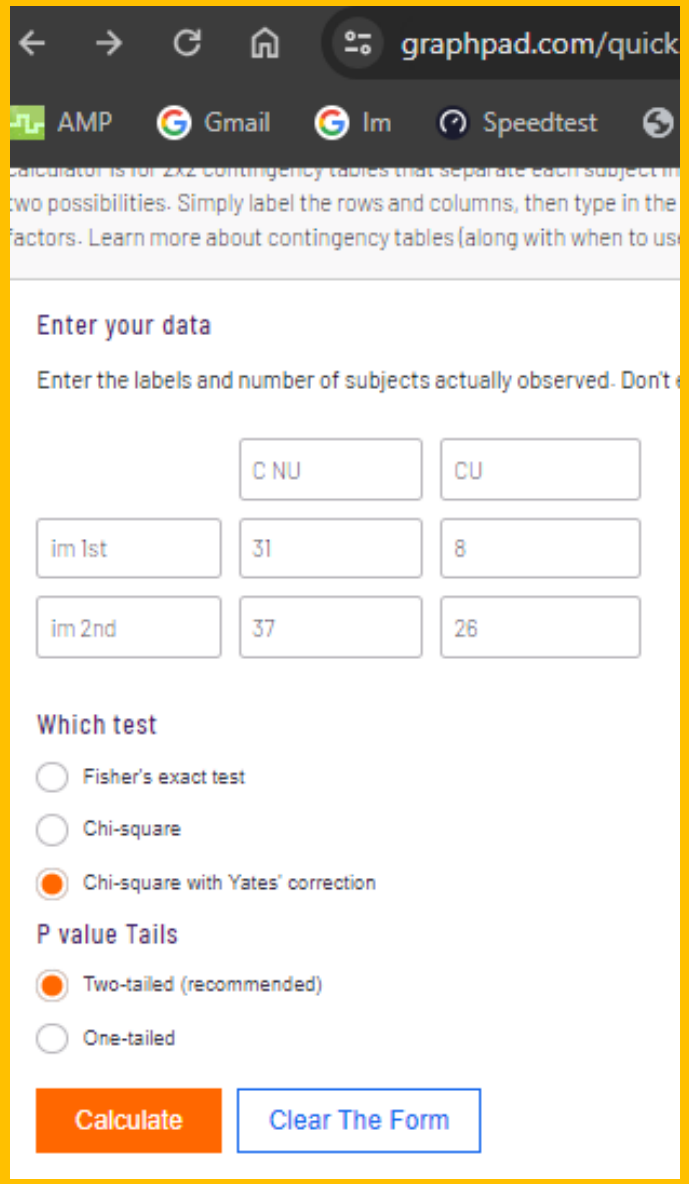
S. “corrected” chi-sq or Fisher’s p value is .05178

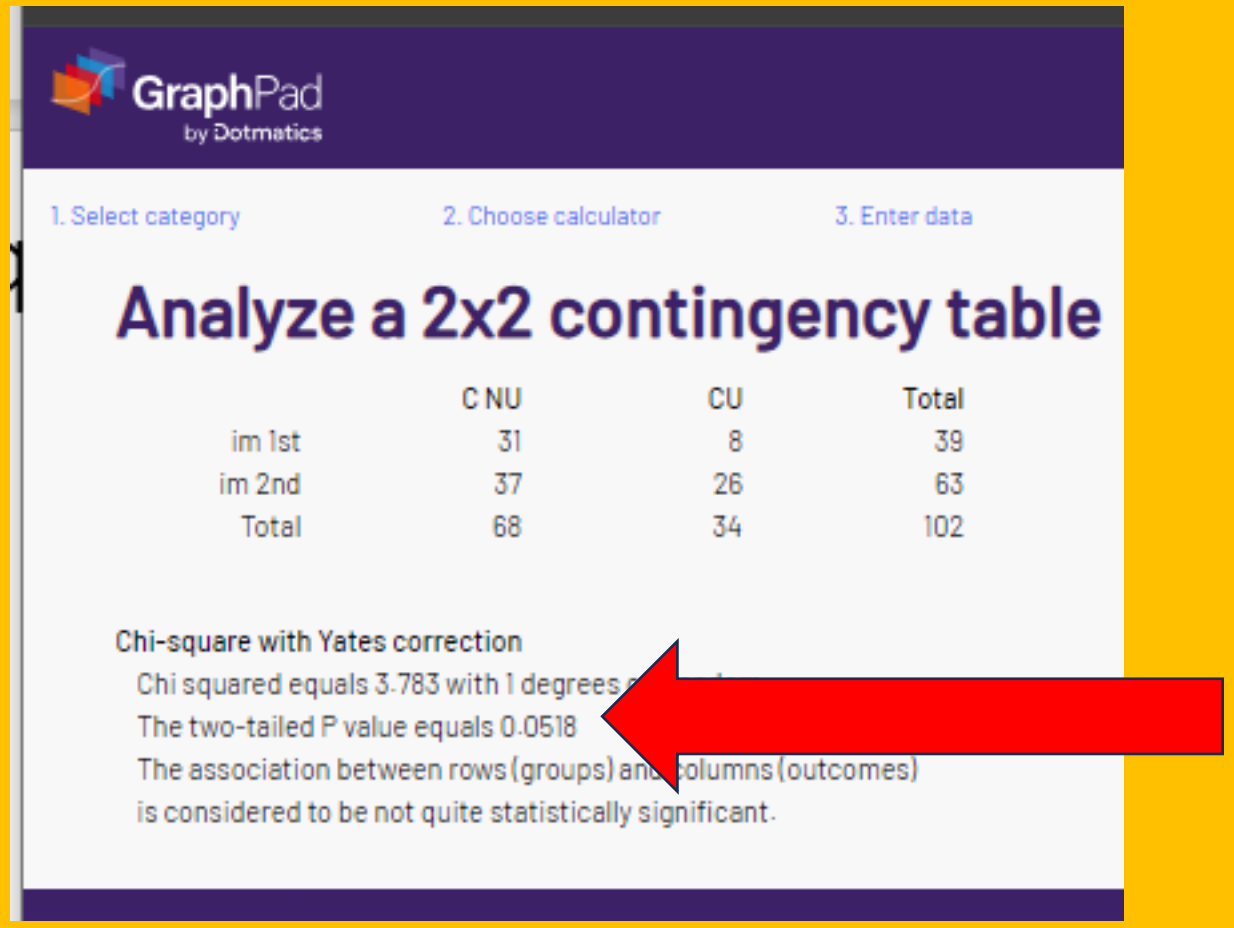




The reported p value for immunotherapy 1st vs 2nd could not be verified with either chi-square or Fisher’s exact test. As this manuscript is about immunotherapy, this significant ($p < .05$) difference could be an important confound. This was not addressed In the data-analysis (e.g. ANCOVA) or in the discussion section.

S. “corrected” chi-sq or Fisher’s p value is .05178





The smallest cell N is 8 so Yates would **not** be appropriate. Although Prism only reports to 4 decimal places, with rounding, the “corrected” p value is reproduced, albeit with a statistic that is both inappropriate (arguably) and not described in the methods.

T. “corrected” chi-sq or Fisher’s = .127

Analyze a 2x2 contingency

Contingency tables are used to analyze counts of subjects to determ
calculator is for 2x2 contingency tables that separate each subject i
two possibilities. Simply label the rows and columns, then type in th
factors. Learn more about contingency tables (along with when to u

Enter your data

Enter the labels and number of subjects actually observed. Don't

	C NU	CU
Anti PD1	47	29
other	21	5

Which test

- ○ Fisher's exact test
- ● Chi-square
- ○ Chi-square with Yates' correction

P value Tails

- ● Two-tailed (recommended)
- ○ One-tailed

Calculate | Clear The Form

graphpad.com/quick...

