

## Understanding the design of your study

The design of your study and the way you chose your sample can influence how you need to do your analysis. You should note either of the following:

- 1. Did you do the same measurement on each of your units more than once?**

For instance, you may have taken the heart rate of several runners both before and after a sprint, or you may have measured the RPMs of a collection of motors in each of their four gears. If so, you have done a **repeated measure**. This will influence how you use the flowchart.

- 2. Did you use a tiered sampling method for choosing your units?**

For instance, a study about schoolchildren in the UK may have chosen 20 students from each of 10 schools in each of 30 towns. In this case, town, school and student are three different sampling levels. If your sampling level is tiered, then all but the bottom level (here, student) must be included in your analysis as a **random effect predictor variable**.

More generally, you need to be aware of any aspect of the design that makes your measurements not independent. In the case of repeated measures, the various measurements done on the same unit are not independent because they have all been done on the same unit rather than on different units. In the second case, the measurements on students from a certain school are not independent because the students were not randomly chosen from the population of all students, but were instead taken all from the same school. There are other ways that measurements can fail to be independent. If you are not sure, ask a consultant.