

On the correspondence between CAL and lagged cohort life expectancy
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It has been established that when cohort survival follows the form $p_c(x,t)=p_c(x-rt,0)$ (linear shift assumption), CAL(t) is equal to the life expectancy for the cohort born at time $t-CAL(t)$, or, equivalently, $e_0^c(t)$ is equal to CAL for the period $t+e_0^c(t)$. In other words, under the linear shift assumption, current CAL is equal to the life expectancy for the cohort currently reaching its life expectancy. This correspondence also holds, albeit approximately, when the force of mortality follows the form $\mu(x)=\alpha \exp(\beta x-rt)$ (assumption of Gompertz mortality with age-invariant log-linear change). This correspondence is important, because the cohort life expectancy for the cohort currently reaching its life expectancy, or lagged cohort life expectancy (LCLE), has been discussed in the tempo literature as a summary mortality measure of substantive interest. In situations where this correspondence holds, LCLE can be readily estimated using CAL, which, unlike LCLE, does not require mortality information beyond the current period.

In this paper, we establish that the CAL-LCLE correspondence holds in a variety of empirical situations, present or historical, including ones in which none of the above assumptions apply. The correspondence is particularly accurate for life expectancy at age 60. We describe the patterns of mortality change that create this correspondence in the absence of the two assumptions established earlier, and provide some more general principles about the extent to which CAL can be used as an estimate of LCLE. Finally, we discuss the implications of the CAL-LCLE correspondence for using CAL (or LCLE) as a summary mortality measure, and for the projection of cohort mortality.