Multidimensional Mortality Selection
and the Black-White Mortality Crossover

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The black-white mortality crossover is one of the enduring topics of demographic research. But there is a gap between recent empirical work on the crossover and the theoretical work on mortality selection that has generated demographic intuitions about the crossover. In the theoretical models, the crossover results from greater mortality selection among blacks against a single dimension of heterogeneous mortality risk. In contrast, the questions posed in recent empirical work assume that the heterogeneity that generates the crossover is multidimensional. Yet there is no explicit model of the crossover in the context of multidimensional mortality selection.

We provide such a model and explore its properties analytically and with simulations. We show that even a simple two-dimensional mortality selection model produces unpredictable crossover timing, casting doubt on whether the results of recent empirical studies truly shed light on crossover dynamics. The instability in crossover timing stems from the fact that, in a multidimensional setting, the counter-intuitive mortality selection dynamics that are well-known in the unidimensional setting (i.e., compositional differences created by mortality; mortality crossovers) occur at many levels simultaneously and interact in complex ways.

These results highlight the need to integrate formal demographic modeling with substantively realistic understandings of social stratification in the study of mortality selection. But they also suggest that such an integration brings real challenges to using the age at crossover to learn about unequal mortality within and across races.