Figure 13.1. QUANTIFYING UNCERTAINTY: Confidence Intervals

Section headings (and subheadings) to provide a content overview

1. An Illustration of a Measuring Process – the Mass of NB10 (pages 13.1 and 13.2)
2. A Confidence Interval for μ Representing the (true) Mass of NB10 (pages 13.2 and 13.3)
3. Understanding Confidence Intervals for a Model Mean Representing a Population Average (pages 13.3 to 13.10)
   1. Interpretation of a CI
   2. The value used for the confidence level
   3. Interpretation of the confidence level
   4. Factors affecting the width of a CI for the model mean μ representing the population average $\overline{\mathbf{Y}}$
   5. CI numerical coefficients from the t_ν instead of the $G(0,1)$ distribution
   6. Modelling assumptions underlying the CI derivation

   Example 13.1.1
   Example 13.1.2
4. Modelling a Measuring Process which *has* Inaccuracy (pages 13.10 to 13.12)
   1. Calibrating a measuring process to quantify measuring inaccuracy
   2. A CI for the mean μ representing the population average $\overline{\mathbf{Y}}$ calculated from inaccurate measurements
5. Calculating a Sample Size in the Plan for an Investigation to Estimate $\overline{\mathbf{Y}}$ (page 13.12)
   Specifying imprecision by *interval width*
   Specifying imprecision by *interval half-width*
   Specifying imprecision by *the standard deviation of* $\overline{Y}$
6. Appendix 1: t_ν Distribution History (pages 13.12 and 13.13)
7. Appendix 2: Least Squares Estimating (pages 13.13 and 13.14)
8. Appendix 3: t_ν Distribution Theory (pages 13.14 to 13.16)
   The χ^2_ν distribution
   The K_ν distribution
   The distribution of $\tilde{\sigma}$
   The t_ν distribution
   The distribution of $\tilde{\mu}$
9. Appendix 4: A Confidence Interval for σ representing $\mathbf{S}$ (and for σ^2 representing $\mathbf{S}^2$) (pages 13.16 and 13.17)
   Example 13.1.3
10. Appendix 5: The International Reference Kilogram (pages 13.17 and 13.18)

Ten tables

Twenty-one diagrams

Forty-five equations (plus four repeats)