Speaker: Connor Gascoigne (University of Bath)

Date: 06/10/2020 on Microsoft Teams

Title: Age-period-cohort modelling

Abstract:
Age-period-cohort models are used in fields ranging from epidemiology and public health to insurance and economics. The fitting and interpretation of these models is non-trivial due to the structural link between the three temporal effects (given two, the third can always be found).
Proposed methods to model age, period and cohort effects together are based on reparameterising the effects into a set of identifiable quantities. A convenient and easily interpretable factor model was proposed by Holford 1983; however, this approach suffers when the effects are not aggregated into equal time intervals (for example, five-year age, five-year period and five year-cohort). A continuous model proposed by Carstensen 2007 is able to deal with non-equal aggregation; however, due to numerous ad-hoc constraints it needs very careful interpretation.
In the following, I outline a method of reparameterising an age-period-cohort model that is identifiable, has an easy interpretation and can be extended to unequally aggregated time intervals. I conclude with a simulation study confirming the reparameterising is working as it should as well as highlighting the issues with modelling all three temporal effects together.

References:
Holford TR. The estimation of age, period and cohort effects for vital rates. Biometrics. 1983;39(2):311-324.
Carstensen B. Age-period-cohort models for the Lexis diagram. Stat Med. 2007;26(15):3018-3045. doi:10.1002/sim.2764