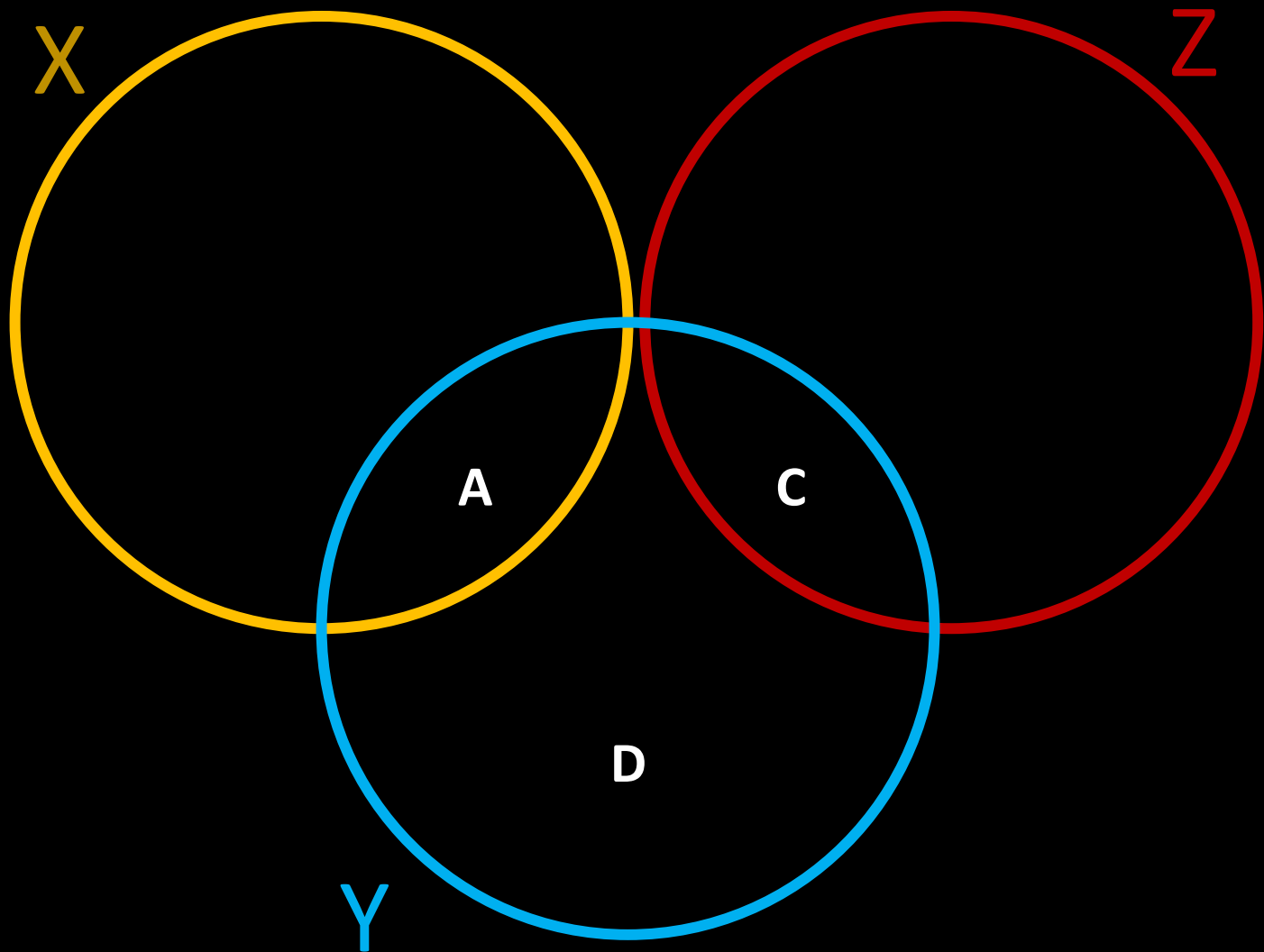