AMP | Gmail | Im | Speedtest | Canvas2

GraphPad by Dotmatics

1. Select category | 2. Choose calculator | 3. Enter data

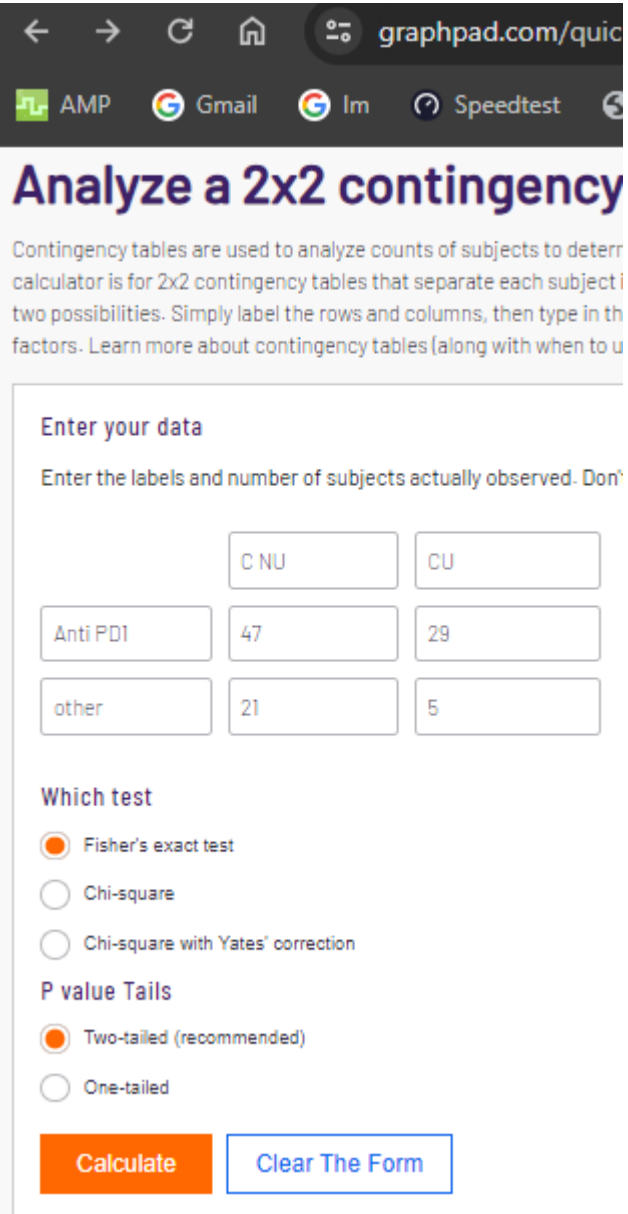
Analyze a 2x2 contingency table

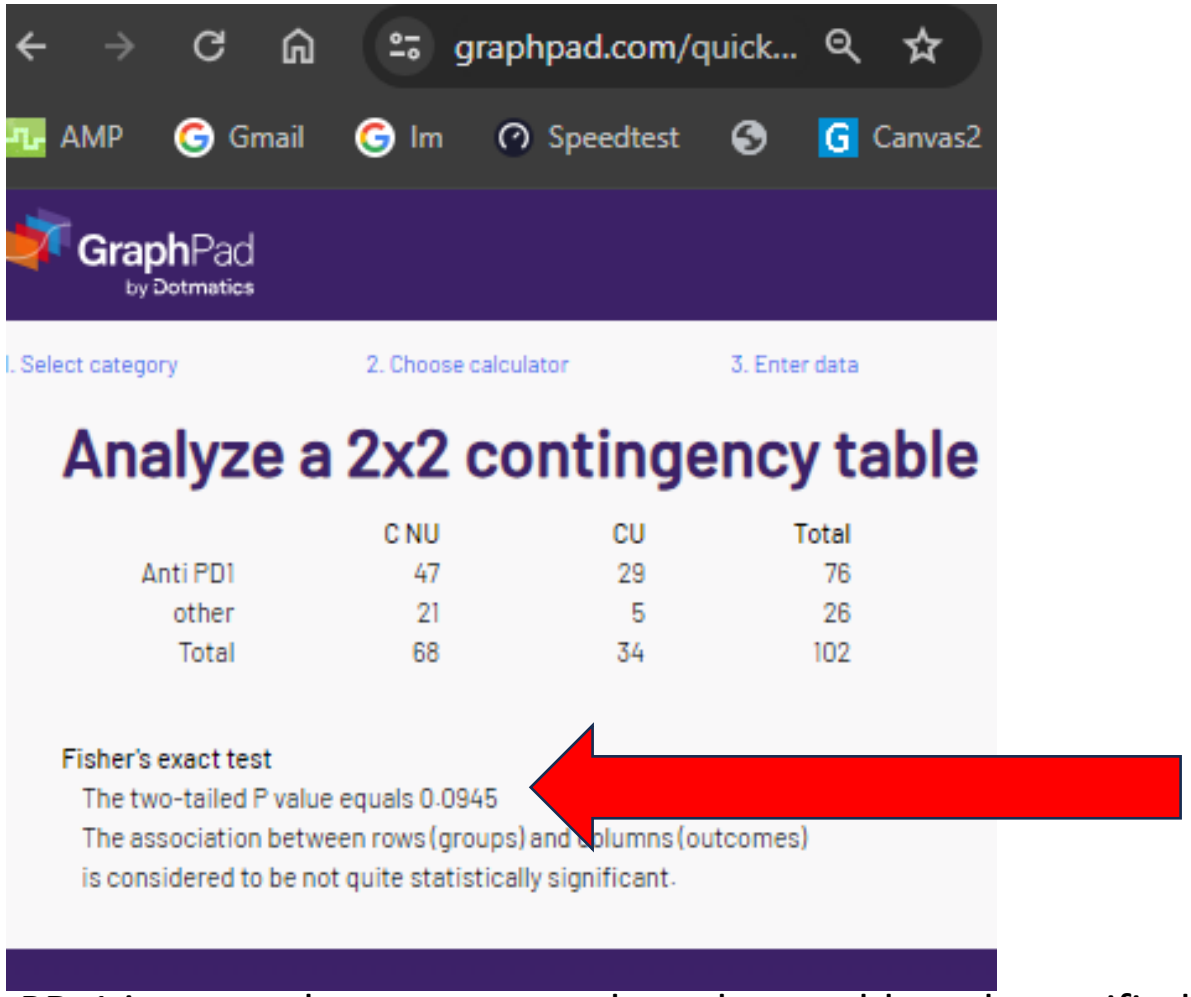
	C NU	CU	Total
Anti PD1	47	29	76
other	21	5	26
Total	68	34	102

Chi-square without Yates correction

Chi squared equals 3.123 with 1 degrees of freedom.
The two-tailed P value equals 0.0772
The association between rows (groups) and columns (out
is considered to be not quite statistically significant.

