Epidémiol. santé anim., 1997, 31-32

COMPARISON OF 3 MULTILEVEL PROGRAMS FOR BINARY OUTCOME : LEPTOSPIROSIS IN HORSES

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Plusieurs logiciels statistiques ont été récemment développés pour faciliter l'analyse des données catégorielles hiérarchiques. Le principe général des méthodes statistiques utilisées suppose que les niveaux supérieurs (étable par exemple) sont un échantillon de l'ensemble des niveaux possibles (étables, troupeaux, lots) et distribués selon une loi normale. L'analyse tient compte de ces différents niveaux en pondérant sur les variances intra et inter niveaux (étables par exemple). Nous avons comparé 3 logiciels sur leur approche, types de modèles ajustés, la facilité de rentrer et manipuler les données. Les 3 logiciels sont : EGRET, MIXOR et MLN. Nous les avons testés sur des données recueillies en vue d'identifier les facteurs de risque de la leptospirose équine dans l'Etat de New York.

Many data in veterinary epidemiologic studies on diseases are hierarchically structured in a sense that it entail collection of binary response on multiple levels. An example of a study with hierarchical data is the investigation of the risk factors associated with the likelihood of leptospirosis in horses. The hierarchy arise because the data on disease status and risk factors are collected on horses which are housed in stables. The horses represent a lower or micro-level and the stables represent a higher or macro-level. There are several examples of such hierarchal data in the veterinary literature: cows in herds; sheep in flocks; puppies in clinics; chickens in flocks.

Several software has been developed to aid in the analysis of such hierarchal data. The general analytical principle behind these software revolves around the assumption that the higher levels (stable) are considered as a random sample from all possible levels (stables, herds, flocks) with approximately normally distributed effects. Data collected from these hierarchal levels are combined by a simple weighing of the variances within and between levels (stables).

We compared three statistical software in terms of their design philosophy, type of models that can be fitted, data setup and manipulation, and ease of use. The programs considered were: EGRET, MIXOR, and MLN. These three programs were used to analyze a hierarchal data collected for the purpose of identifying factors associated with the risk of equine leptospirosis in horses in New York state.

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