

a) First calculate the expected numbers

		Type		total
		maligant	maligant	
Seprase immunohistochemistry Score	0	21.4	2.6	24
	1	20.5	2.5	23
	2	20.5	2.5	23
	3	11.6	1.4	13
	Σ	74	9	83

Then calculate the Chi –square value:

$$\sum \frac{(O - E)^2}{E} = \frac{(17 - 21,4)^2}{21,4} + \frac{(7 - 2,6)^2}{2,6} + \frac{(22 - 20,5)^2}{20,5} + \frac{(1 - 2,5)^2}{2,5} + \frac{(22 - 20,5)^2}{20,5} + \frac{(1 - 2,5)^2}{2,5} + \frac{(13 - 11,6)^2}{11,6} + \frac{(0 - 1,4)^2}{1,4} = 11,9$$

There are 4 degrees of freedom ($\#kolonner-1$)*($\#rækker-1$) and a look in the table will show that $0.01 < p < 0.001$.

The researchers concluded that there was a significant association between tumor type and Seprase score.

- b) The use of Chi-square is not optimal. 50% of the *expected* values are below 5.
- c) They should have used Fishers exact test or collapsed some of the groups.