The Identifiability Problem for Generalised Competing Risk Models with Non-Symmetric Virtual Ages

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Abstract

The identifiability problem is well-known in competing risks (1). Recently a generalised competing risks framework was proposed by Doyen and Gaudoin(2), along with several subclasses of this framework which incorporate virtual age models(3). The identifiability problem is still present in generalised competing risk models with symmetrical virtual ages for each of the risks, however it is unclear to what extent this is true for generalised competing risk models with non-symmetrical virtual ages for the risks.

Bedford and Lindqvist(4) have constructed an example of a two component system in which, every time a component fails it is restored to a state "as good as new", while the remaining components are restored to a state "as bad as old". In this example they prove that the model can be uniquely identified. Doyen and Gaudoin(2) show that this example is a particular instance of a generalised competing risks model with non-symmetrical virtual ages.

In this paper we generalise the Bedford and Lindqvist example to show identifiability of systems with n components. We also discuss how this proof has been constructed to more easily allow for the consideration of other virtual age models in future work.

References

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