Part 2: Study Designs

There are 4 main study designs that we look at as part of this standard. They are **polls**, **surveys**, **experiments**, and **observational studies**. The conclusions we can make and how we talk about each study are slightly different, so it is important to be able to identify the different study designs.

Polls and **Surveys** are very similar in that they ask a sample of people questions to determine either the **opinion distribution** (for a **poll**) or a **population parameter** (for a **survey**). A **population parameter** is a number representing a property of a population, for example the mean, median, a proportion etc. An **opinion distribution** is the proportion of the target population that has each opinion, for example the proportion of people planning on voting for each political party. **Polls** typically have very few questions and are multi-choice only. Surveys have many questions, may have branches and skips, may have a "tick multiple boxes" questions and may have open-ended, write a comment questions.

An **experiment**, while the term is more general, in this standard refers to a study in which a researcher attempts to understand the effect that a variable (an explanatory variable) may have on some phenomenon (the response) by controlling the conditions of the study. In an **experiment** the researcher controls the conditions by allocating individuals to groups (ideally **randomly**) and giving each group different conditions (different values of the explanatory variable). The different condition given is called the **treatment**. By **randomly** putting people in groups, this attempts to make the characteristics of each group very similar to each other so that if each group was given the same **treatment** the groups should respond in a similar way, on average. **Experiments** usually have a control group, a group that receives no treatment or receives an existing or established treatment. This allows any differences in the response, on average, between the control group and the other group(s) to be visible. When the groups are similar in all ways apart from the treatment received, then any observed differences in the response (if large enough) among the groups, on average, is said to be **caused** by the **treatment**. **Experiments** are the only study where a **causal claim** can be made.

Observational Studies are studies which a researcher attempts to understand the effect a variable (an explanatory variable) may have on something (the response variable), but the researcher cannot control conditions in the study. The researcher can observe what is going on, but cannot control what is happening (cannot control the explanatory variable). Because the groups in the study are made by what just what happened to happen, and not by **randomisation**, there may be other variables as well that are influencing which group people end up in. Therefore **causal claims** cannot be made, as the differences could just be due to the makeup of the groups.