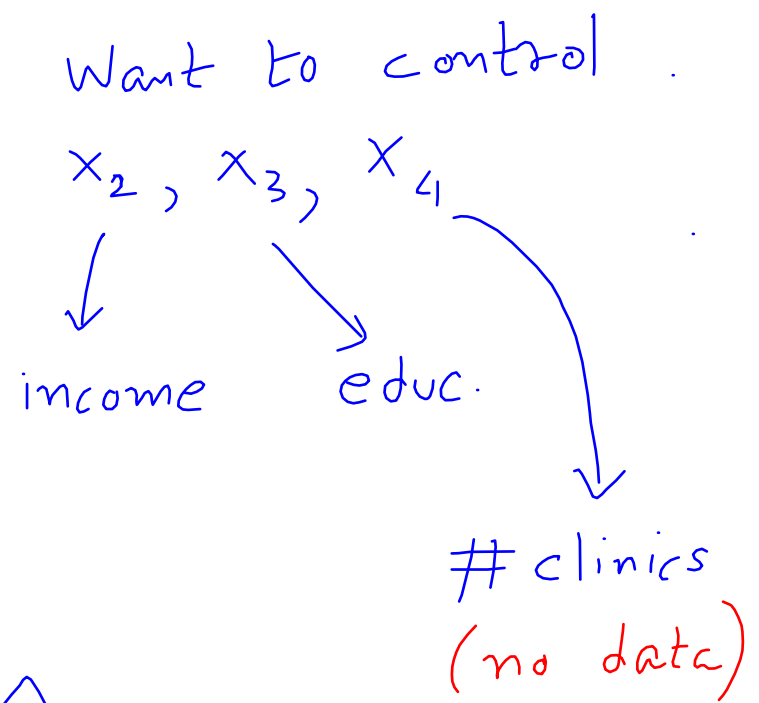
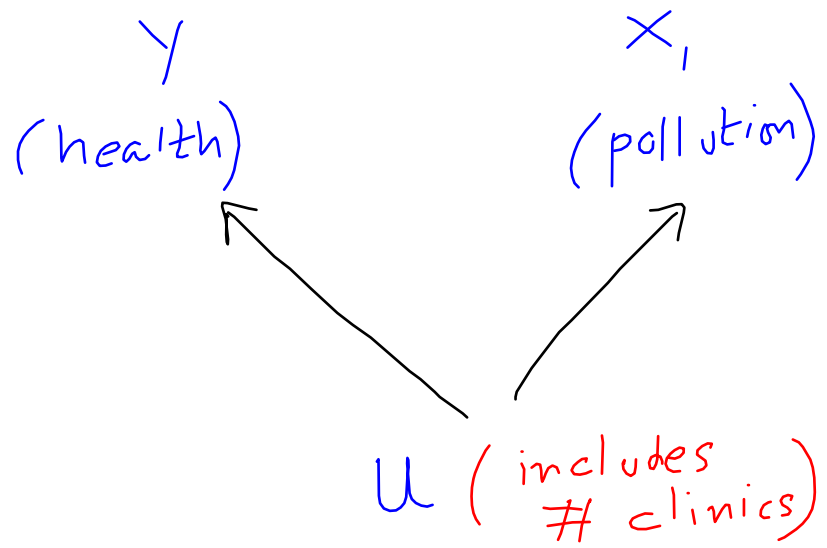


Omitted Variables Bias (OVB)

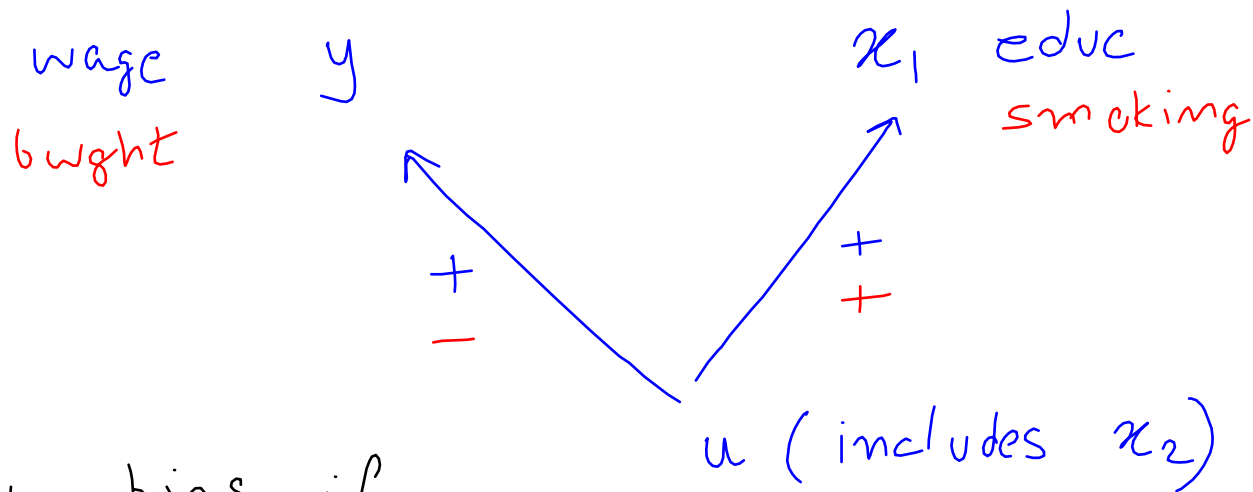


OLS estimator for $\hat{\beta}_1 \rightarrow$ biased
OVB

Depends on how # clinics related to X_1 and Y .

Env. regulⁿ \rightarrow maybe only X_1

Genetic characteristics \rightarrow " Y



No bias if

$$\beta_2 = 0 \quad \text{or}$$

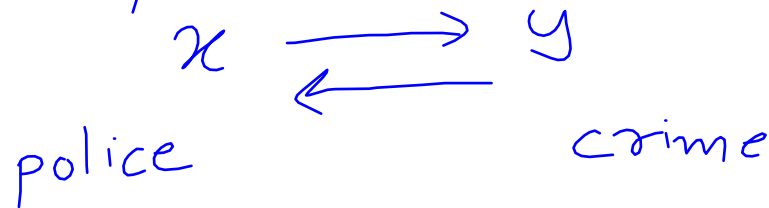
x_2 is uncorr. w/ x_1

More complicated derivation of bias w/
add. explanatory vars.

other sources of bias :

Measurement error in x or y .
(e.g. crime, distance, ...)

Simultaneity



Sample selection

data observed if $y > \text{threshold}$
(e.g. trade)

Inclusion of irrelevant regressors

- exercise caution e.g.

y	x
# accidents	alcohol laws, alcohol consumption?
wage	educ., occupation, discrimination?

Y

exam
score

test score

wt.

cost of
visit

X

hrs. studied

sleep

exercise

length of stay at hospital

U (aptitude etc.)

stress

genetics

reason