Yaari.s LifeCycle Model in the 21st Century:
Consumption Under a Stochastic Force of Mortality

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We extend the classical lifecycle model (LCM) of consumption over a random-length lifecycle (a.k.a. the Yaari model) to a world in which (i.) the force of mortality obeys a diffusion process as opposed to being deterministic, and (ii.) a consumer can adapt their consumption strategy to new information about their mortality rate (a.k.a. health status) as it becomes available. We solve for optimal retirement consumption and investigate the impact of mortality rate uncertainty vs. simple lifetime uncertainty, assuming the actuarial survival curves are the identical.

In addition to deriving (and numerically solving) the PDE for the optimal consumption function, our main theoretical result is that when utility preferences are logarithmic the initial consumption rates are identical. But, in a CRRA framework in which the coefficient of relative risk aversion is greater (smaller) than one, the consumption rate is higher (lower) and a stochastic force of mortality makes a difference. Yet, at the same time, numerical experiments indicate the relatively small magnitude of the stochastic mortality effect, from an individual's perspective. Our results should be relevant to researchers interested in calibrating the lifecycle model as well as those who provide normative guidance (a.k.a. financial advice) to retirees based on the LCM.