On-going TG8 projects

➢ Selected challenges in Multivariable modeling of Survival data:

(Michal Abrahamowicz, Richard J. Cook, Malka Gorfine, Pierre Joly)

Goals:

> To discuss & compare Proportional Hazards (PH) vs Additive Hazards (AH) vs Accelerated Failure Time (AFT) vs "Hybrid" models, re; assumptions, estimation methods, estimands etc.

➢ To assess and validate (i) different criteria to check the underlying modeling assumptions, and (ii) account for their possible violations through flexible modeling of time-varying effects

➢ To compare the estimates obtained using different models,

On-going TG8 projects:
Overview & Recent Developments in Analyzing **Multistate Models**

Malka Gorfine, Richard Cook, Per K. Andersen, Terry M. Therneau, Hein Putter, Pierre Joly, Michal Abrahamowicz

The paper includes the following topics:

- Intensity-based Models.
- Delayed entry and incomplete data on process history.
- Inference for Marginal parameters and pseudo values.
- Intermittent observations.
- Multistate models with frailty approach.
- Software availability (R and Python).

Potential **Future** TG8 projects (**Inter-TG's collaborations**)

- 1/ possible **TG2-TG8** Collaboration:

Validation and Comparison (through "Neutral Simulations") of different methods for joint modeling of Non-linear (TG2) and Time-Dependent (TG8) effects of continuous risk/prognostic factors in Survival analyses (starting with flexible extensions of PH model, then possibly extending to AH and/or AFT frameworks)

*(may be further extended to involve **TG4** for impact of Measurement Errors ?)*

2/ possible **TG7-TG8** Collaboration:

Choice of the causal estimands for complex Survival Analyses.

Potential **Future** TG8 projects (**Inter-TG's collaborations**)

3/ (to be led by Terry Therneau):

- **Validation of Multi-state Models**
  (possible **TG8-TG6 collaboration**)
- *(Selected) Specific Challenges*: Need to consider that accuracy of predictions may vary considerably across different between-states transitions, possibly e.g. by changes-over-time in practice inducing changes in absolute risks…

5/ **Level 1 – 1.5 'guidance paper'** on methods to avoid and detect **Immortal Time Bias** and similar Time-related biases

(Terry Therneau, Malka Gorfine, Michal Abrahamowicz, Hein Putter, Maja Pohar Perme,…)