



CPS Paper

Cause-specific incidence or cause-specific hazard, that is the question.

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Brief Description

Competing risk model

Abstract

Fine-Gray hazard [5] have been widely used in competing risk trials to directly assess the effect of a covariate on the cause-specific incidence. However, we were concerned if cause-specific incidences do not show treatment effects properly, Fine-Gray hazards should result in biased estimates of treatment effects. The cause-specific incidence is affected by failures of competing causes as well as treatment effects. Thus, this study examines associations of treatment effects and cause-specific incidences in competing risk trials. On the other hand, recent studies found unexpected effects of censors on the Fine-Gray model analysis. For instance, the estimation of the censoring distribution can affect the accuracy of an analysis using Fine-Gray hazard or censoring complicates estimation in the Fine-Gray hazard. These warnings were based on observed phenomena but the root cause of the unexpected phenomena caused by censoring has not been clarified. This study numerically examines the dependency of Fine-Gray hazard on the distribution of censoring.

Figures/Tables

Fig 1

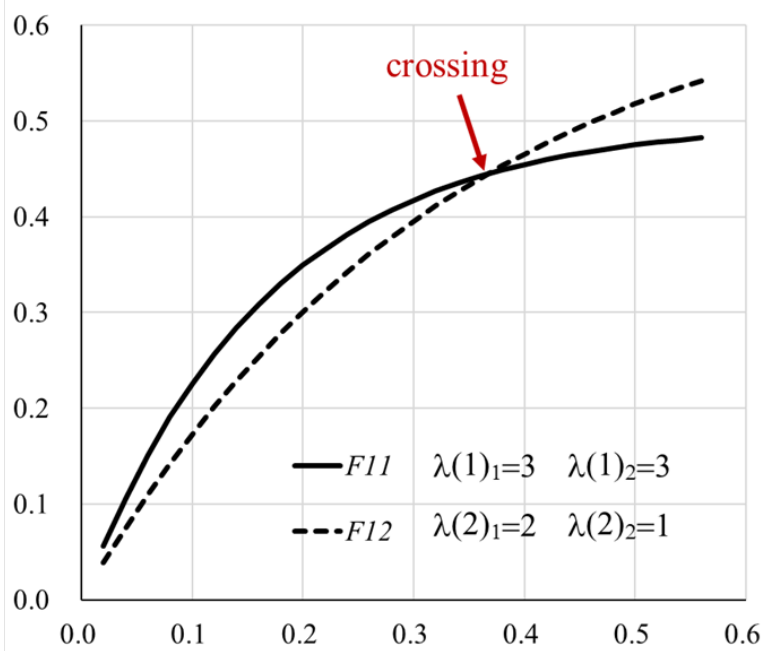


Fig 1. Gray's example: Cumulative incidences cross each other, despite their hazards are constant.

Fig 2

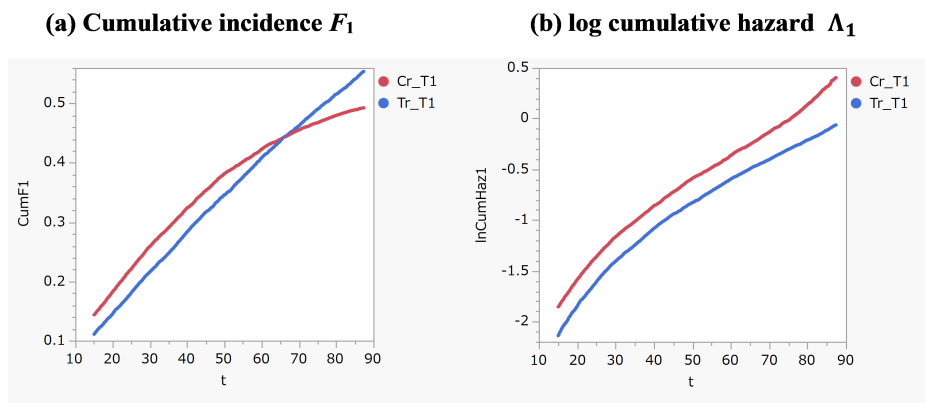


Fig 2. (a) Cumulative incidences are crossing and fail to represent life-prolonging effect properly, (b) log cumulative hazards represent treatment effect properly.

