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Benefits and limitations of randomized controlled trials: A Commentary on Deaton and Cartwright

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I agree with Deaton and Cartwright that randomized trials are often overrated. There is a strange form of reasoning we often see in science, which is the idea that a chain of reasoning is as strong as its strongest link. The social science and medical research literature is full of papers in which a randomized experiment is performed, a statistically significant comparison is found, and then story time begins, and continues, and continues—as if the rigor from the randomized experiment somehow suffuses through the entire analysis.

Here are some reasons why the results of a randomized trial cannot be taken as representing a general discovery:

1. Measurement. A causal effect on a surrogate endpoint does not necessarily map to an effecton the outcome of interest. Direct measurements also can be problematic if there is bias that is correlated with treatment assignment, as can occur in medical experiments without blinding or psychology experiments in which there is information leakage.

2. Missing data. Even a small proportion of dropout or nonresponse can bias the estimate oftreatment effects, if missingness is correlated with outcome and treatment assignment.

3. Extrapolation. The participants in a controlled trial are typically not representative of thelarger population of interest. This causes no problem if the treatment effect is constant but can leads to bias to the extent that treatment effects are nonlinear and have interactions. A related concern is realism: extrapolating from often-