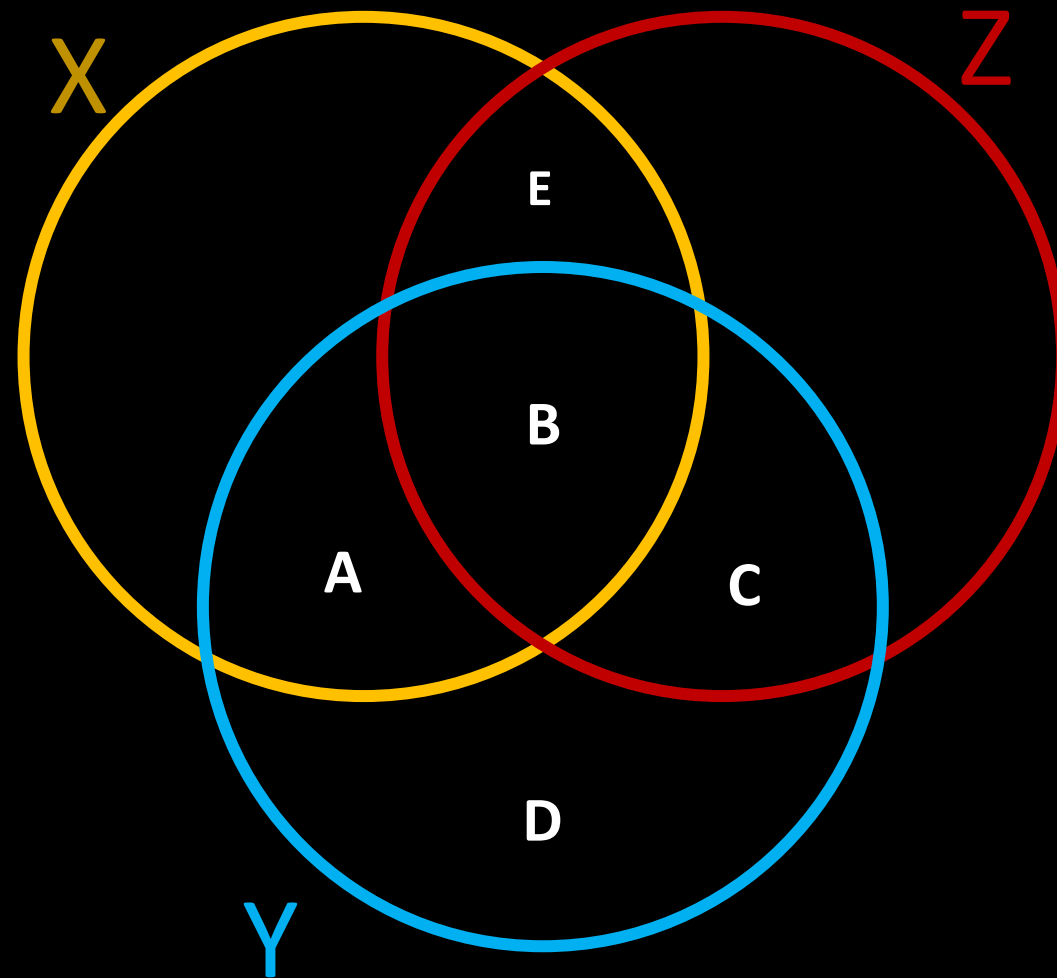


