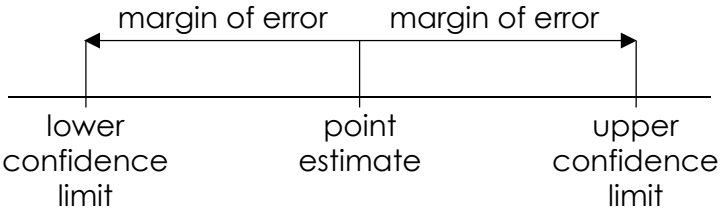
Part 5: Margins of Error

One of the things we need to be able to do is test how reliable a claim is that is made in the media. There are three types of claim that we need to be familiar with, and identifying which type of claim we are looking at is really important.

The reason we have a margin of error is because we have taken a sample. A sample is never going to perfectly represent the population, so we need to allow for this in our claims. The bigger the sample size is, the more reliable the estimates we get from it are likely to be. For example if we ask a group of 10 people we are likely to be a lot less certain than if we ask a group of 100, or 1000.

It can be helpful to visualise the margin of error like this:



The **point estimate** is what we get from our sample, and the **margin of error** is how much we expect the **point estimate** to be out by. This means we can be reasonably confident the value for the population is between the **lower confidence** limit and the **upper confidence** limit.

There are three types of claims that we look at:

- **No** comparison (1 group). This is where we get given a statement like "55% of people think that …."
- Comparison within **1 group**. This is where we are comparing two answers within one question asked to one group. For example "15% more people think … than …"
- Comparison between **two independent groups**. This is where we have asked two separate groups a question. For example "15% more boys think … than girls."

For each of these claims there is a different formula we use, and a different interpretation.

There are two rule that always hold true though:

- **The bigger the sample, the smaller the margin of error**. This is really important to remember. The reverse is also true, **the smaller the sample, the larger the margin of error**.
- The rules only work if the percentage from the sample is **between 30% and 70%.** That is because the rules are based on 50%, and from around 30% to 70% they are still pretty close, outside of that range the margin of error is **smaller**. This is because the further away from 50% you get the smaller the margin of error.