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### **What could be done with prevalent data in the illness-death model?**

A prevalent cohort can be defined as a sample of subjects who have been experienced the initiating event (some condition, like ICU admission or disease onset) and have been still alive at the time of recruitment.

A cross-sectional sampling design is an example of a sampling scheme that results in prevalent data. The time between the initiating event and sampling is called a truncation time.

There are several ways to perform statistical inference under this setting. One can (i) use an unconditional approach, (ii) condition on the value of the truncation variable, or (iii) condition on all the history up to the time of truncation. The latter two approaches are equivalent when analyzing univariate survival outcomes, but differ under the multi-state framework.

We consider the illness-death model and compare between the three estimation approaches in a parametric regression framework. We show that approach (ii) can be much more efficient than the standard approach (iii), though it requires more computational effort. Approach (i) is the most efficient approach, but it requires knowledge on the distribution of the truncation variable and hence is less robust. The methods are compared using a theoretical example and simulations and are applied to ICU data collected in a cross-sectional design, where the illness state corresponds to a bloodstream infection.