WHAT HIDES BEHIND THE DATA?

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In survival and event history analysis the focus is usually on the mere occurrence of events. Not much emphasis is placed on understanding the processes leading up to these events. The simple reason for this is that these processes are usually unobserved. However, one may consider the structure of possible underlying processes and draw some general conclusions from this. For instance, a practically important issue is why hazard rates assume various specific shapes, e.g. why do we often see hazard rates that first increase and then decrease? One important concept being of use here is quasi-stationarity. These are stationary distributions that arise in stochastic processes where probability mass is continuously being lost to some set of absorbing states. Due to this leaking of probability mass, the limiting distribution is just stationary in a conditional sense, that is, conditioned on non-absorption.

I will illustrate these ideas on a medical example concerning neurodegenerative disease, to show that they are not just theory, but are useful for understanding practical problems.