Are there latent decision rules in expert occupational exposure assessments?

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The expert assessment approach to determine occupational exposure risk factors based on questionnaire responses in population-based epidemiology studies is often criticized because it occurs in a 'black box' and does not provide any mechanism for applying the expert's decision rules to other studies that used the same questionnaires. However, there are likely latent rules used by the experts while determining the exposure assignments. In this analysis, we use data mining methods implemented in *R*, including classification and regression trees (CART) and tree ensembles, to determine if latent rules can be uncovered from questionnaire responses and an expert's assigned exposure metrics in a study of diesel exhaust exposure. Uncovering the latent decision rules provides a mechanism for replicating these decision rules in other subjects within or across studies, making the often lengthy exposure assessment process in epidemiologic studies more efficient.