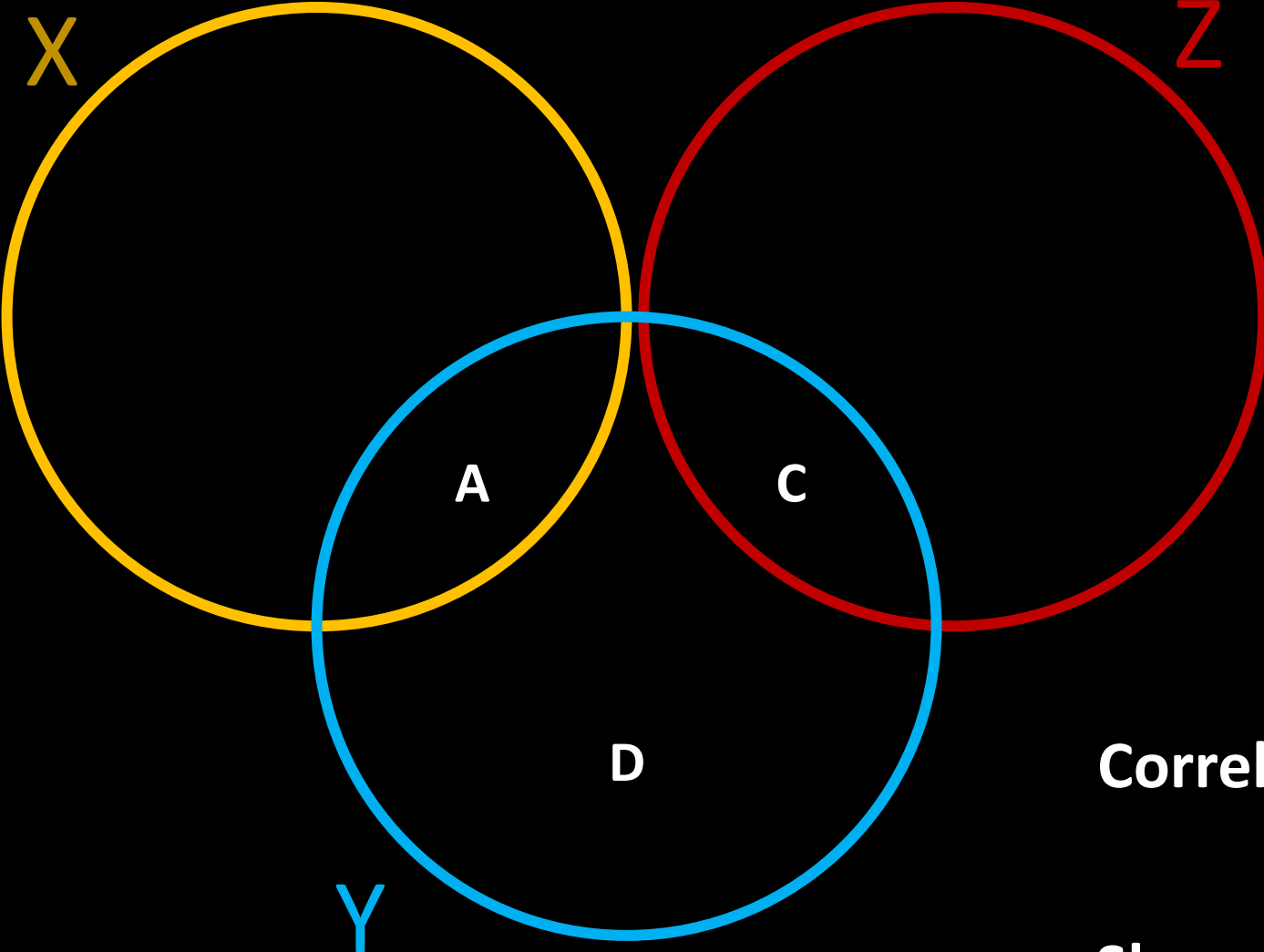
Covariate Just Related to Y (Not X)



