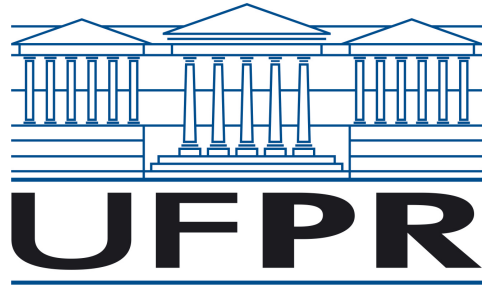
Modeling the cumulative incidence function of clustered competing risk data



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Clustered competing risk data

- Clusters: a dependence structure
- Causes competing by *something*

Something?

- Failure of an industrial or electronic component
- Occurence or cure of a disease
- Progress of a patient clinic state

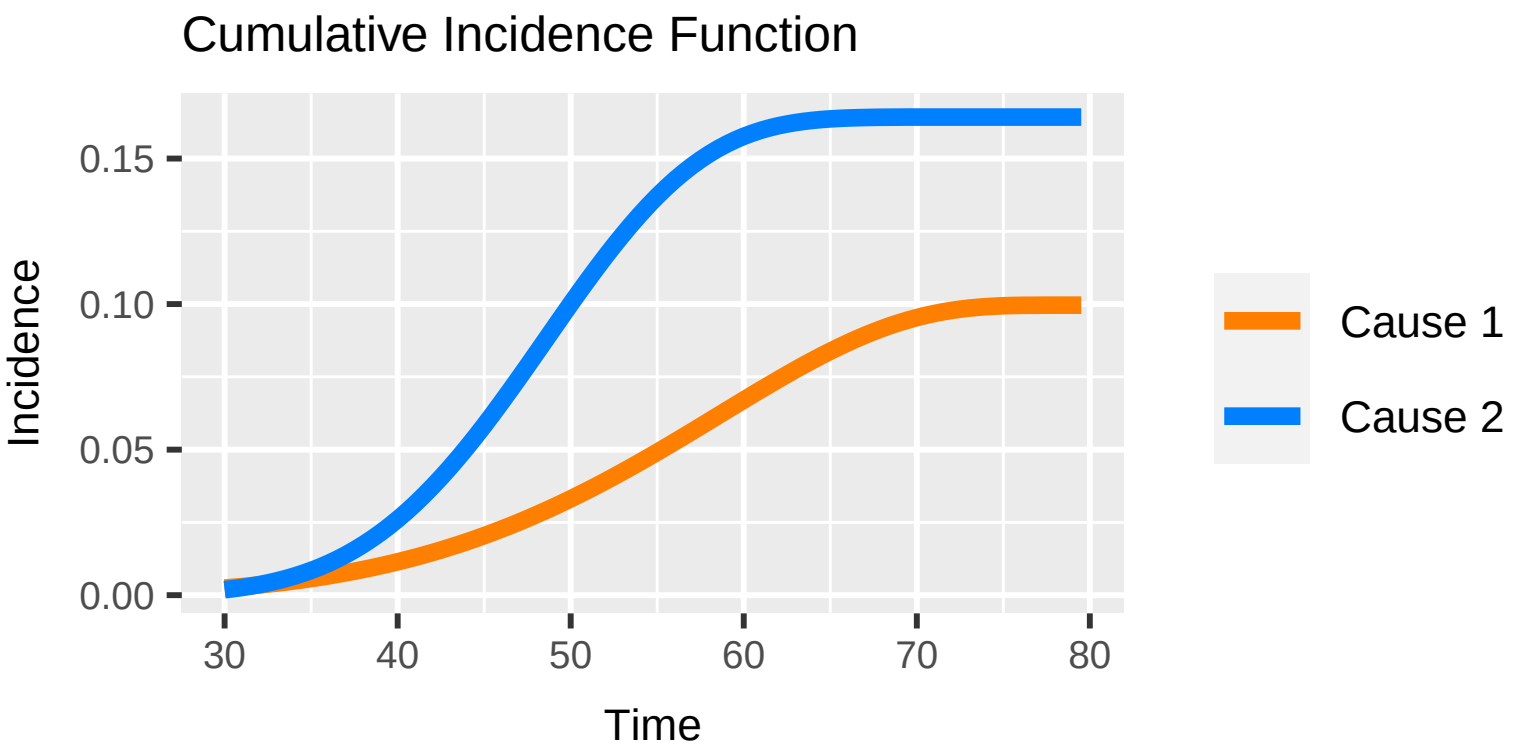
A typical data set consists of

Cluster	ID	Cause 1	Cause 2	Censorship	Time
1	1	Yes	No	No	10
1	2	No	No	Yes	8
2	1	No	No	Yes	7
2	2	No	Yes	No	5

What we do?

We model the probability of each competing cause along the time and taking into account the possible within-cluster dependence

. . . all this in terms of a



Main focus application: cancer incidence in twins

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

- The within-family dependence may reflect
  - disease **heritability**
  - the impact of shared **environmental effects**

Challenges

- We have little information to track that **dependence** since each *family* consists of only a pair of twins
- The data is very simple, we just know if the event occured (yes or no)
- With this, we have to be able to construct the cumulative incidence curves
- And we have to accommodate the within-family dependence, that can happen in different manners

Thank you

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