



ASQ CRE Prep course

Lesson II. B. 2. b.

Statistical Interval Estimates

About MTBF Estimates

A wide-angle photograph of a tropical beach. The foreground is sandy, with a large, weathered log lying horizontally. To the left, there's a small, green, scrub-covered hill. The middle ground shows the ocean with a clear, turquoise-colored lagoon meeting a darker blue sea. The sky is a deep blue with scattered, wispy white clouds.

Time to failure data

MTBF CONFIDENCE INTERVALS

With Type I Censoring

- Test run for 250 hours
- 4 failures occurred (with replacements)
- What is lower CI and 2-side CI
- Use 90% confidence

$$\frac{2T}{\chi_{\alpha, 2r+2}^2} \leq \theta$$

$$\frac{2T}{\chi_{\frac{\alpha}{2}, 2r+2}^2} \leq \theta \leq \frac{2T}{\chi_{\frac{1-\alpha}{2}, 2r}^2}$$

With Type II Censoring

- 4 units tested end with first failure
- 1 failure occurred at 250 hours
- What is lower CI and 2-side CI
- Use 90% confidence

$$\frac{2T}{\chi_{\alpha, 2r}^2} \leq \theta$$

$$\frac{2T}{\chi_{\frac{\alpha}{2}, 2r}^2} \leq \theta \leq \frac{2T}{\chi_{1-\frac{\alpha}{2}, 2r}^2}$$

Thus we
generally want
more samples



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Lesson II. B. 3. a.

Hypothesis Testing

The Process