

Section 10.1: Estimating with Confidence

Thursday, April 04, 2024 1:17 PM

chapter 10 is on "confidence interval"

statistical inference: making estimates or predictions about a population based on a sample

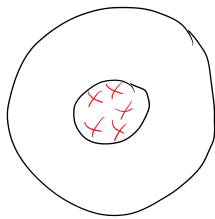
example: Globe and Mail newspaper polls 1000 Canadians, and based on this poll, says

"68% of Canadians want ..."

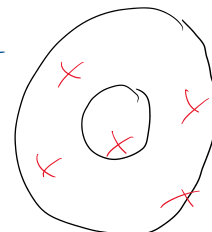
↑
did they measure all Canadians?
no! this is an estimate, based on their sample

precision versus accuracy:

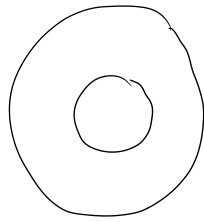
precise
and
accurate



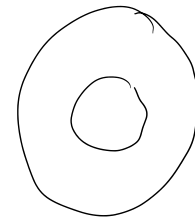
accurate
but
not
precise



precise
but
not
accurate



xx
xxx



neither precise
nor accurate

x
x
x
x

how do you get good accuracy?

- you make sure that as much as possible that your sample represents the population

how do you get good precision?

- good measuring instruments and a large sample size?

example:

you measure a sample of adult Chinook salmon (type of fish) and you find that the mean length is 75 cm.

what can you say about the entire population of adult Chinook salmon?

answer: if your sample is representative (which we're going to assume from now on), you can estimate that the mean length of all adult Chinook

now on), you can estimate that
the mean length of all adult Chinook
salmon is about 75 cm

↑
but what does this mean?

do we mean

75 cm \pm 1 cm? from 74 to 76 cm

75 cm \pm 10 cm? from 65 to 85 cm

↑

interval

and in the
next section, we will
learn how to calculate this

but is it also not true that occasionally
the sample may contain an outlier?
or have more individuals above
the mean than below it?

occasionally, your sample will not
predict the population accurately
due to random variation

how do we handle this? we say something
like:

"Based on our sample, we have determined
the mean length of adult Chinook
salmon is between 65 and 85 cm"

salmon is between 65 and 85 cm
with 95% confidence