

# Re: chi-squared test. hypothesis confusion

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  - *Date:* 23 Dec 2005 07:21:22 -0800
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This is a common question when starting to do hypothesis testing. Your tests H0 is smoking and allergy are statistically independent, and Ha is smoking and allergy are not independent. From your notes you have a decision rule associated with this chisq test. You reject H0 if your test statistic  $\chi^2 \geq \chi^2_{\alpha}$  (where  $\chi^2_{\alpha}$ ,  $(r-1)(k-1)$  is found in a table or generated from a program depending on your level of  $\alpha$  and  $r$  and  $k$ ). Simply find the  $\chi^2_{\alpha}$  value from a table (in any stat book), then calculate the  $\chi^2$  statistic using your data. Then follow the rule ... if  $\chi^2 \geq \chi^2_{\alpha}$  - reject H0, i.e. smoking and allergy are NOT independent, if  $\chi^2 < \chi^2_{\alpha}$  you don't accept Ha, you "fail to reject H0", i.e. smoking and allergy are independent. It's as easy as that. However, make sure your data satisfies any assumptions of the test. This particular test has very flexible assumptions, in that you only need your observations to be independent of each other and that each cell of your 2x2 table is greater than 0 (preferably bigger than 5, otherwise you could get skewed results).  
Hope that helps.

Eric B.

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- *Follow-Ups:*
  - ◆ [\*\*Re: chi-squared test. hypothesis confusion\*\*](#)  
◇ *From:* Bruce Weaver
- *References:*
  - ◆ [\*\*chi-squared test. hypothesis confusion\*\*](#)  
◇ *From:* mikeeria
- Prev by Date: [\*\*chi-squared test. hypothesis confusion\*\*](#)
- Next by Date: [\*\*Re: chi-squared test. hypothesis confusion\*\*](#)
- Previous by thread: [\*\*chi-squared test. hypothesis confusion\*\*](#)
- Next by thread: [\*\*Re: chi-squared test. hypothesis confusion\*\*](#)
- Index(es):
  - ◆ [\*\*Date\*\*](#)

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◆ *Thread*