

Censoring in survival analysis: Potential for bias

Sir,

We read with interest the article by Singh and Mukhopadhyay^[1] on survival analysis. We commend the authors for simplifying a complex topic and for their in-depth explanation of the principles of survival analysis. However, the authors have failed to adequately emphasize one of the most important assumptions of censoring – which is that the censored patients are considered to have survival prospects similar to the participants who continued to be followed.^[2]

Censoring in survival analysis should be “non-informative,” i.e. participants who drop out of the study should do so due to reasons unrelated to the study. Informative censoring occurs when participants are lost to follow-up due to reasons related to the study, e.g. in a study comparing disease-free survival after two treatments for cancer, the control arm may be ineffective, leading to more recurrences and patients becoming too sick to follow-up. On the other hand, patients on the intervention arm may be completely cured by an effective treatment and may no longer feel the need to follow-up. If these participants are routinely censored, the true treatment effect will not be picked up and the results of the study will be biased. Disease-free survival rates would be based on the patients who continued to be followed-up in the study, and would be overestimated for the control arm and underestimated for the treatment arm.

Several methods have been described to deal with the problem of informative censoring. These include imputation techniques for missing data, sensitivity analyses to mimic best and worst-case scenarios and use of the drop-out event as a study end-point.^[3] For unbiased analysis of survival curves, it is essential that censoring due to loss to follow-up should be minimal and truly “non-informative.” Failure to understand these aspects of survival analysis could lead to grossly erroneous results from perfectly well-conducted studies.

Priya Ranganathan, Pramesh C. S.¹

Departments of Anaesthesiology and ¹Surgical Oncology, Tata Memorial Hospital, Parel, Mumbai - 400 012, India

Address for correspondence:

Dr. Priya Ranganathan,
Department of Anaesthesiology, Tata Memorial Hospital,
Parel, Mumbai - 400 012, India.

E-mail: drpriyaranganathan@gmail.com

REFERENCES

1. Singh R, Mukhopadhyay K. Survival analysis in clinical trials: Basics and must-know areas. *Perspect Clin Res* 2011;2:145-8.
2. Bland JM, Altman DG. Survival probabilities (the KaplanMeier method). *BMJ* 1998;317:1572.
3. Shih W. Problems in dealing with missing data and informative censoring in clinical trials. *Curr Control Trials Cardiovasc Med* 2002;3:4.

Access this article online	
Quick Response Code: 	Website: www.picronline.org
	DOI: 10.4103/2229-3485.92307