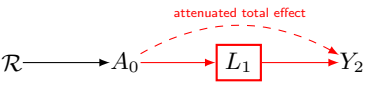
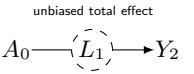
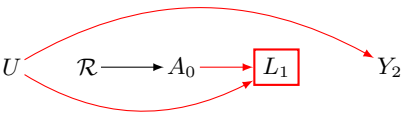
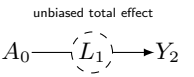
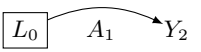
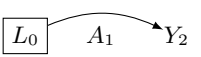
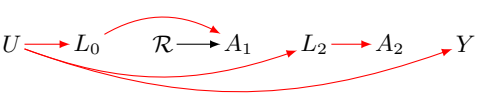
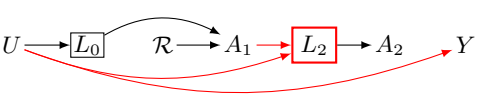
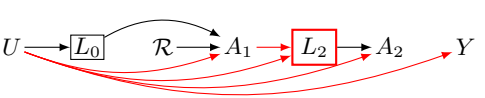
Examples of Bias in Experiments

	Bias	Problem	Response
Post-randomisation adjustment			
1	Post-treatment adjustment blocks treatment effect		
2	Post-treatment adjustment induces collider stratification bias		
3	Demographic measures at the end of study condition on a collider that opens a back-door path.		
4	Demographics measured post-outcome		
Directed measurement error			
5	Treatment affects measurement error of the outcome		Sensitivity analyses
Confounding of the per-protocol effect			
6	Per protocol effect in a sustained treatment is lost because a confounder affects adherence		Condition on L_0 and L_1
7	Per protocol effect lost in sustained treatment because treatment affects confounder of adherence		Use special estimators
8	Per protocol effect lost in sustained treatment because both measured and unmeasured confounders affect treatment adherence		Use special estimators: stronger assumptions

Key: A denotes the treatment, sequential in $\mathcal{G}$6-8; Y denotes the outcome; $\mathcal{R}$ denotes randomisation; U denotes an unmeasured confounder. Note there is no arrow into treatment assignment at baseline because treatment assignment is randomised; L denotes a common cause of treatment and outcome or a proxy of such a common cause or mediator along the path between treatment and outcome. Whether L should be conditioned upon depends on structural features of context; $\boxed{L}$ **black box** denotes conditioning on variable L; ⟶ **black arrow** assumes causality; ⟶ **red arrow** denotes a path of bias; ⇢ indicates a path for bias separating A and Y; $\boxed{L}$ **red box** denotes a case when conditioning on X induces bias; (L) **Dashed circle:** Latent variable, not adjusted (assumed for U).