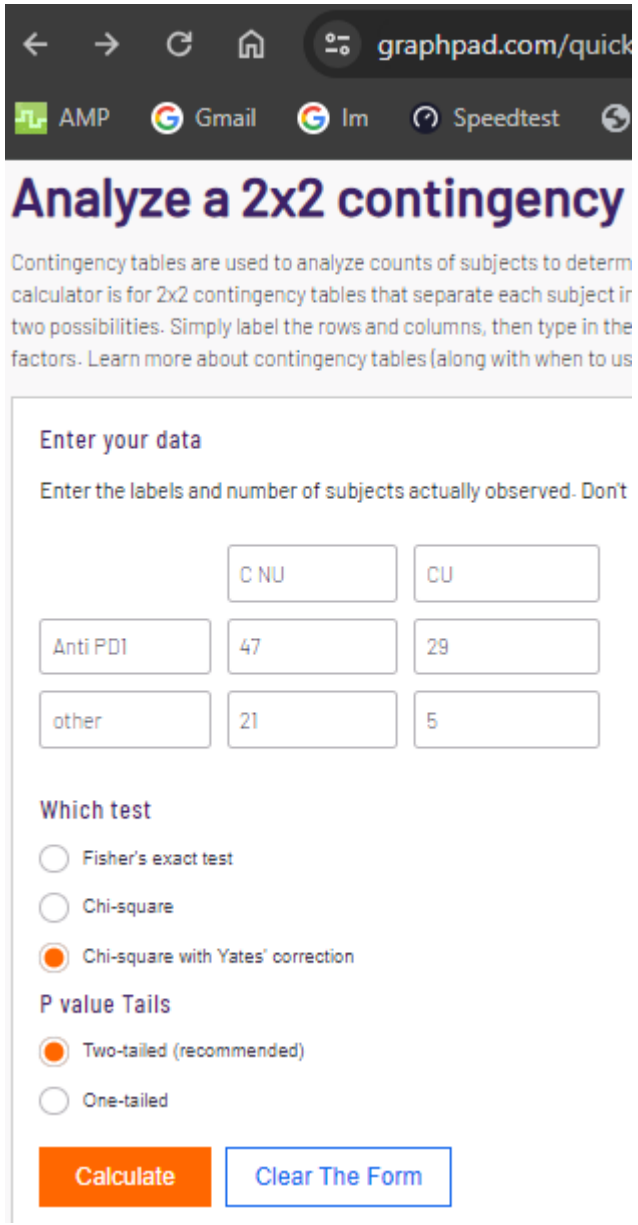
T. “corrected” chi-sq or Fisher’s = .127

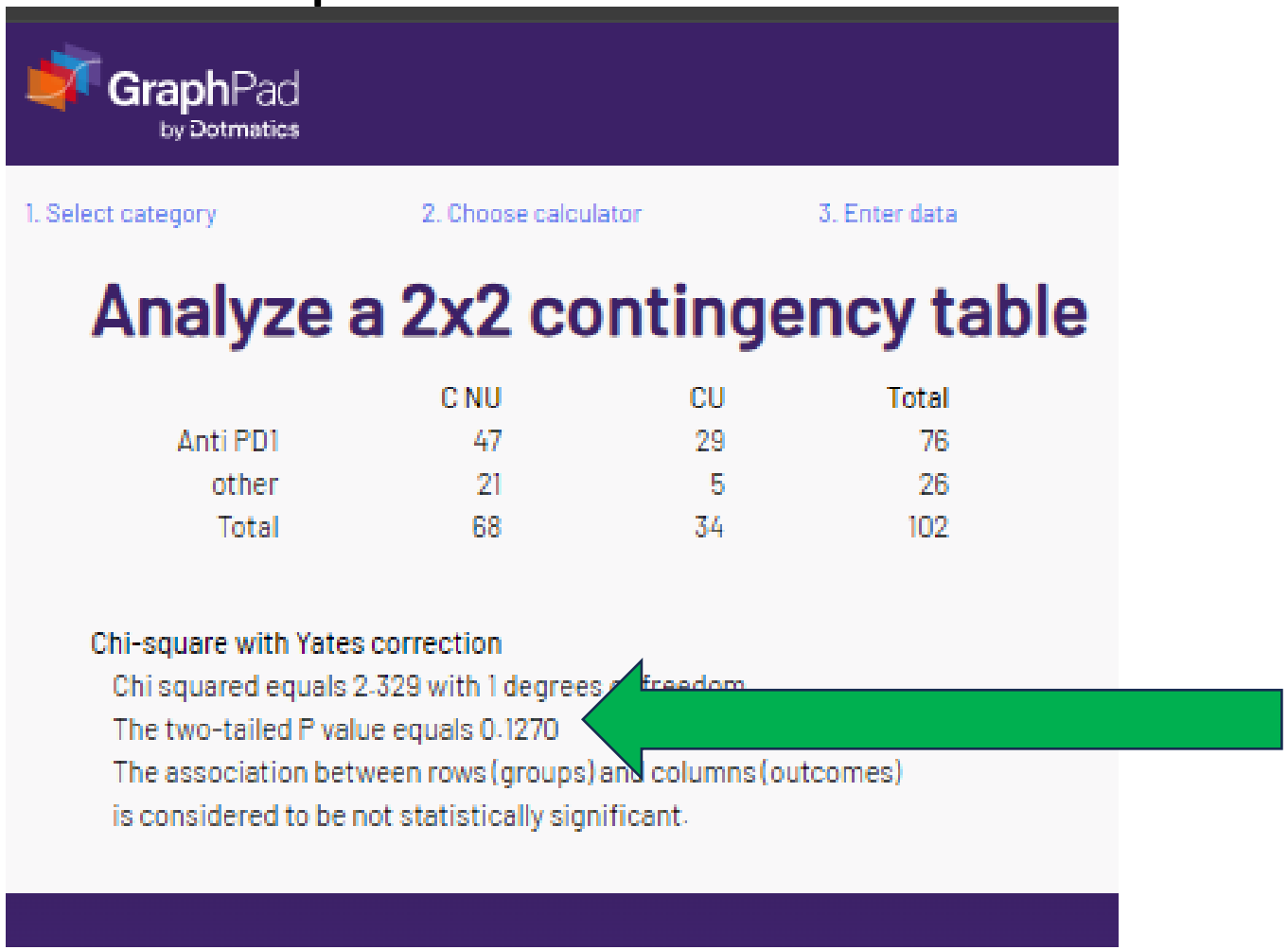




The for PD-1 immunotherapy reported p-value could not be verified with either chi-square or Fisher’s. A “trend” ($p > .05$ but $p < .10$) was identified with both statistics. However, this was not discussed in the manuscript as this near significant difference could change the interpretation of this immunotherapy study.

