



Harnessing Demographic Skewness: Insights and Applications

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Skew-symmetric distributions, such as the skew-normal family, can offer a powerful and parsimonious framework for demographic modeling, moving beyond the constraints of classical distributions. Their utility extends beyond mere flexibility in curve-fitting providing a formal statistical lens through which to interpret the dynamic, often asymmetric, shapes of key demographic profiles. In fertility analysis, the skewness of the age schedule of fertility is highly sensitive to period shocks. During crises (e.g., pandemics, economic recessions), the displacement or postponement of births often manifests as a rapid, transient increase in negative skewness, reflecting a compression of fertility at older reproductive ages. Conversely, a recuperation phase or a surge in "catch-up" births can produce a pronounced positive skew. Analyzing cohort fertility through this lens allows demographers to quantify and separate the tempo and quantum effects of such disruptions more effectively than with symmetric models. In mortality analysis, the skewness of the age-at-death distribution can encapsulate information about the population's health heterogeneity and the process of mortality selection. This study demonstrates the application of skew-symmetric models to both fertility and mortality, using data from multiple national populations.