***Survival analysis with a causal interpretation: Why bother? By Dr Mats Stensrud***

Many scientific questions involve events that depend on time. For example, diseases develop over time, some workers lose their jobs over time, and mechanical devises are only reliable for certain lengths of time. Scientific questions about time-to-events tend to have a causal objective: Does the drug have an *effect* on the disease risk? *What* would happen to unemployment rates *if* the policy were changed?  *How* can we delay the failure time of the devise?

Various statistical estimands have been defined as possible targets of inference in the survival analysis literature, the branch of statistics that concerns time-to-events. In this talk, I will use the counterfactual framework to formalize the interpretation of classical estimands in survival analysis, and I will argue that they often are hard to interpret causally. Then I will introduce new estimands -- the separable effects -- for causal inference in time-to-event settings with competing events. I will explain how the identifying assumptions for these estimand can be evaluated in causal graphs, and I will present three different estimators. As an illustration, I will apply these ideas to analyze data from a randomized clinical trial on estrogen therapy in patients with prostate cancer.