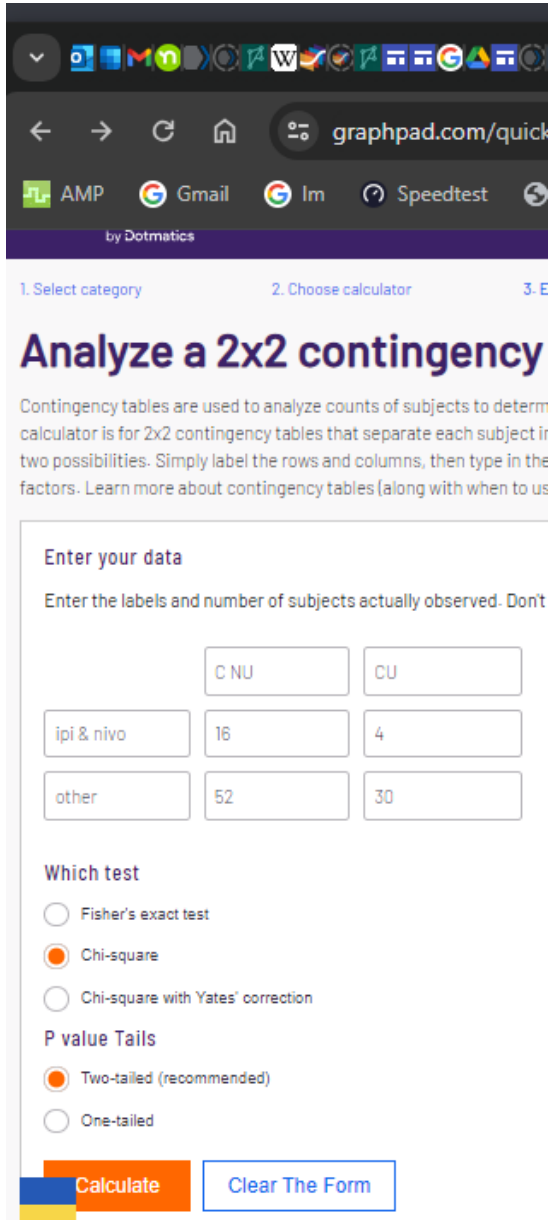
T. “corrected” chi-sq or Fisher’s = .127





The smallest N per cell was 5 so Yates would (arguably) not be used.
However, the p-value was verified (again, with a statistic not listed in the methods section).

U. “corrected” chi-sq or Fisher’s p = .2517



GraphPad by Dotmatics

1. Select category 2. Choose calculator 3. Enter data

Analyze a 2x2 contingency table

	C NU	CU	Total
ipi & nivo	16	4	20
other	52	30	82
Total	68	34	102

Chi-square without Yates correction

Chi squared equals 1.990 with 1 degrees of freedom.

The two-tailed P value equals 0.1583

The association between rows (groups) and columns (ou

is considered to be not statistically significant.

U. “corrected” chi-sq or Fisher’s p = .2517

Analyze a 2x2 contingency

Contingency tables are used to analyze counts of subjects to determ
calculator is for 2x2 contingency tables that separate each subject i
two possibilities. Simply label the rows and columns, then type in th
factors. Learn more about contingency tables (along with when to u

Enter your data

Enter the labels and number of subjects actually observed. Don't

	C NU	CU
ipi & nivo	16	4
other	52	30

Which test

- (●) Fisher's exact test
- ( ) Chi-square
- ( ) Chi-square with Yates' correction

P value Tails

- (●) Two-tailed (recommended)
- ( ) One-tailed

Calculate | Clear The Form

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1. Select category 2. Choose calculator 3. Enter data

Analyze a 2x2 contingency table

	C NU	CU	Total
ipi & nivo	16	4	20
other	52	30	82
Total	68	34	102

Fisher's exact test

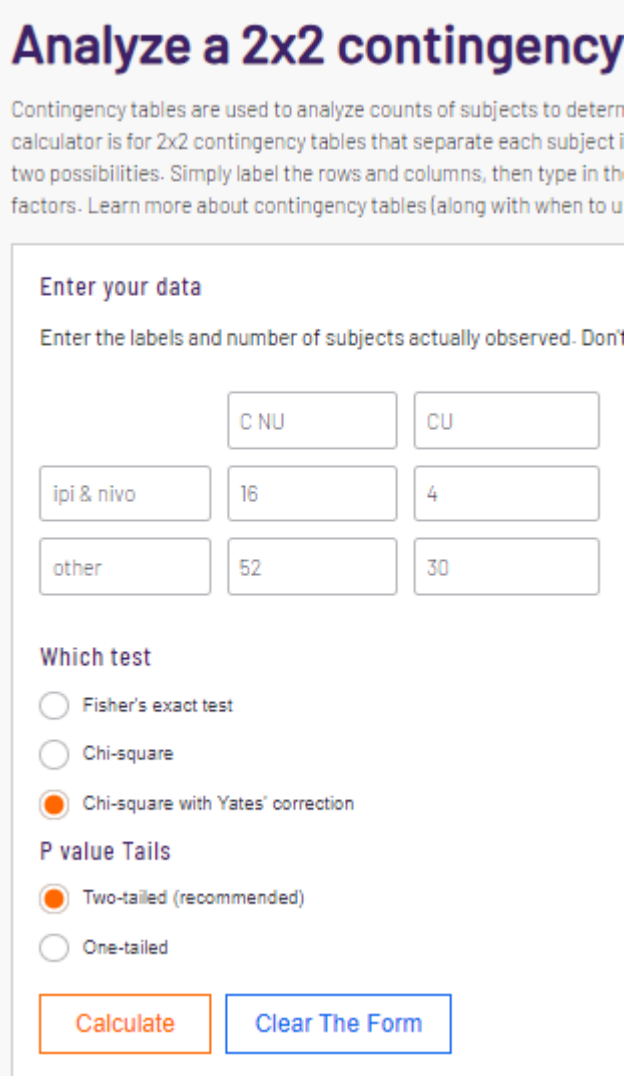
The two-tailed P value equals 0.1934

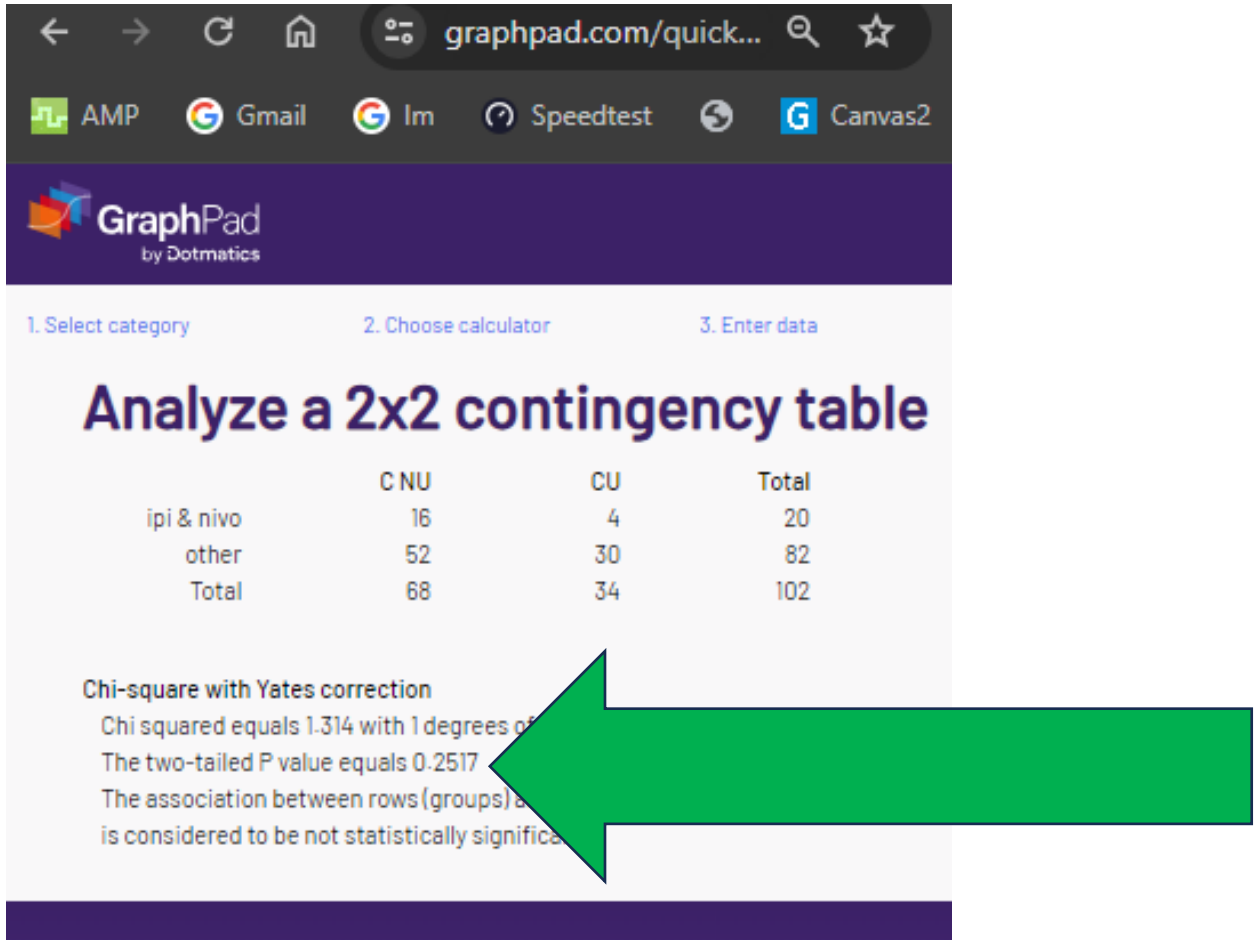
The association between rows (groups) an[illegible] (outcomes)

