

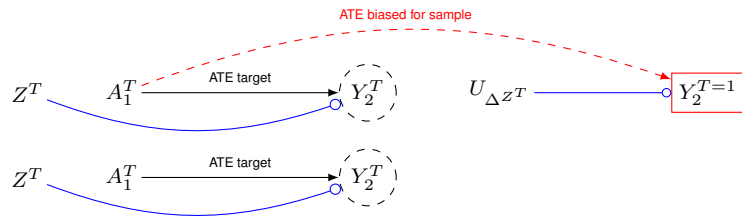
## Bias

## Causal Graph

1

**Problem:** sample is too restrictive. Sample ATE does not transport to target population.

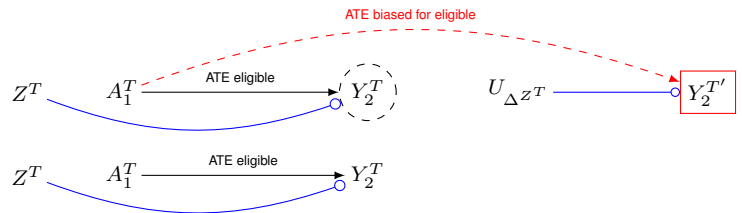
**Response:** sample from targeted (unrestricted) population.



2

**Problem:** absence of eligibility criteria.

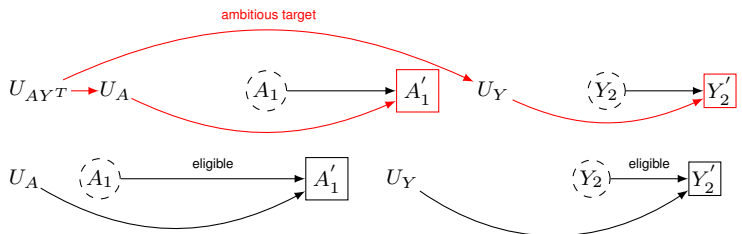
**Response:** eligibility criteria.



3

**Problem:** unmeasured correlated treatment/outcome errors in a heterogeneous target sample.

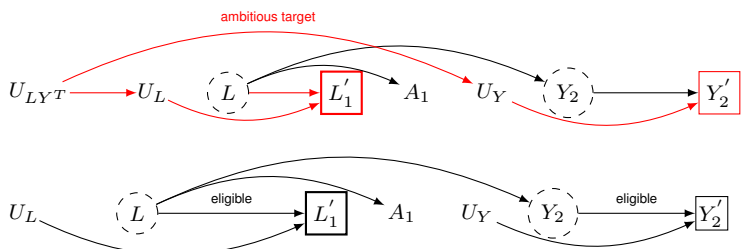
**Response:** eligibility criteria.



4

**Problem:** unmeasured correlated control/treatment errors in a heterogeneous target sample.

**Response:** eligibility criteria.



## Key:

$A$  denotes the treatment;

$Y$  denotes the outcome;

$L$  denotes a confounder;

$\rightarrow$  asserts causality

$Z \rightarrow \circ Y$  indicates effect modification of  $A \rightarrow Y$  by  $Z$ ;

$\rightarrow$  indicates a pathway for bias linking  $A$  to  $Y$  absent causation

$(X) \rightarrow [X']$  indicates a latent variable  $X$  measured by proxy  $X'$ .

$U_X \rightarrow [X']$  denotes an unmeasured source of measurement error for the true  $X$ ;

$[X]$  indicates that conditioning on  $X$  introduces bias.

$U_{\Delta Z} \rightarrow \circ Y$  indicates effect modification of  $A \rightarrow Y$  by  $U_{\Delta Z}$