Chi−square for binomial samples

Source: http://sci.tech−archive.net/Archive/sci.stat.math/2006−06/msg00000.html

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- *Date*: Wed, 31 May 2006 18:09:58 −0400

Hello,

I looked in many places for this info and did not find it. Perhaps my Googling skills are not up to par.

Scenario:

N experimenters take samples from a common population, effectively infinite, BUT these samples are of various sizes. They each look for a given (fixed) attribute of interest and record their frequency of success.

Were their samples all of the same size, then every statistics book ever written would discuss how to compute the associated chi−square statistic. Moreover, computing a maximum−likelihood value for p is still straightforward since every term in the log−likelihood is well−defined.

Question:

Is there an accepted method to compute chi−square under the conditions stated −− where p is assumed known but sample size is variable? Is this even a sensible question?

The analogous question could be asked wrt the beta−binomial distribution as well. There, the scenario described is, in fact, the norm. The question could be asked again, a fortiori, wrt the hypergeometric distribution (two parameters nominally fixed).

TIA for any help.

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Mike McLaughlin
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