is considered to be not statistically significant.

The reported p value for ipilimumab & nivolumab could not be verified with either chi-square or Fisher’s.

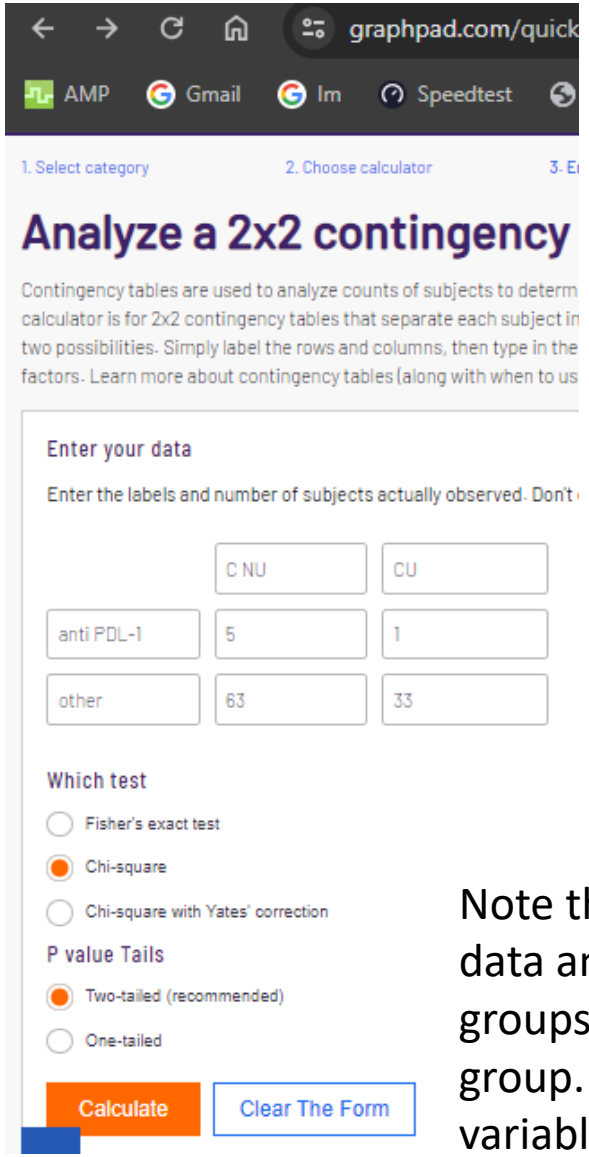
U. “corrected” chi-sq or Fisher’s p = .2517

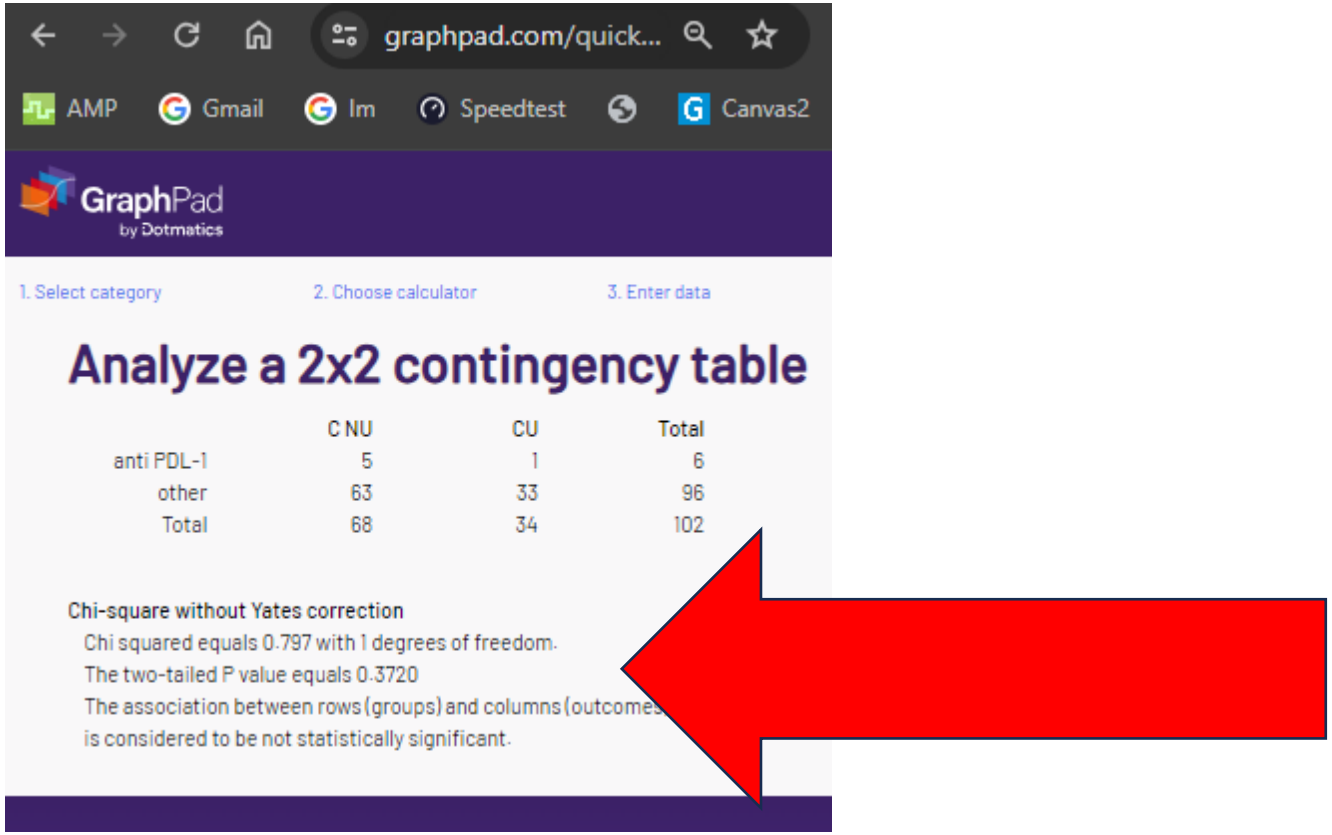




Although not listed in the methods section, due to the small N per cell (4), Yates correction would be appropriate here. The p value is verified.