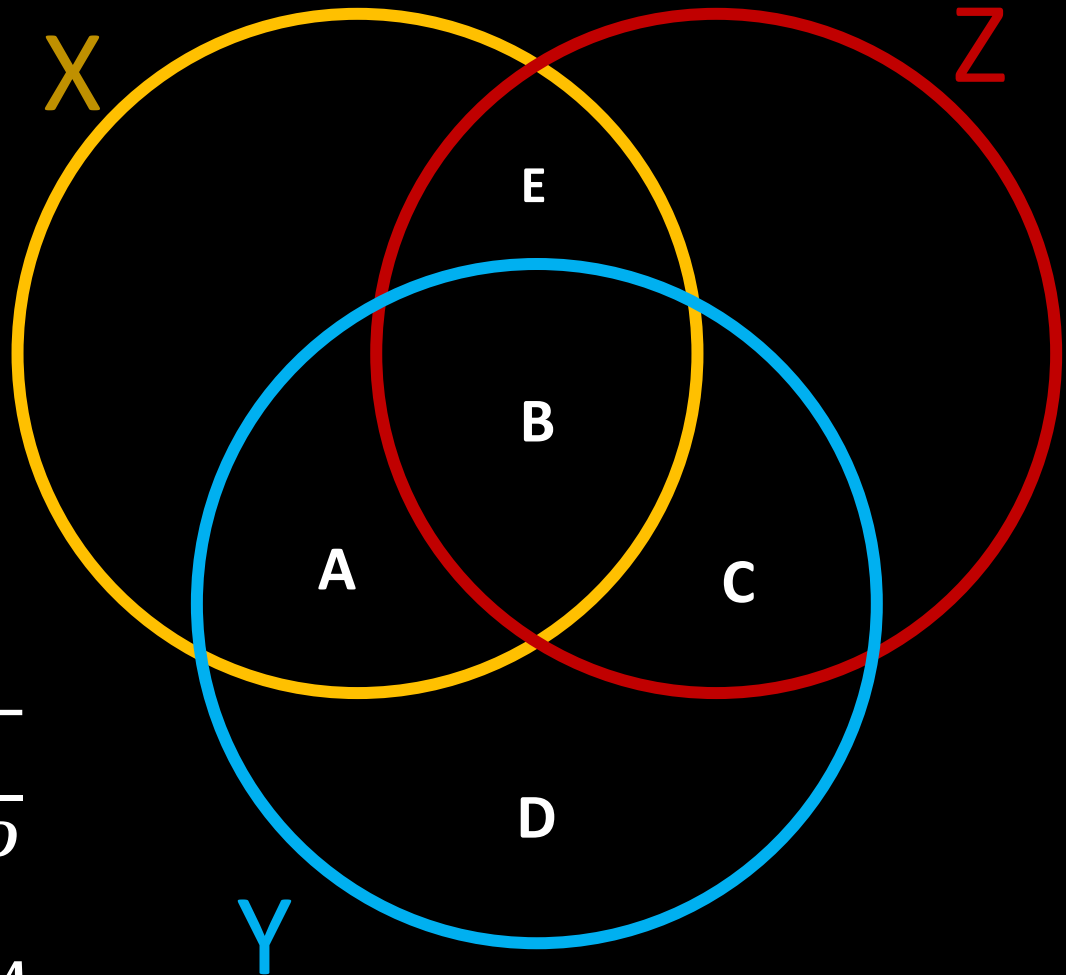
Covariate Related to X & Y



Covariate Just Related to Y (Not X)



