Reasons for No Longer Teaching the Normal Approximation Confidence Interval

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A typical, modern-day introductory statistics textbook teaches normal approximation confidence interval formulas for use with large samples and exact formulas for small samples. Other than tradition, there is no compelling theoretical, practical, historical, or educational reason for calculating confidence intervals using relatively inaccurate normal-distribution approximation formulas instead of exact ones based upon exact distributions (Student's *t* for variable data, and binomial for proportions). Although ease-of-calculation for large sample sizes was a valid concern many decades ago, that is no longer the case, given the present-day availability of statistical software, statistical functions in electronic spreadsheets, and textbooks with tables covering degrees of freedom greater than 30. In this 21st century, normal approximation formulas are way past their expiration dates and are a liability to 21st century students who work in a world where product quality is no longer measured in defects per thousand but in defects per billion.

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