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Measurement Bias

For each of the following scenarios, draw a DAG and identify the structure of the measurement bias.

1. Researchers are interested in estimating the effect of maternal smoking during pregnancy on birth defects. The investigators use a case-control design, where mothers are asked (after having delivered) to retrospectively report on how much they smoked during pregnancy.

2. The goal of the study is to compare the effect of two different chemotherapy regimens on prostate cancer recurrence. The researchers use data from electronic health records to complete this study. However, one of the chemotherapy regimes is known to have more side effects, so patients who receive that type of chemotherapy are more closely monitored than patients who receive the other type of chemotherapy.

3. The goal of the study is to estimate the effect of tylenol on liver toxicity. The investigators use data from electronic health records, where there may be random data entry errors.

4. A team of researchers is interested in estimating the effect of childhood BMI and age of menarche. They recruit participants for their study and conduct retrospective telephone interviews in which participants recall their height, weight and age of menarche

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