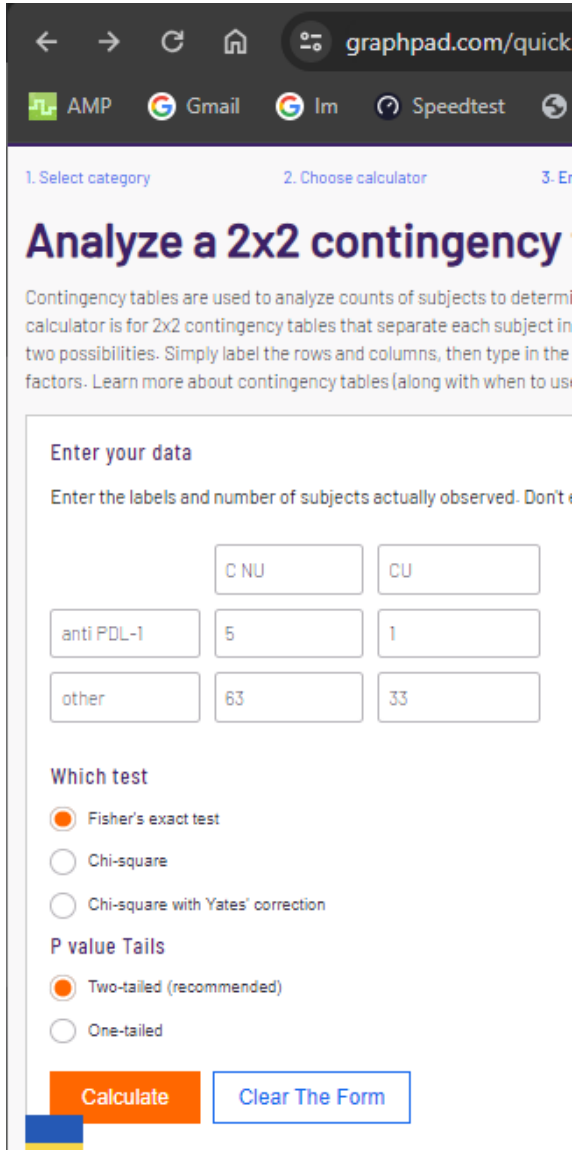
V. “Corrected” chi-sq or Fisher’s p = “1”

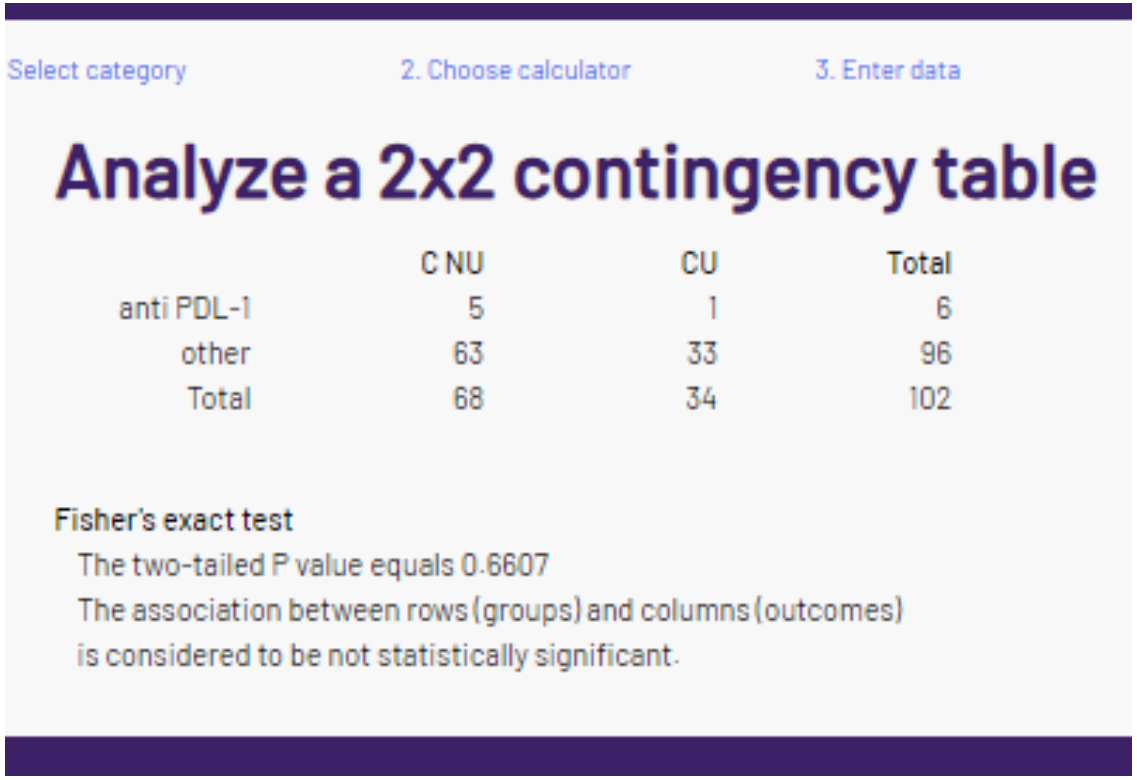




Note that a statistician that has worked with non-parametric data could just eyeball this data and intuitively know that the p value was **not** 1.000. That only happens when the % is equal for both groups. With 5 for 68 total in the CNU group, it would have to be 2.5 (i.e. half) per 34 total in the CU group. As this is an impossible outcome, there is clearly an error in the reporting for this immunotherapy variable.

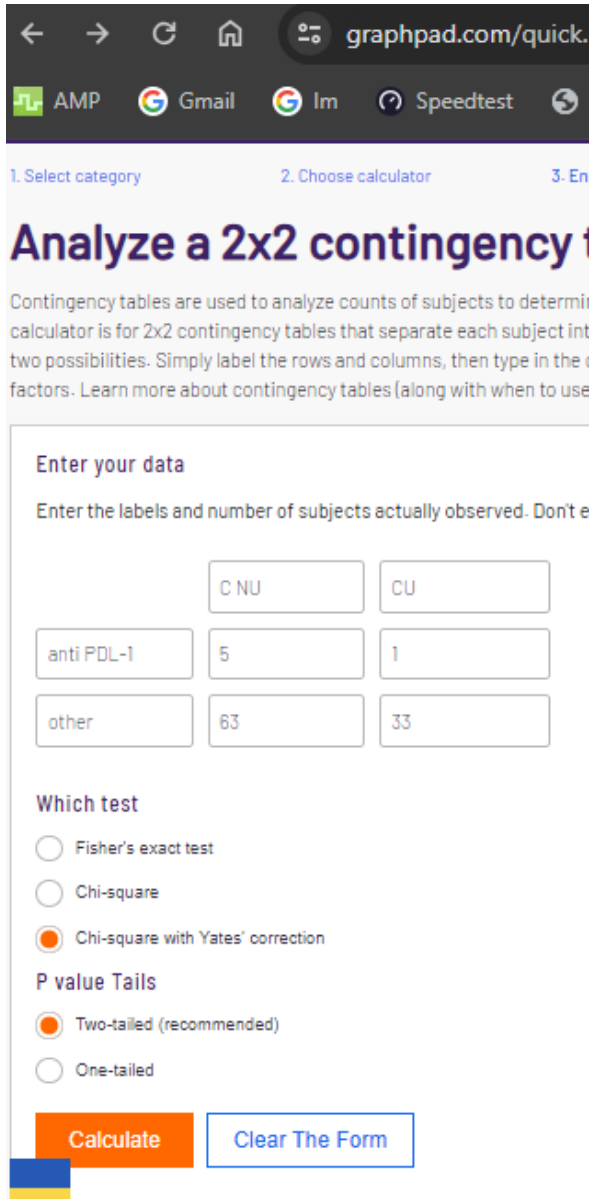
V. “Corrected” chi-sq or Fisher’s p = “1”

