Hypothesis Testing

Statistical Hypothesis Testing

Starting Point:

We have two hypotheses:

You could also ask, is the population mean equal to 80kg?

We usually shorten our statements to:

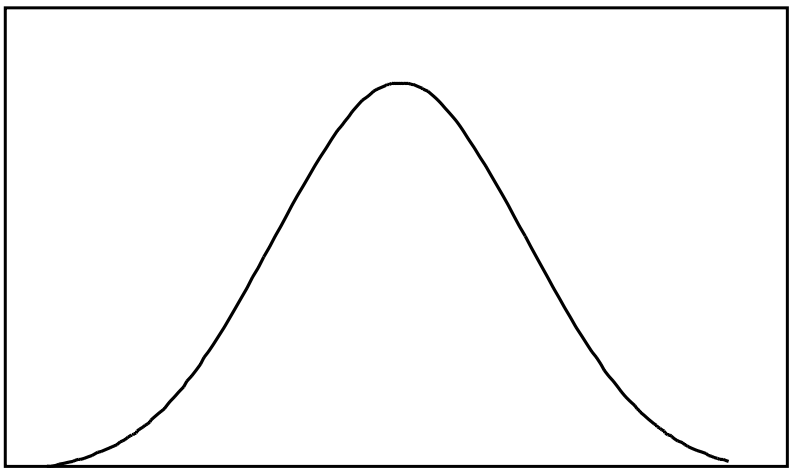
Important points …

In other words…

- Does the sample we've collected come from a population with a mean = μ ?

In practice …

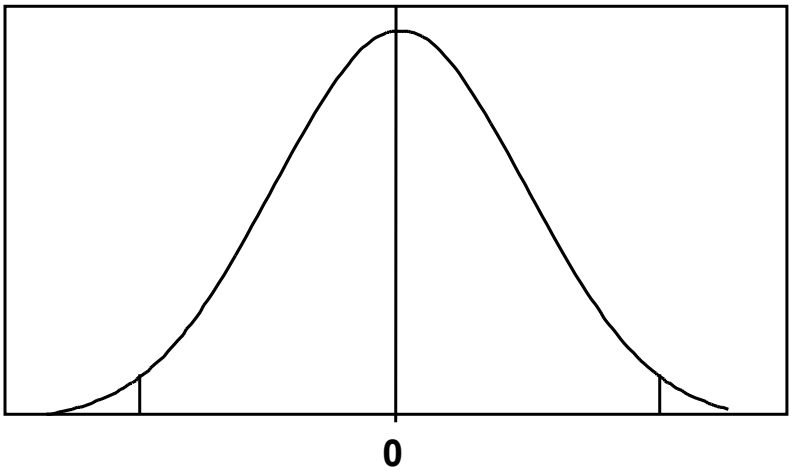
- We never measure/count/… every individual from a population, conclusions about the population