Fig 3

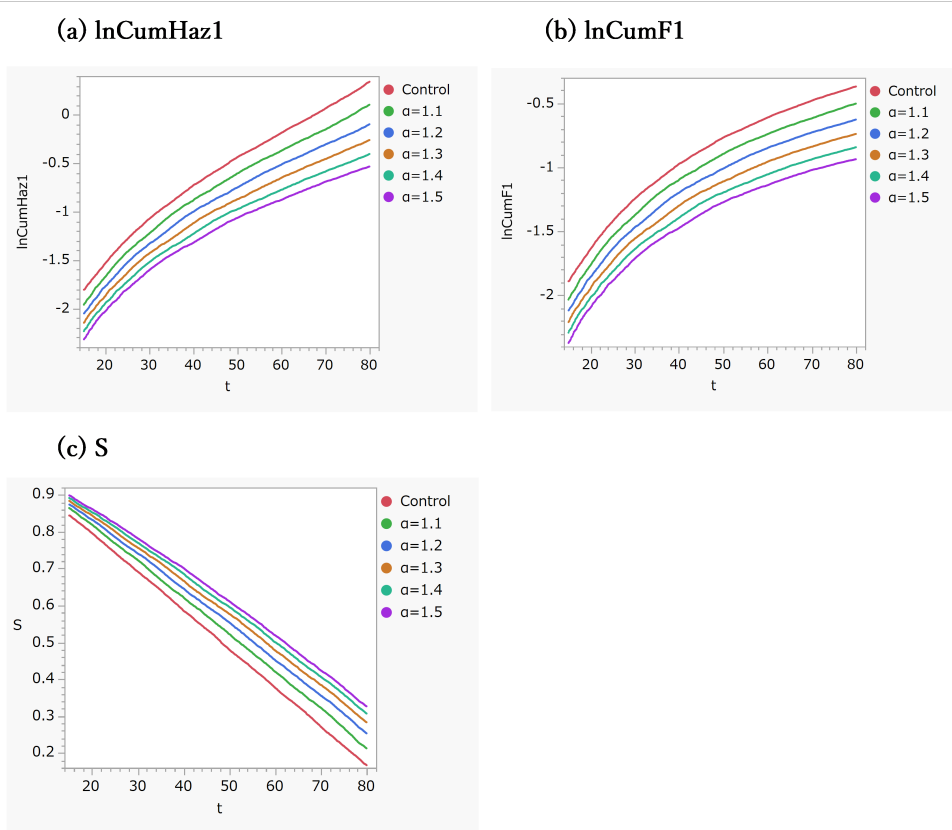


Fig 3. (a) log Cumulative hazard, (b) log cumulative incidence, and (c) Overall survival rate by α .

Fig 4

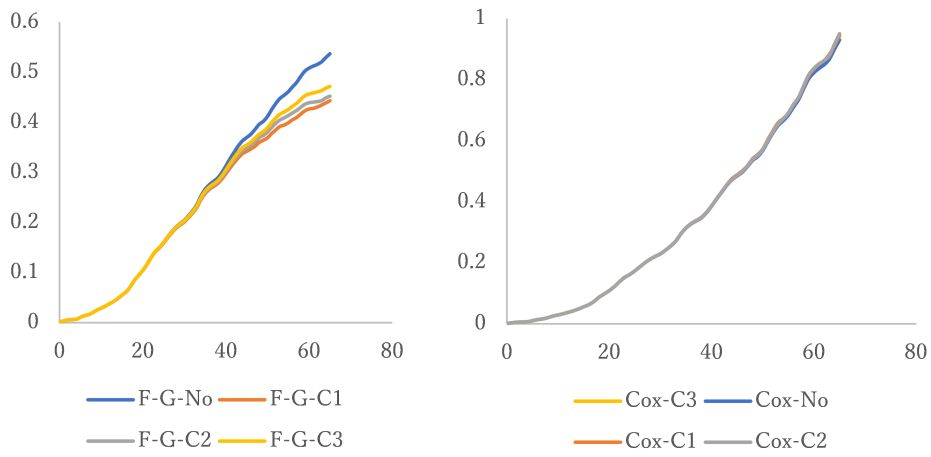


Fig 4. Fine-Gray hazard and Cause-specific hazard by Censoring type.

Fig 5

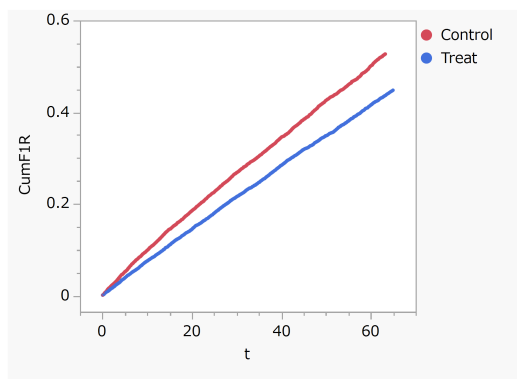


Fig 5. Type-2 removal cumulative incidence for the control and treatment arm.