

## **Confidence intervals and error margins for the field normalised citation rate**

Ulf Kronman and Staffan Karlsson, the Swedish Research Council

In some instances it is considered as a rule of thumb that citation based indicators should not be calculated for samples smaller than fifty publications; averages based on smaller samples are considered unreliable. On the other hand, citation rates calculated for groups with more than fifty publications is usually presented without any indication of its confidence interval. We here postulate that it can not be possible that the interpretation of citation statistics evolves from being "too low" to "unproblematic" by adding a few publications, and try to calculate error margins valid for any number of publications analysed.

We used time series of annual mean citation rates for groups of different sizes and studied the distribution of the yearly variations. We found that the margin of error based on a 95 percent confidence level for the normalized citation rate is strongly correlated with the number of publications analysed. Our results indicate that an analysis of the field normalised citation rate for 1000 publications has an error margin of  $\pm 0.06$  and an analysis of 100 publications has an error margin of  $\pm 0.15$ .