Potential outcomes are *possibilities*. They haven’t happened, they just could happen. And their occurrence is based on whether D=1 or D=0.

Actual/historical/empirical outcomes are those outcomes we observe when D=1 or D=0. It’s the outcome that happened in real life.

Y1 or Y0 – either of these could’ve occurred. Y1 represents the outcome associated with treatment assignment (D=1). Y0 represents that outcome associated with control (D=0) *for the same person at the same time period.* Schoolforeconomics at 11:05 as a possibility .

Y, on the other hand, is a selection of either Y1 or Y0. Y is based on whatever D was chosen. So if D=1, then Y=Y1. And if D=0, then Y=Y0. So what occurs in reality is based on what treatment assignment was made. And treatment assignment chooses from all possible potential outcomes.

Y1 – Y0 is the “causal effect” of the treatment. It’s comparing reality to a “counterfactual”. This is different from the estimation phase. This is the target parameter definition phase.

Distinguish between “definition of a causal effect” and *“estimation of a causal effect”*. Defining the causal effect is Y1-Y0. It is based on individual level counterfactuals. And counterfactuals are the potential outcomes *not chosen*.

Estimation takes data and econometrics and *estimates* various kinds of target parameters like the average treatment effect, or the local average treatment effect. Randomized controlled trials are methods for estimating ATE. RCT does not recover the “true ATE” – it is an unbiased estimate of the ATE.