Density Estimation of Usual Intake for Food Consumption Data

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Abstract: In nutrition study, one of the research of interests is to estimate the distributions of individuals' usual intakes of episodically consumed foods, such as fruit, meat, alcohol, etc. However, the usual intakes can not be directly obtain, due to the heavy cost of nutritional surveys. Alternatively, contaminated version of the usual intakes (i.e. 24-hour dietary recalls) are observed, with significant measurement errors. Some foods, like alcohol, are never consumed by a proportion of people, making the usual intake a mixture of discrete and continuous distribution. This phenomenon makes existing non-parametric approaches break down, and new methods need to be developed for such data. We propose a new model regarding the food, which is consumed by only a proportion of population. A new estimation approach is developed and studied in terms of theoretical and numerical aspects.