

Part 5.1: No Comparison

The first type of claim we look at is where we are given a claim with no comparison. This could be something like "the majority of ..." or "55% of people...".

The "rule of thumb" formula for the no-comparison 95% margin of error is

$$\frac{1}{\sqrt{n}}$$

where n is the sample size.

This formula only works when the percentage in the sample is between **30% and 70%**. Outside of this range the margin of error is **smaller**. You cannot use this formula if the percentage is outside this range.

If you want to play around with seeing where this formula comes from see the simulator used in the videos here: <https://www.mathsnz.com/resources/files/3.12/moe>

Let's look at an example for when there is no comparison: "Majority of French no longer see US as trusted ally, poll finds".

We are given some more information as well:

- The survey questioned 1,007 people
- 44 percent said the US was a "trusted ally"

Source: <https://www.france24.com/en/20180912-more-half-french-people-think-usa-trump-no-longer-trusted-ally-ifop-survey>

Alternative Link: <https://students.mathsnz.com/3.12/pdfs/Article9.pdf>

Note: we are ignoring the fact this was an online poll for the sake of this question.

Looking at this we can see 44% of people surveyed said the US was a "trusted ally", by inference then 56% of people do not. We need to see if the 56% from the sample is actually enough for us to conclude that there is a majority (more than 50%) back in the population.

There are four things we need to do now:

- **Find the margin of error:** $\frac{1}{\sqrt{1007}} = 0.0315$ (3sf) = 3.15%.
- **Construct the confidence interval:** $56\% \pm 3.15\% = (52.9\%, 59.1\%)$
- **Interpret what this means:** We can say, with 95% confidence, that the percentage of French who do not see the US as a trusted ally is somewhere between 52.9% and 59.1%.
Note: The phrase "we can say, with 95% confidence," doesn't have to be stated that way, but we do need some indication of uncertainty, as we can't be 100% confident about the values. We could also say something like "It is a fairly safe bet that..." or "I'm pretty sure..."
- **Make a judgement:** The percentage of French who don't see the US as a trusted ally could only be as low as 52.9%, and so this confidence interval does support a claim of over 50% as implied by the "majority" statement in the article.

It is **really important** that you keep these last as two separate sentences, as that is something the markers have specifically said, as often when people combine them into one sentence they end up mixing up the two.