

Re: Multinomial approximation to Poisson ??

Source: <http://sci.tech-archive.net/Archive/sci.stat.math/2006-09/msg00027.html>

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 - *Date:* Thu, 31 Aug 2006 22:32:37 -0500
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"Reef Fish" <Large_Nassau_GrOuper@xxxxxxxxxx> wrote in
news:1157053711.591415.87030@xx:

Nag wrote:

I am trying to approximate a Poisson (L) with a multinomial (k+1 states: 0,1,...,k) distribution, n trials; i.e. $n(0) + n(1) + n(2) + \dots + n(k) = n$.

Given L and n, how does one determine the probabilities of the (k+1) states?

Any references, suggestions?

Several!

The first is my 1992 paper in the American Statistician, "Just Say NO to the use of Tables for the Binomial and Other Discrete Distributions", pointing to two other reference that has the relation of the Poisson to the Chi-Square distribution. >
There is NO NEED for any appromation to ANY Poisson probability! (Given the widely available statistical packages that can calculate the cdf of the chi-square distribution.

This is the excerpt from a recent post of mine:

The 1992 paper only high-lighted the Binomial-F relation and pointed to the earlier results I extracted out of Pratt's 1968 paper into one little section in my 1978 approximation paper in JASA.

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exact results can be quickly computed, but the mathematical identities (5.1) – (5.6) in that paper are the ones that make some discrete distribution tables obsolete.

the relation between the Poisson tail and Chi-square tail should be useful.

Note especially the last comment above.

Lecture time? Log-linear models are often used to summarize and draw inferences regarding multinomial problems. Poisson regression is a subset of those methods. The GLM formulation supports inferences by comparing deviances from nested models to chi-square critical values. I am surmising that you might do the group a service by tying some of those concepts together with a discussion of the relations between those distributions.

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David Winsemius.

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