

χ^2 Test for Independence, in Excel

Is there a difference between men and women's attitudes to the Danish tax rate?

A study showed the following results:

observed number

What do you think of the Danish tax rate?	male	woman	Total
too high	69	62	131
suitably	103	112	215
too low	15	12	27
Total	187	186	373

H_0 (Null Hypothesis): There's no difference between men and women's attitudes to the tax rate.

- Calculate a table with the expected number under the Null Hypothesis.
- Calculate the critical value k , the test χ^2 , and the probability p .
- Determine on the level of significance 5%, whether the Null Hypothesis must be rejected.

a) Expected number

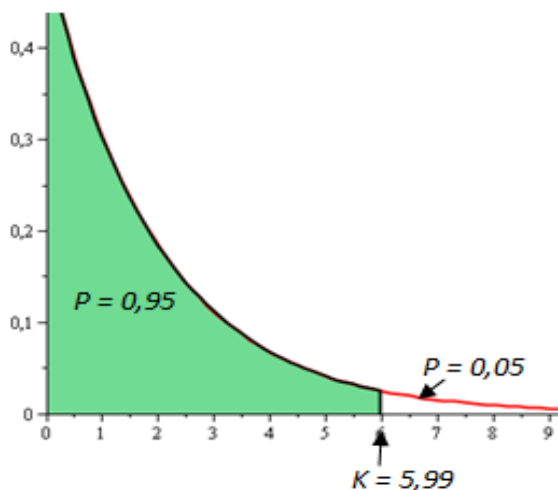
What do you think of the Danish tax rate	male	woman	Total
too high	65.68	65.32	131
suitably	107.79	107.21	215
too low	13.54	13.46	27
Total	187	186	373

The expected number of men who believes, that the tax rate is too high - without regard to gender: $131/373 = 0.3512 = 35.12\%$
 The expected number: $0.3512 \cdot 187 = 65.68$. etc.

b)

level of significance	0.05	
Numbers of rows:	3	
Number of columns	2	
degrees of freedom	2	
k - value:	5.991	$=\text{CHIINV}(0,05;2)$
χ^2 - test:	1.081	$=\text{CHIINV}(0,5823;2)$
p - value:	0.582	$=\text{CHITEST}(B10:C12;B23:C25)$

- c) We may accept the Null Hypothesis, because $p = 58.2\%$, is greater than the tests 0.05 significance level for the distribution. And $\chi^2 = 1.08$, is less than the significance level $k = 5.99$.
 ie. we can not reject the null hypothesis: there's no difference between men and women's attitudes to the tax rate.



In this diagram:
 Swap the decimal comma to the english decimal dot.

The green area is the acceptance area.