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Abstract

Post Hoc Subgroup Analysis and Identification—Learning More from Existing Data †

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Abstract: Personalized nutrition aims to exploit heterogeneity. One reason for heterogeneity may be the presence of one or more subgroups that respond better to a dietary intervention than the observed average in the entire population considered. However, designing studies solely with the intention to carry out subgroup analyses is challenging as the subgroups may be unknown. In addition, anticipated subgroup effects are rarely known in advance. This study investigates the usefulness of a methodology where principled post hoc investigations of subgroup effects are used. By means of both supervised and unsupervised learning approaches, relevant subgroups were identified using baseline covariate information. The unsupervised approach involved a principled search strategy for determining optimal cut-offs such as regression trees. Once subgroups had been identified, statistical models including treatment-subgroup interactions were fitted to estimate the subgroups effects. Data from a published nutrition trial on weight loss in children were re-evaluated to identify the subgroups that benefitted more than the average from the dietary intervention. Very preliminary results indicated that a number of subgroups could be identified using baseline covariates. Subgroup analysis seems to be underutilized in nutrition, forfeiting valuable information that could potentially inform future personalized nutrition strategies. This is particularly relevant as it is a common finding that nutrition trials only detect small average effects of dietary interventions.

Keywords: subgroup analysis; interaction; regression trees; baseline covariates; personalized nutrition

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