

For each of the following scenarios, call out the potential biases in the proposed experiment. Do your best to try to discover not only the bias, but the initial design. There is plenty of room for interpretation here, so make sure to state what assumptions you're making.

- You're testing advertising emails for a bathing suit company and you test one version of the email in February and the other in May.
- You open a clinic to treat anxiety and find that the people who visit show a higher rate of anxiety than the general population.
- You launch a new ad billboard based campaign and see an increase in website visits in the first week.
- You launch a loyalty program but see no change in visits in the first week.

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You're testing advertising emails for a bathing suit company and you test one version of the email in February and the other in May.

Bias from seasonality. People are more likely to respond to bathing suit emails in warmer May month. Better to test the emails in the same time period with 2 different groups.

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You open a clinic to treat anxiety and find that the people who visit show a higher rate of anxiety than the general population.

Perhaps people who go to any sort of clinic have higher anxiety than general population. Better test would be to compare anxiety against a control group of patients visiting another type of clinic.

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You launch a new ad billboard based campaign and see an increase in website visits in the first week.

Were there any other promotions that occurred that week in addition to the billboards? Were there any special events that triggered high volume of street traffic that week? How do the billboards compare to other forms of advertising? Since billboards are something you see often, their goal is not only to drive traffic but to increase brand perception and stickiness. How are you measuring these?

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You launch a loyalty program but see no change in visits in the first week.

Is # website visits the best outcome indicator? Perhaps the loyalty program is positively impacting the usage of your services and revenue for existing customers?