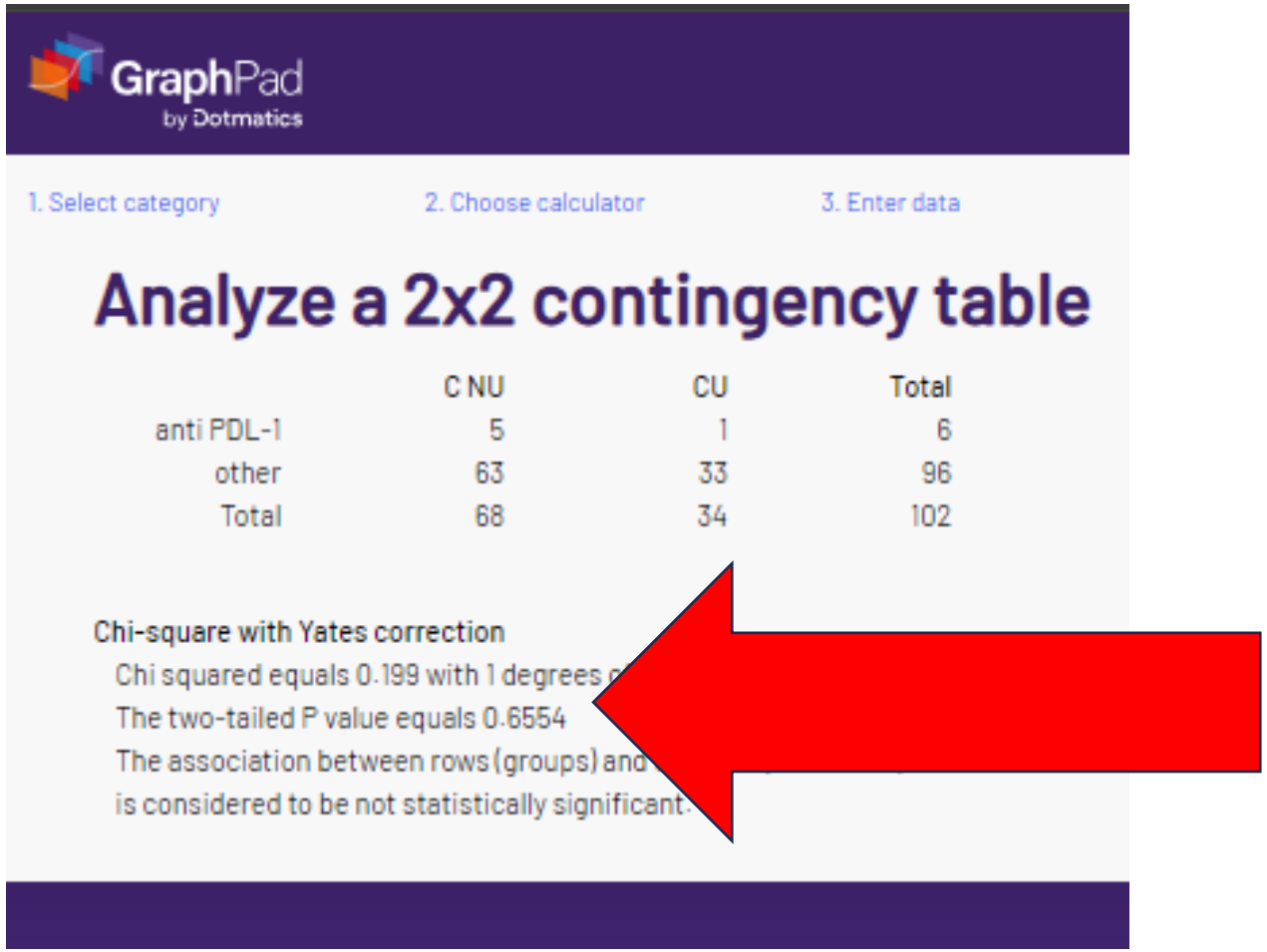




The “corrected” p value for anti-PDL-1 immunotherapy could **not** be verified with either chi-square or Fisher’s.

V. “Corrected” chi-sq or Fisher’s p = “1”





The reported p-value also was **not** verified with Yates.

For further information

These concerns are also described at: https://pubpeer.com/publications/5AFA302155D8AE02603134F556A085?utm_source=Chrome&utm_medium=BrowserExtension&utm_campaign=Chrome

A series of χ^2 tests or Fisher's exact tests (when the assumptions of the parametric χ^2 test were not met) and nonparametric Mann–Whitney U tests were conducted to analyze the differences between patients' characteristics in both groups. Time to tumor progression (TTP) and overall survival (OS) was estimated using the Kaplan-Meier survival curve by group, and the log-rank test was computed to differentiate the survival curves between groups. Hazard ratios and the corresponding 95% CIs based on a Cox proportional hazards regression model were provided for multivariate analyses. We computed 2-tailed p-values, where $p < 0.05$ was considered a statistically significant result. Statistical analyses were performed using the SAS software package version 9.4 (SAS Institute, Cary, NC, USA).

Note 2-tailed p values

Parametric: variables with normal distribution were compared by means of parametric tests, there is no such thing as a "parametric chi-square test"

Summary of Table 2

- 0 of the 2 p values could be replicated despite trying 6 different ways
- 2 of the 12 percentage calculations contain rounding errors

Table 2. Abnormal laboratory tests before immunotherapy (according to local normal ranges).

	Test	Cannabis: Nonusers $n = 68$	Cannabis: Users $n = 34$	p-Value
1	Lymphocytes ≤ 1.5 K/uL—N (%)	35 (51)	23 (67) 67.6=68	0.08
	Blood count WBC ≤ 4.5 K/uL—N (%)	7 (10)	2 (6)	-
	Liver Function			
	Alanine Aminotransferase (ALT) > 45	7 (10)	3 (9)	-
	Aspartate Aminotrasferase (AST) > 35	8 (12)	5 (15)	-
2	Alkaline phosphatase level (ALKP) > 120	13 (19)	11 (32)	0.09
	Renal Function—N (%)			
	Creatinine > 1.17 mL/min	12 (17) 17.6 = 18	3 (9)	-

Two-tailed
Ch-sq=.1199
F=.1412
Y=.1793
Ch-sq=.4590

Chi-sq=.1374
F=.1468
Y=.2157

One-tailed

1: C = .060, F = .0890, Y = .0896, 3: C= .0687, F = .1089, Y = .1079

Analyze a 2x2 contingency

Contingency tables are used to analyze counts of subjects to deterr
calculator is for 2x2 contingency tables that separate each subject i
with two possibilities. Simply label the rows and columns, then type
between the two factors. Learn more about contingency tables (alo
the calculator.

