LETTER TO THE EDITOR

Chi squared test versus Fisher's exact test

A recently published article by Chan et al[1] illustrates the problem of using the Chi squared test. If there are more than 20% of cells with an expected value of less than 5 in a contingency table, we should use Fisher's exact test. From Table 3 of their paper, we find some cells with an expected value of less than 5. For example, for the "treatment on health problem", there is a cell with an actual value of 4, its expected value is 2.09. Similar conditions occurred in the table for "Used health hotline before". In these cases, Fisher's exact test should be used instead of the Chi squared test. The former is a more accurate test, which directly calculates the probability of the distribution of the sample appearing in the table by chance. Previously, Fisher's exact test was not commonly used as the calculation procedure was tedious and complicated.[2] The problem has now been overcome by computers.

Interestingly, when P values in Chan et al's paper were computed, I observed that the value in Table 3 was the result obtained using Fisher's exact test and not the Chi squared test. The authors are absolutely correct to compute the P value by Fisher's exact test, but this should be stated as such instead of calling it a Chi squared test P value. The two tests are different. If in doubt about whether the sample size is large enough for the Chi squared test to be valid, use Fisher's exact test.[3]

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