

两因素随机效应模型下平均暴露量的检验

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摘要 通过两因素随机效应模型来研究某一工厂的平均暴露(exposure)水平.

利用广义检验变量和广义枢轴量分别给出了相关假设检验问题的广义 p -值.证明了由广义 p -

值所确定的拒绝域的概率在原假设下取上确界等于在原假设和备择假设的公共边界上取上确界,

且进一步证明了当参数趋于原假设和备择假设的公共边界的边界时,犯第一类错误的概率趋于名义显著性水平,并在公共边界的内部做了模拟研究.结果表明,用广义 p -值的方法来解决此类问题可得到令人满意的结果.

关键词 [两因素随机效应模型](#) [平均暴露量](#) [广义枢轴量](#) [广义 \$p\$ -值](#) [频率性质](#)

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ASSESSING OCCUPATIONAL EXPOSURE VIA THE TWO-WAY RANDOM EFFECTS MODEL

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Abstract This article considers a two-way random effects model for studying the mean exposure level of a factory. Hypothesis testing for the relevant parameters of interest are proposed. The methods are based on the generalized p -values approach. We prove that the supremum of the probability of rejection region based on generalized p -value under null hypothesis equals to that on the bound of null hypothesis and alternative hypothesis. Moreover, we prove that the Type I error rates tend to nominal significance level α when the relevant parameters tend to the bound of the common bound of null hypothesis and alternative hypothesis. The sizes of the test are evaluated numerically when the relevant parameters are within the bound of null hypothesis and alternative hypothesis. The numerical studies show that the proposed inferential procedures are satisfactory even for small samples.

Key words [Two-way random effect model](#) [mean exposure measurement](#) [generalized](#)

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