

Review

Remember to go over
In Class Exercise

Confidence Intervals

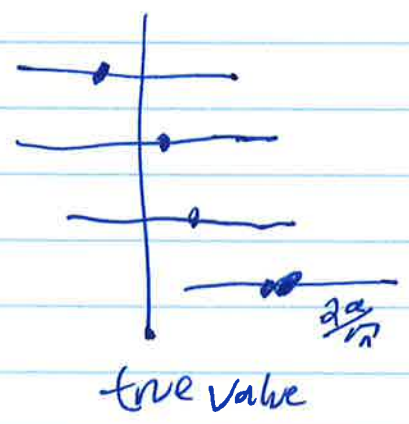
From the sample we can't infer the exact value of the parameters.

But: If certain assumptions hold we can "locate" the parameter within an interval (called a confidence interval)

Our interval won't be "right" (won't contain the true value of the parameter) every time.

But we can control the percentage of times the interval is right. This is called the confidence level: traditionally 75%

A 95% confidence interval means that if you repeat the experiment with new data many times, each time generating a new 95% confidence interval from data then 95% of the time the parameter will be inside the interval



intervals vary with data
 center of interval is \bar{x}
 for that data. width
 is $\frac{4\sigma}{\sqrt{n}}$ by 68-95-99.7
 Rule } maybe talk about this later (all next page)

Each time we collect data we get a new confidence interval

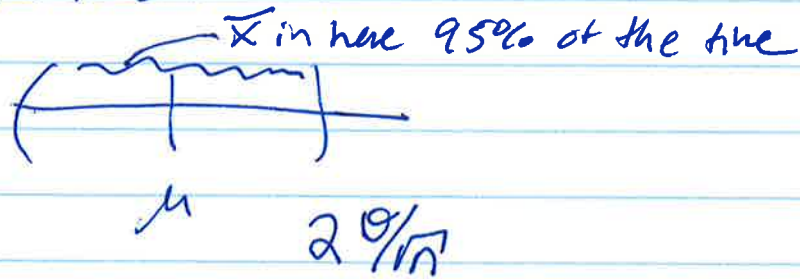
Once the confidence interval is chosen, it either does or doesn't contain the parameter

So if confidence interval is (3, 4) you don't say ~~P(3 ≤ μ ≤ 4) = .95~~

You say you are 95% confident 3 ≤ μ ≤ 4

2 1/2

The mean falls within 2 standard deviations from μ



both cases ~~width~~ width is $4\sigma/n$
margin of error is $2\sigma/n$

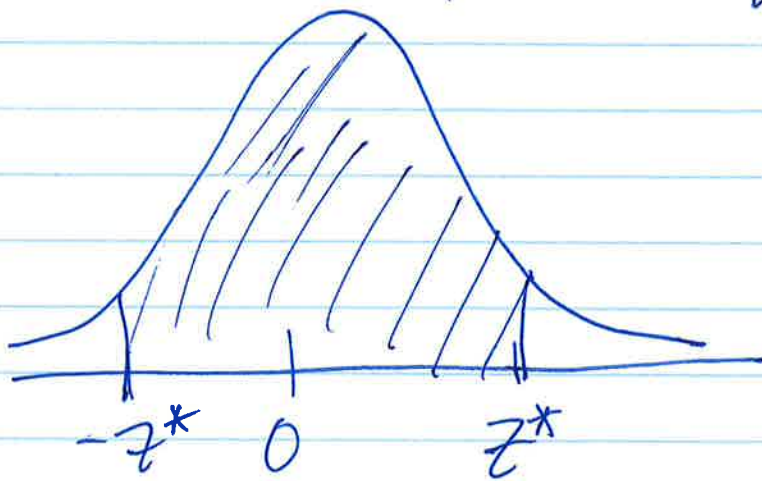
At 95% confidence level:

Confidence intervals have form

$$\bar{X} \pm z^* \frac{\sigma}{\sqrt{n}}$$

\uparrow \uparrow
 estimate \pm margin of error

This confidence interval is based on the z-test (assumes you know σ)



z^* chosen so that area equals confidence level (ie .95 for 95%)

\bar{X} is within 1 margin of error from μ w/ a fraction C of the

Thus μ is within 1 margin of error from \bar{X} same fraction of the.

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State Church