

3.2 Among 100 fish caught in a certain lake, 18 were inedible as a result of the chemical pollution of the environment. Construct a 99 percent confidence interval for the corresponding true population proportion.

We want a 99% Confidence Interval for a proportion

$$\alpha = 0.01$$

$$\hat{p} - E < P < \hat{p} + E$$

$$E = Z_{\frac{\alpha}{2}} \sqrt{\frac{\hat{p}\hat{q}}{n}}$$

Sample Data

$$n = 100$$

$$x = 18$$

$$\hat{p} = 18/100$$

$$= 0.18$$

$$\hat{q} = 0.82$$

$$0.18 - E < P < 0.18 + E$$

$$E = 2.575 \sqrt{\frac{(.18)(.82)}{100}} \approx 0.0989$$

<b>0.081 &lt; P &lt; 0.279</b>
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We are 99% confident that the true population proportion is between 8.1% and 27.9%.

STUDY: Chapter 6: Section 6.4

- Estimating a Population Proportion