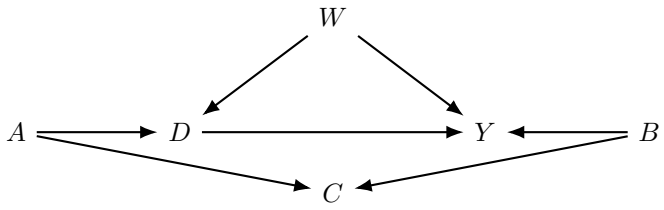
PS200C: Quantitative Methods

In-class Activity 6: DAGs in practice

Name: _____

Consider the DAG below. All variables are observed. D is treatment, Y is the outcome.



Question 1: Find the backdoor paths

List every backdoor path from D to Y (any path that starts with an arrow *into* D and ends with an arrow into Y).

Question 2: Which sets satisfy the backdoor criterion?

For each candidate adjustment set below, say whether it would satisfy backdoor criterion (for the effect of D on Y) and explain why or why not. (Hint: use the backdoor paths you found in Q1.)

(a) $X = \{W\}$

(b) $X = \{W, C\}$

(c) $X = \{W, A\}$

(d) $X = \{A, C\}$

Question 3: Translate backdoor into CI

Suppose I give you an $\{X\}$ that does satisfy the backdoor criterion. What conditional independence assumption does that imply? Write it out in terms of D, $Y(d)$, and X.

What does the backdoor criterion have to do with understanding the various sources of association between D and Y, and how does this relate to making a claim about the effect of D on Y?

Bonus (time permitting): In Q2, one invalid set was invalid because conditioning on it *opened* a path that was previously blocked (or, created a source of $D-Y$ association that was not previously there). Which set, and which path?