Enter your data

Enter the labels and number of subjects actually observed. Don'

	CNU	CU
L < =1.5	35	23
L>1.5	33	11

Which test

- ○ Fisher's exact test
- ○ Chi-square
- ● Chi-square with Yates' correction

P value Tails

- ● Two-tailed (recommended)
- ○ One-tailed

Calculate | Clear The Form

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1. Select category 2. Choose calculator 3. Enter data

Analyze a 2x2 contingency table

	CNU	CU	Total
L < =1.5	35	23	58
L>1.5	33	11	44
Total	68	34	102

Chi-square with Yates correction

Chi squared equals 1.804 with 1 degrees of freedom.
The two-tailed P value equals 0.1793
The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.

Analyze a 2x2 contingency

Contingency tables are used to analyze counts of subjects to deterr
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P value Tails

- ● Two-tailed (recommended)
- ○ One-tailed

Calculate | Clear The Form

1. Select category 2. Choose calculator 3. Enter data

Analyze a 2x2 contingency table

	CNU	CU	Total
L < =1.5	35	23	58
L>1.5	33	11	44
Total	68	34	102

Chi-square without Yates correction

Chi squared equals 2.418 with 1 degrees of freedom.

The two-tailed P value equals 0.1199

The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.

Analyze a 2x2 contingenc

Contingency tables are used to analyze counts of subjects to de
calculator is for 2x2 contingency tables that separate each subj
with two possibilities. Simply label the rows and columns, then
between the two factors. Learn more about contingency tables
the calculator.

Enter your data

Enter the labels and number of subjects actually observed.

	CNU	CU
L < =1.5	35	23
L>1.5	33	11

Which test

- (●) Fisher's exact test
- ( ) Chi-square
- ( ) Chi-square with Yates' correction

P value Tails

- (●) Two-tailed (recommended)
- ( ) One-tailed

Calculate | Clear The Form

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1. Select category 2. Choose calculator 3. Enter data

Analyze a 2x2 contingency table

	CNU	CU	Total
L < =1.5	35	23	58
L>1.5	33	11	44
Total	68	34	102

Fisher's exact test

The two-tailed P value equals 0.1412

The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.

Analyze a 2x2 contingency

Contingency tables are used to analyze counts of subjects to determi
calculator is for 2x2 contingency tables that separate each subject int
two possibilities. Simply label the rows and columns, then type in the
two factors. Learn more about contingency tables (along with when to

Enter your data

Enter the labels and number of subjects actually observed. Don't e

	CNU	CU
L<=1.5	35	23
L>1.5	33	11

Which test

- ○ Fisher's exact test
- ○ Chi-square
- ● Chi-square with Yates' correction

P value Tails

- ○ Two-tailed (recommended)
- ● One-tailed

Calculate | Clear The Form

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matics

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1. Select category 2. Choose calculator 3. Enter data

Analyze a 2x2 contingency table

	CNU	CU	Total
L<=1.5	35	23	58
L>1.5	33	11	44
Total	68	34	102

Chi-square with Yates correction

Chi squared equals 1.804 with 1 degrees of freedom.
The one-tailed P value equals 0.0896
The association between rows (groups) and columns (outcomes) is considered to be not quite statistically significant.

This p value <u>almost</u> corresponds with that reported in Table 2.

Analyze a 2x2 contingency table

Contingency tables are used to analyze counts of subjects to determine if there is asso
calculator is for 2x2 contingency tables that separate each subject into one of four cate
with two possibilities. Simply label the rows and columns, then type in the counts for ea
between the two factors. Learn more about contingency tables (along with when to use
the calculator.

Enter your data

Enter the labels and number of subjects actually observed. Don't enter proportions.

	CNU	CU
ALKP > 120	13	11
ALKP<=120	55	23

Which test

- ○ Fisher's exact test
- ○ Chi-square
- ● Chi-square with Yates' correction

P value Tails

- ○ Two-tailed (recommended)
- ● One-tailed

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1. Select category 2. Choose calculator 3. Enter data

Analyze a 2x2 contingency table

	CNU	CU	Total
ALKP > 120	13	11	24
ALKP<=120	55	23	78
Total	68	34	102

Chi-square with Yates correction

Chi squared equals 1.532 with 1 degrees of freedom.

The one-tailed P value equals 0.1079

The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.

Analyze a 2x2 contingen

Contingency tables are used to analyze counts of subjects t
actors. This calculator is for 2x2 contingency tables that se
based on two factors, each with two possibilities. Simply lab
for each cell to test the relationship between the two factors
when to use each test) in the description below the calculato

Enter your data

Enter the labels and number of subjects actually observe
means.

	CNU	CU
WBC<=4.5	7	2
WBC>4.5	61	32

Which test

- ○ Fisher's exact test
- ● Chi-square
- ○ Chi-square with Yates' correction

P value Tails

- ● Two-tailed (recommended)
- ○ One-tailed

Calculate | Clear The Form

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1. Select category 2. Choose calculator 3. Enter data 4. Vi

Analyze a 2x2 contingency table

	CNU	CU	Total
WBC<=4.5	7	2	9
WBC>4.5	61	32	93
Total	68	34	102

Chi-square without Yates correction

Chi squared equals 0.548 with 1 degrees of freedom.

The two-tailed P value equals 0.4590

The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.

Analyze a 2x2 contingenc

Contingency tables are used to analyze counts of subjects to de
actors. This calculator is for 2x2 contingency tables that separ
based on two factors, each with two possibilities. Simply label t
or each cell to test the relationship between the two factors. L
when to use each test) in the description below the calculator.

Enter your data

Enter the labels and number of subjects actually observed. I
means.

	CNU	CU
ALKP>120	13	11
ALKP<=120	55	23

Which test

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- ● Chi-square
- ○ Chi-square with Yates' correction

P value Tails

- ● Two-tailed (recommended)
- ○ One-tailed

Calculate | Clear The Form

GraphPad by Dotmatics

1. Select category 2. Choose calculator 3. Enter data 4. Vie

Analyze a 2x2 contingency table

	CNU	CU	Total
ALKP>120	13	11	24
ALKP<=120	55	23	78
Total	68	34	102

Chi-square without Yates correction

Chi squared equals 2.207 with 1 degrees of freedom.

The two-tailed P value equals 0.1374

The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.

Analyze a 2x2 contingen

Contingency tables are used to analyze counts of subjects to
factors. This calculator is for 2x2 contingency tables that sep
based on two factors, each with two possibilities. Simply labe
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	CNU	CU
ALKP>120	13	11
ALKP<=120	55	23

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- ( ) Chi-square
- ( ) Chi-square with Yates' correction

P value Tails

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- ( ) One-tailed

Calculate | Clear The Form

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1. Select category 2. Choose calculator 3. Enter data

Analyze a 2x2 contingency table

	CNU	CU	Total
ALKP>120	13	11	24
ALKP<=120	55	23	78
Total	68	34	102

Fisher's exact test

The two-tailed P value equals 0.1468

The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.

Analyze a 2x2 contingency table

Contingency tables are used to analyze counts of subjects to determine if there is assoc
calculator is for 2x2 contingency tables that separate each subject into one of four categ
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two factors. Learn more about contingency tables (along with when to use each test) in t

Enter your data

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- ○ One-tailed

Calculate | Clear The Form

GraphPad by Dotmatics

Prism Customers Resources Support

1. Select category 2. Choose calculator 3. Enter data

Analyze a 2x2 contingency table

	CNU	CU	Total
ALKP>120	13	11	24
ALKP<=120	55	23	78
Total	68	34	102

Chi-square with Yates correction

Chi squared equals 1.532 with 1 degrees of freedom.
The two-tailed P value equals 0.2157
The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.