

## What does *The Journal of Rheumatology* look for in your statistical data?



*Dr. Cynthia S. Crowson, PhD*  
*Associate Editor, Statistics*

I joined the Editorial Board of *The Journal of Rheumatology* in 2019. I'm a statistician at the Mayo Clinic in Rochester, Minnesota, where I have worked for over 30 years. My work has primarily involved analyzing data for the Division of Rheumatology, so I know a lot about rheumatic diseases and the statistical methods commonly used to analyze data for rheumatology studies.

*The Journal of Rheumatology* has high standards, and it's my job as an Associate Editor to help ensure that the articles published in *The Journal* have utilized appropriate statistical methods.

Here are a few common errors that you should avoid when submitting manuscripts to *The Journal*:

- For basic science studies, we see a lot of papers that include bar plots with standard error bars. These plots should be avoided because they can be misleading, particularly when the sample size is small. Dot plots displaying the raw data points are preferred.
- For time-to-event data, be sure to use appropriate methods designed for use with time-to-event data. Methods for analyzing binary outcomes, such as logistic regression models, are not appropriate for analysis of time-to-event data.

Avoid tables with columns for those without and those with an event when the length of follow-up varies for different study subjects. These tables often include two-sample tests that inappropriately analyze the event and non-event groups like a binary outcome. If the follow-up is not the same for all study subjects, a patient in the non-event group with a short follow-up might later develop an event if followed longer.

- When fitting a multivariable model, carefully consider the number of adjustors along with the sample size. Avoid overfitting by ensuring there are at least 10 events per variable in the model or using penalized regression methods.

Sound statistical methods can often mean the difference between acceptance and multiple revisions, or even rejection. Keeping these key points in mind will give your research a better chance to be published, recognized, and cited.

We welcome your manuscript submissions to *The Journal of Rheumatology* and hope that we can publish your research findings in the future.

