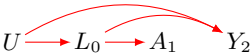
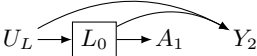
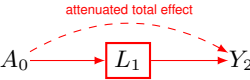
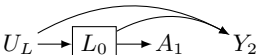
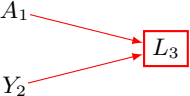
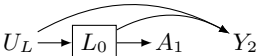
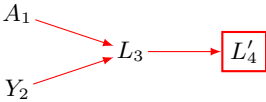
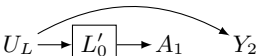


Bias	Problem	Sequential data solution
<p>1 Condition on common cause or its proxy: A and Y share both measured and unmeasured common causes; we condition to block the open backdoor path.</p>		
<p>2 Do not condition on a mediator: inaccurate timing: L blocks true causal association $A \rightarrow Y$.</p>		
<p>3 Do not condition on a collider: inaccurate timing: L creates path from $A \rightarrow Y$.</p>		
<p>4 Proxy rule: conditioning on a descendent is akin to condition on its parent: inaccurate timing: confounder proxy L' creates a path from $A \rightarrow Y$.</p>		

Key:

A denotes the treatment;

Y denotes the outcome;

U denotes an unmeasured confounder;

L denotes a confounder;

\rightarrow asserts causality

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

X indicates that conditioning on X introduces bias.

Where ϕ_t denotes assumed confounding, examples 2-4 illustrate how errors in $L_{\phi_t} \neq L_t$ lead to confounding.