Parametric G-formula for time-to-event data: bone transplant example

Anna Constantino-Pettit, Suyoung, Kim, Austin Carter

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Paper

The parametric G-formula for time-to-event data: towards intuition with a worked example - Alexander Keil (2014) University of North Carolina Department of Epidemiology

Project

- Review paper
  - How effective is it at explaining the g-formula?
- Recreate their example
  - Data already extracted
  - Reimplement SAS code in R
- Additional analyses
  - Try other methods with the same dataset
  - Make some useful general purpose functions

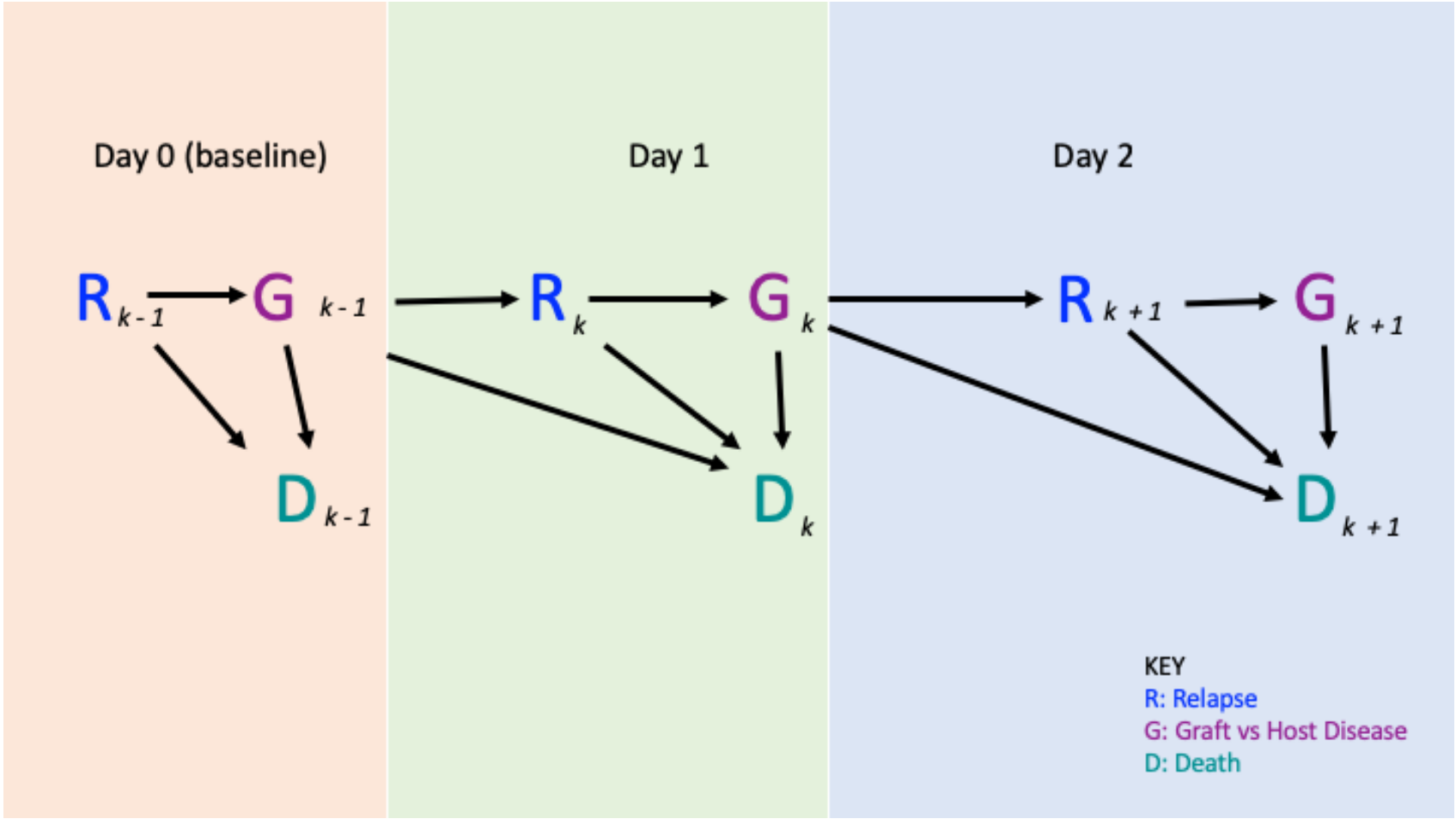
G-formula

- The parametric g-formula can be used to adjust for time-varying confounders that are affected by prior exposures

Worked Example: Data

- 137 individuals who received bone marrow transplants at four medical centers
- Followed until death or censoring at 5 years after transplant
- Covariates include age, sex, leukemia type, wait time from diagnosis to transplant, and CMV immune status
- Primary outcomes are mortality and loss to follow-up

Worked Example: Causal Diagram



Worked Example: G-formula algorithm

1. Model conditional probabilites in observed data
2. Generate time-varying exposures, covariates, and outcomes in Monte Carlo sample
3. Estimate effect measure