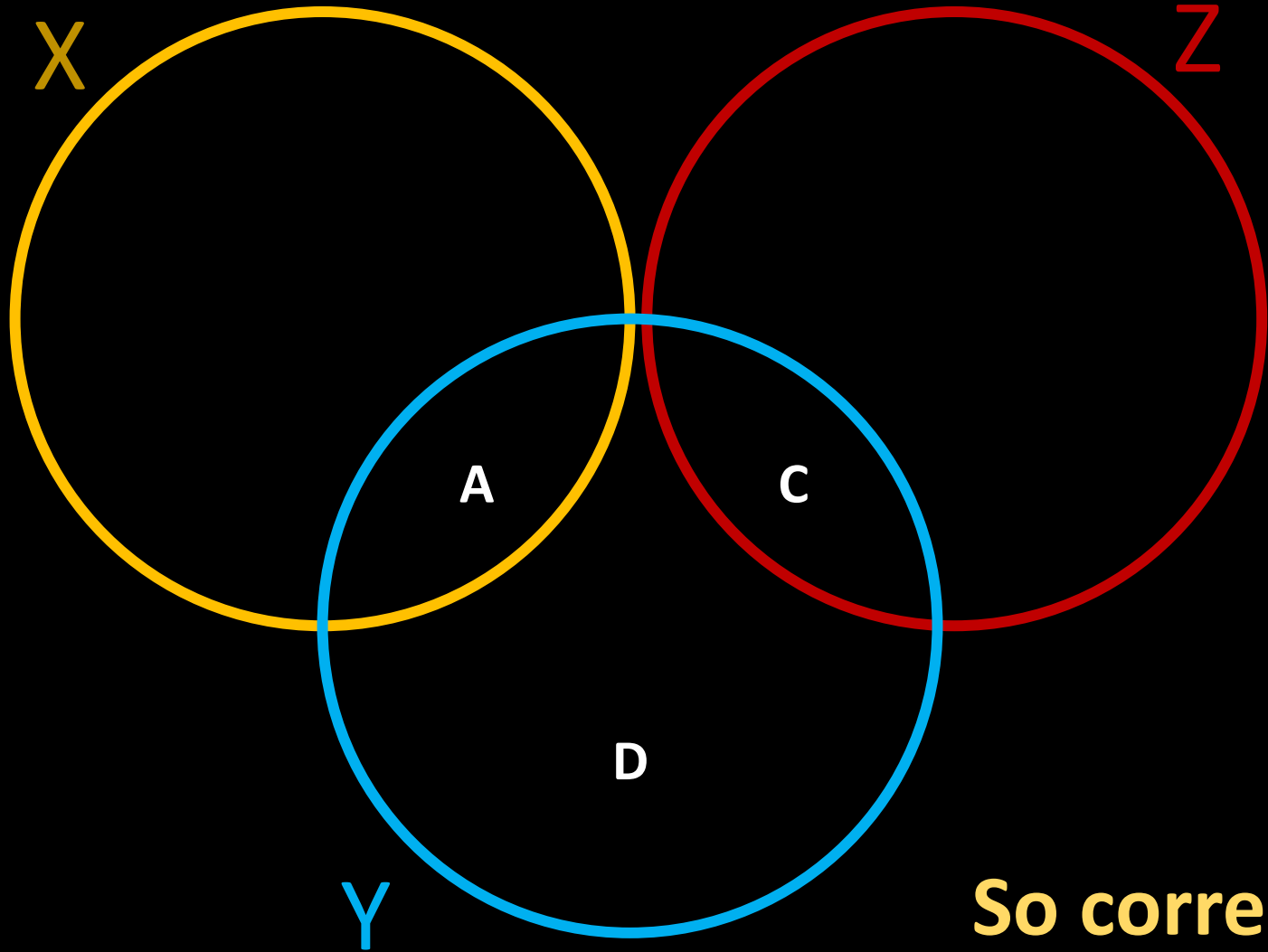
Covariate Related to X & Y



Correlation = $\sqrt{\frac{A}{A+D}}$

Slope = $\frac{Cov(X,Y)}{Var(X)} \approx \frac{A}{X}$

Covariate Just Related to Y (Not X)



$$\text{Correlation} = \sqrt{\frac{A}{A+D}}$$

$$\text{Slope} = \frac{\text{Cov}(X,Y)}{\text{Var}(X)} \approx \frac{A}{X}$$

What areas change when we add Z?

D changes (C is taken out)

So correlation will change, but the slope won't

Covariate Related to X & Y

$$\text{Correlation} = \sqrt{\frac{A}{A+D}}$$
$$\text{Slope} = \frac{\text{Cov}(X,Y)}{\text{Var}(X)} \approx \frac{A}{X}$$

What areas change when we add **Z**?

D changes (B and C are taken out)
X changes (B and E are taken out)

So both correlation and slope will change

