Monotonicity Violations for Ill-Defined Preference-Based Instruments.

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INTRODUCTION: Instrumental variable (IV) methods using preference-based instruments are increasingly used in comparative effectiveness research. Many IV studies estimate the local average treatment effect (i.e. the effect in the ‘compliers’) under the assumption of monotonicity, i.e. no ‘defiers.’

METHODS: We assessed this assumption empirically in a survey of 53 physicians who reported treatment plans and prescribing preferences for hypothetical patients who were candidates for antipsychotic treatment.

RESULTS: Using commonly proposed proxies to measure preference (e.g. the prior patient’s treatment), nearly all patients exhibited some degree of monotonicity violations. In addition, patients could not be cleanly classified as compliers, defiers, always-takers, or never-takers.

CONCLUSIONS: Our findings indicate that preference-based IV estimates should be interpreted cautiously because bias due to monotonicity violations is likely and because the subpopulation to which the estimate applies may not be well-defined. Investigators using preference-based instruments may consider supplementing their study with a survey to empirically assess the magnitude and direction of bias due to violations of monotonicity.