

Peer Review

Review of: "Compositional Data Analysis for Modelling and Forecasting Mortality with the α -Transformation"

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Scientific Review of the Article:

"Compositional Data Analysis for Modelling and Forecasting Mortality with the α -Transformation"

The article investigates the application of the α -transformation in compositional data analysis (CoDA) for mortality forecasting, particularly as an alternative to the conventional centered log-ratio (CLR) transformation. It emphasizes the significance of mortality forecasting in demographic planning and highlights the limitations of traditional extrapolative methods. The authors present a comprehensive methodology that includes data preprocessing, the application of both transformations, and the evaluation of their forecasting accuracy across multiple European countries.

Overall, the article represents a significant advancement in the field of mortality forecasting through the introduction of the α -transformation. The methodology is rigorous, and the findings are well-supported by the data. However, addressing the identified weaknesses would enhance the clarity and applicability of the research. The study is a valuable contribution to the literature and offers a promising avenue for future research in mortality modeling. The article presents a strong subject matter, but the following changes are suggested to improve its content:

1. Since the statistical modeling and transformations employed in this paper seem complex and effective, it is suggested to add a more intuitive explanation of the α -transformation and its advantages over the CLR transformation, which could make the content more accessible to a broader audience.
2. The study focuses solely on European countries, which may limit the generalizability of the findings to non-European contexts. This represents a limitation of the paper. I suggest that the

authors discuss the applicability of the α -transformation in different demographic settings, or they can mention this point in the limitations of the study section at the end of the manuscript.

3. Although the use of an expanding window approach for cross-validation is a strength, the authors should address the potential for overfitting, especially given the flexibility of the α -parameter. A discussion on how overfitting is mitigated in their analysis would be beneficial.
4. While the authors acknowledge the limitations of the CLR transformation, a more in-depth discussion of the limitations of the α -transformation itself—including scenarios where it may not perform well—would provide a more balanced perspective.

Declarations

Potential competing interests: No potential competing interests to declare.