Sections and local group meeting reports.

Multi-state survival models for disease progression

Written by **Gilbert MacKenzie** on November 26th., 2022. Posted in Section and local group meeting reports.

The Northern Ireland local group of the RSS held an online meeting on Wednesday, November 23rd., 2022, at 1pm (GMT), using MS Teams.

The speaker was Dr. Ardo Van der Hout , Department of Statistics, University College London, UK.

Below please find the Abstract and a link to a recording of the full talk.

Multi-state models are routinely used in research where change of status over time is of interest. In epidemiology and medical statistics, for example, the models are used to describe health-related processes over time, where status is defined by a disease or a condition. In social statistics and in demography, the models are used to study processes such as region of residence, work history, or marital status.

Part of the talk will be an introduction to continuous-time multi-state survival models. I will discuss longitudinal data requirements, the link with stochastic processes, and maximum likelihood inference. An important distinction is whether or not exact times are observed for transitions between the states. In many applications, we do not have exact times and it is important to take this into account in the statistical analysis.

I will present two applications: (i) Cancer progression where the challenge is that the data are from a two-arm design with a screening group and a control group. (ii) Change of CD4 cell count with death as competing risk: parsimonious many-state modelling using penalised spline regression. The second application will illustrate that a multi-state model can be seen as an alternative to joint models for longitudinal and time-to-event data.

This was an excellent talk enjoyed by an audience of c40 participants and a full recording of it is available by following the link.

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