

CONFIDENCE INTERVALS: Quantifying Sampling (and Measuring) Imprecision (for some types of Questions)

Section headings to provide a content overview

1. An Illustration of a Measuring Process – the Mass of NB10
 2. A Confidence Interval for μ Representing the Mass of NB10
 3. Understanding Confidence Intervals for a Model Mean Representing a Population Average
 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 \bar{Y}
 5. CI numerical coefficients from the t_ν instead of the $N(0,1)$ distribution
 6. Modelling assumptions underlying the CI derivation
 - Assumption 1
 - Assumption 2 – sampling
 - Assumption 2 – measuring
 - Assumption 3
 - Example HL2.1
 - Example HL2.2
 4. Modelling a Measuring Process which *has* Inaccuracy
 1. Calibrating a measuring process to quantify measuring inaccuracy.
 2. A CI for the mean μ representing the population average \bar{Y} calculated from inaccurate measurements
 5. Calculating a Sample Size in the Plan for an Investigation to Estimate \bar{Y}
 - Specifying imprecision by *interval width*
 - Specifying imprecision by *interval half-width*
 - Specifying imprecision by the *standard deviation of \bar{Y}*
 6. Appendix 1: t_ν Distribution History
 7. Appendix 2: Least Squares Estimating
 8. Appendix 3: t_ν Distribution Theory
 - 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)
 - Example HL2.3
 10. Appendix 5: The International Reference Kilogram
- Ten tables
Twenty-one diagrams
Forty-five equations