Partial Identification of Personalized Treatment Response with Trial-reported Analyses of Binary Subgroups

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Medical journals have adhered to a reporting practice that seriously limits the usefulness of published trial findings. Medical decision makers commonly observe many patient covariates and seek to use this information to personalize treatment choices. Yet standard summaries of trial findings only partition subjects into broad subgroups, typically into binary categories. Given this reporting practice, we study the problem of inference on long mean treatment outcomes E[y(t)|x], where t is a treatment, y(t) is a treatment outcome, and the covariate vector x has length K, each component being a binary variable. The available data are estimates of {E[y(t)|xk = 0], E[y(t)|xk = 1], P(xk)}, k = 1, . . . , K reported in journal articles. We show that reported trial findings partially identify {E[y(t)|x], P(x)}. Illustrative computations demonstrate that the summaries of trial findings in journal articles may imply only wide bounds on long mean outcomes. One can realistically tighten inferences if one can combine reported trial findings with credible assumptions having identifying power, such as bounded-variation assumptions.