With regard to hypotheses…

A formal test

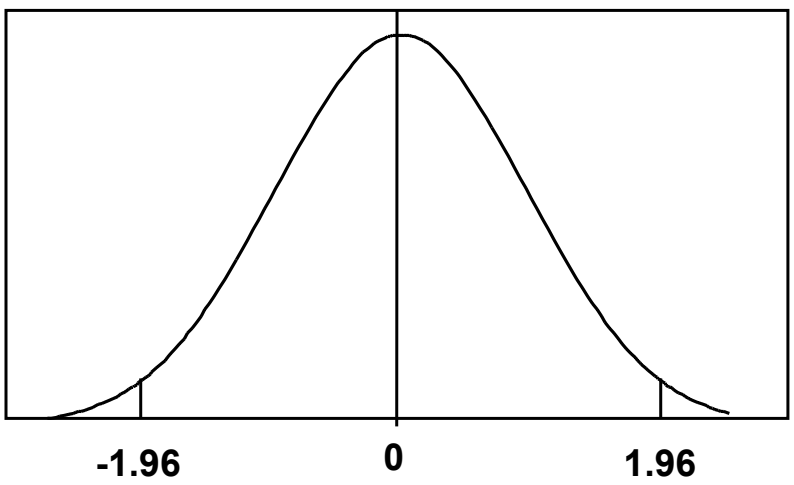
- We can use our Z to do a formal test



An example

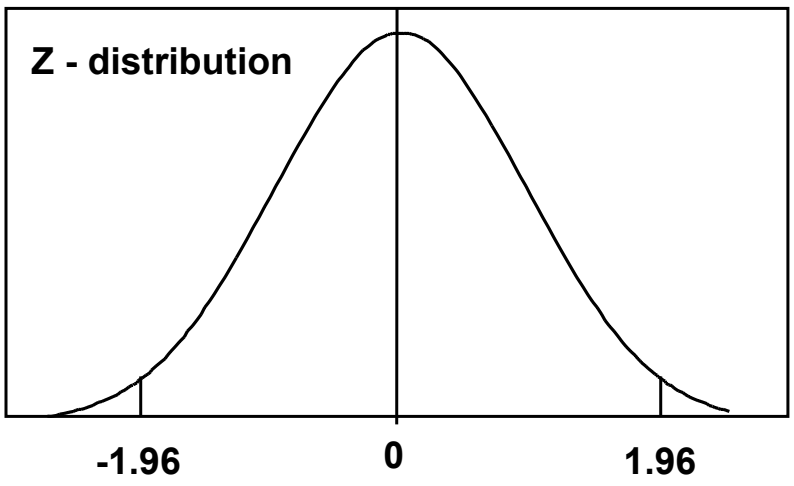
- CO detectors must sound an alarm at 10mg/m^3
- A CO detector manufacturer has sampled 18 of his CO detectors from the assembly line.
- Record the CO concentration at which the alarm sounded

10.25	10.54
10.37	10.33
10.66	10.48
10.47	10.68
10.56	10.40
10.22	10.39
10.44	10.26
10.38	10.32
10.63	10.54



Alternatively ...

- Could ask what is the



Therefore the probability …

- of getting a |Z| of that value or more extreme is
- And we

--> Why did we use both ‘tails’ in our test?

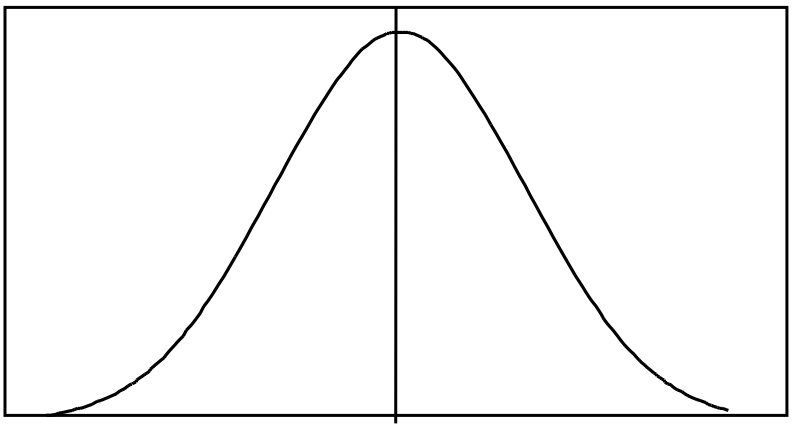
We were concerned with knowing

We didn’t really care if they were

We could have phrased our question differently.

Really, as consumers, we want to know if the alarm goes off at a concentration that is too high for safety.

So, instead of asking ‘are the values from 10 mg/m^3?’ you would as ‘are the values than 10mg /m^3?’



One tailed hypotheses …

look slightly different.

Previously, we saw that

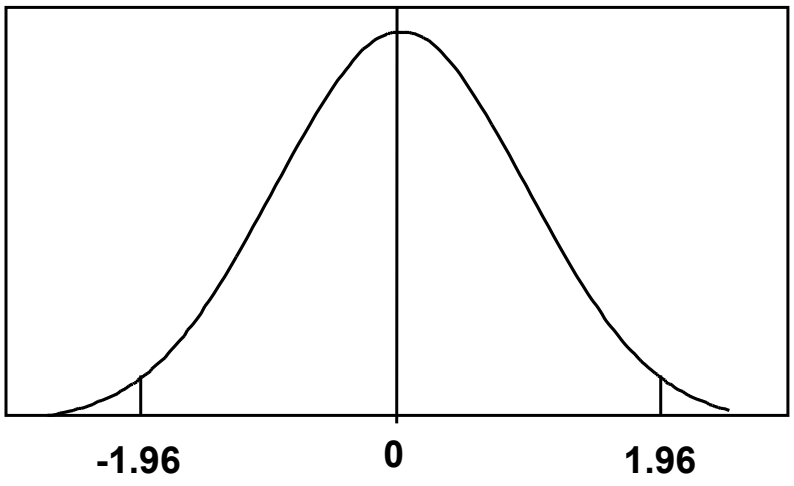
- the probability of $Z \geq 1.784$ was 0.037

$0.037 < 0.05$,

therefore, your H_o, the value is

Mistakes happen!!!

- We use 0.05 or 5% as our criterion
- The corresponding Z-value is 1.96 - called the critical Z.



		The Truth	
		H_o is true	H_o is false
What your data say	H_o is rejected	Type I Error	No Error
	H_o is not rejected	No Error	Type II Error