

CONFIDENCE INTERVALS

Working with Quantitative Data

(You are measuring each individual in the sample)

Example: What is the mean length of all fish in a huge lake?

We take a random sample and determine:

n = sample size

\bar{x} = sample mean

S_x = sample standard deviation

Let's say that:

$n = 50$ *

$\bar{x} = 17.3$ cm

$S_x = 2.1$ cm

* Note that $n \geq 30$, which is a condition that must be met in order for us to find a confidence interval for the population mean.

For this example, construct a 95% confidence interval for the population mean. Explain the meaning of this confidence interval.

95% C.I.:

(16.7 cm, 17.9 cm)

We can be 95% confident that the interval from 16.7 cm to 17.9 cm encloses the true mean length of all fish in this lake.

Working with Binary Data

(You are placing each individual in the sample in one of two categories)

Example: What proportion of all fish in a huge lake are trout?

We take a random sample and determine:

n = sample size

x = number of individuals in the sample that fall into a particular category

Let's say that:

$n = 1000$ *

$x = 412$ trout

* Note that $N/n \geq 20$ is a condition that must be met in order for us to find a confidence interval for the population proportion (so there must be at least 20 000 fish in this lake).

For this example, construct a 95% confidence interval for the population proportion. Explain the meaning of this confidence interval.

95% C.I.:

(38.1%, 44.3%)

We can be 95% confident that the interval from 38.1% to 44.3% encloses the true proportion of all fish in this lake that are trout.