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BMI Trajectories and the Influence of Missing Data

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Introduction: Body Mass Index (BMI) trajectories have been estimated in various ways. These estimates are important to understand how BMI develops over time and for use in cost-effectiveness analysis. However, missing data is often stated as a limitation in studies that analyse BMI over time and there is little research into how missing data can influence these BMI trajectories. The aim of this study is to determine how much influence missing data can have when estimating BMI trajectories and to explore the effects this has on subsequent analysis.

Methods: This study uses data from the English Longitudinal Study of Aging. First, a growth mixture model is used to estimate distinct BMI trajectories in adults over the age of 50. Next, methods that assume data is missing at random (MAR) are used: complete case analysis and multiple imputation. Finally, Diggle Kenward and Roy methods that assume data is missing not at random (MNAR) are implemented. Estimated trajectories from each method are then used to predict the risk of developing type 2 diabetes (T2DM) using discrete-time survival analysis.

Results: Four distinct trajectories are identified using each of the methods to account for missing data: stable overweight, elevated BMI, increasing BMI, and decreasing BMI. However, the likelihoods of individuals following the different trajectories differs between the different methods.

Results show that the influence of BMI trajectory on T2DM is reduced after accounting for missing data. More work is needed to understand which methods for missing data are most appropriate and give the most reliable results.

Conclusions: Missing data can significantly influence estimations of BMI trajectories. When using BMI trajectories to inform cost-effectiveness analysis or policymaking, missing data should be considered. More research is needed to examine the extent to which accounting for missing data might influence the cost-effectiveness of policies, e.g. weight management interventions.

Key messages:

- Missing data is important when modelling BMI trajectories.
- More research is needed to examine the extent to which accounting for missing data might influence the cost-effectiveness of policies, e.g. weight management interventions.