Modeling the cumulative incidence function of clustered competing risk data: computational and numerical aspects of a multinomial GLMM approach

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December/2020

Context: clustered competing risk data

Idea: causes competing by the occurence of an event such the

confiability analysis
failure of an industrial or
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survival analysis
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A typical data set consists of

Group	ID	Cause 1	Cause 2	Censorship	Time	Feature
1	1	1	0	0	10	A
1	2	0	0	1	8	A
2	1	0	0	1	7	B
2	2	0	1	0	5	A

What we do?

We model the risk of each competing cause along the time and taking into account the possible within-group dependence
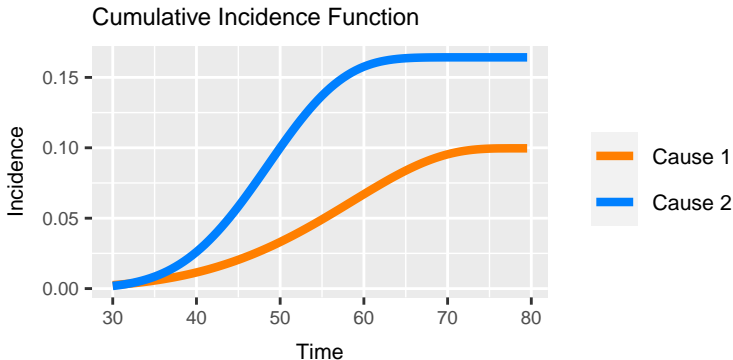
... all this in terms of a

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Cumulative Incidence Function

Main focus application: cancer incidence in twins

Clustered competing risks data
↳ Clusters? Families
↳Family studies
↳ Twins data

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» Taking into account the within-family dependence may reflect both disease **heritability** and the impact of shared **environmental effects**

» A complication is that we have little information to track that **dependence** since each 'family' consists of only a pair of twins

Challenges

» Besides

Thank you

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