

**SLE and psychiatric morbidity**

SIR: I read with interest the study of Lim *et al* (*Journal*, October 1991, 159, 520–523). They reported a higher psychiatric morbidity among systemic lupus erythematosus (SLE) patients in Singapore compared with the controls and with SLE patients in London in another similar study by Lim *et al* (1988). However, the results must be interpreted with caution.

Firstly, the authors did not match the control group for age. As a result, the SLE group is significantly younger than the control. The observed difference may be compounded by the age factor. Younger patients facing chronic debilitating illness may suffer a greater psychiatric morbidity.

Secondly, selection of patients who speak English would have resulted in sampling a particular stratum of patients. In Singapore, most of the Chinese population speak Mandarin or one of the Southern Chinese dialects. The criterion would have excluded older and less-educated patients. This sample is therefore not representative of all SLE patients in Singapore. The authors may consider using a Chinese version of questionnaires and investigators well-versed in Chinese.

Thirdly, statistical computation using data provided by the authors shows that the difference in psychiatric morbidity between Singapore and London SLE patients is not statistically significant ( $\chi^2 = 1.228$ ,  $P > 0.05$ , 1 d.f.).

LIM, L., RON, M. A., *et al* (1988) Psychiatric and neurological manifestation in SLE. *Quarterly Journal of Medicine* (New Series 66), 249, 27–38.

ALTMAN, D. G., *et al* (1983) Statistical guidelines for contributors to medical journals. *British Medical Journal*, 286, 1489–1493.

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**Disaster survivors**

SIR: Joseph *et al* (*Journal*, October 1991, 159, 542–546) describe causal attributions and psychiatric symptoms in survivors of the Herald of Free Enterprise disaster. The study is interesting for its methods as well as its field of inquiry.

Obvious methodological problems are the small number of subjects, the selection of subjects, the exclusion of some from analysis after selection, the use of legal statements as measures of personal attributes, the use of correlation when regression analysis would be more informative and the assumption that

correlation implies causation. Parametric statistical methods, which assume normal probability distributions, have been used for data which are clearly skewed (GHQ-30 and BDI scores: the mean is less than twice the standard deviation).

Further problems arise from the way in which the authors have processed their data to produce ratings for internality and controllability. They start with *nominal* data (e.g. the categories 'internal' 'external' and 'both internal and external') which they arbitrarily convert to *ordinal* data (e.g. categories '1', '2' and '1.5'). This is then processed to give *discrete* (*discontinuous*) numerical data (by adding together and taking the mean) which is analysed by methods appropriate only to *continuous numerical* data (Pearson's method of correlation).

Taking the internality score as an example, the total score for each subject will follow a binomial distribution. When a 'mean' is calculated, the distribution is scaled down to fit between the numbers 1 and 2. For example, with two 'negative-event' statements the only values that the internality rating can take are: 1, 1.5, and 2. For four statements the values are: 1, 1.25, 1.5, 1.75 and 2. The rating is not a continuous variable but can only have discrete numerical values.

Not only does this invalidate the method of analysis, but there is also a further difficulty. Where there is a small number of reported 'negative-events' a change in attribution of one event will have a very large effect on the internality rating. With a large number of reported events, a single change of attribution will have only a small effect on the rating. For example, with two events, a single change of attribution will cause the internality score to change by 0.5 but for ten events it will only change by 0.1.

This would seem to invalidate non-parametric methods of analysis such as Spearman's rank correlation coefficient. Small changes in attribution score would cause large changes in rank for some observations.

When the overall internality or controllability rating is near to one of its extreme values, subjects with a low number of reported 'negative-events' will have a highly skewed distribution of rating values. Suppose that there is an overall probability of 0.08 of attributing a 'negative event' to the category 'uncontrollable'. (This is the overall probability given in the paper.) Then, by the binomial theorem, there is a probability of 0.15 of getting a final controllability score of 1.5 or greater when two 'negative-events' are reported. There is only a probability of 0.0012 of getting a score in this range when seven events are reported. When eight or more events are reported the probability is negligible.