Hellenic Complex Systems Laboratory

Exact Confidence Intervals for a Single Proportion

Technical Report XVI

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Exact Confidence Intervals for a Single Proportion

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Search Terms: proportion, confidence interval, exact method, *F* distribution, inference

Short Description of the Demonstration

This Demonstration shows calculations of point estimations and confidence intervals for various single proportions of populations obeying a condition (or trait), as well as their plots versus *p*-value. This is done for differing populations obeying and violating a condition (or trait) and differing *p*-values for estimating the lower and upper bounds of the confidence intervals.
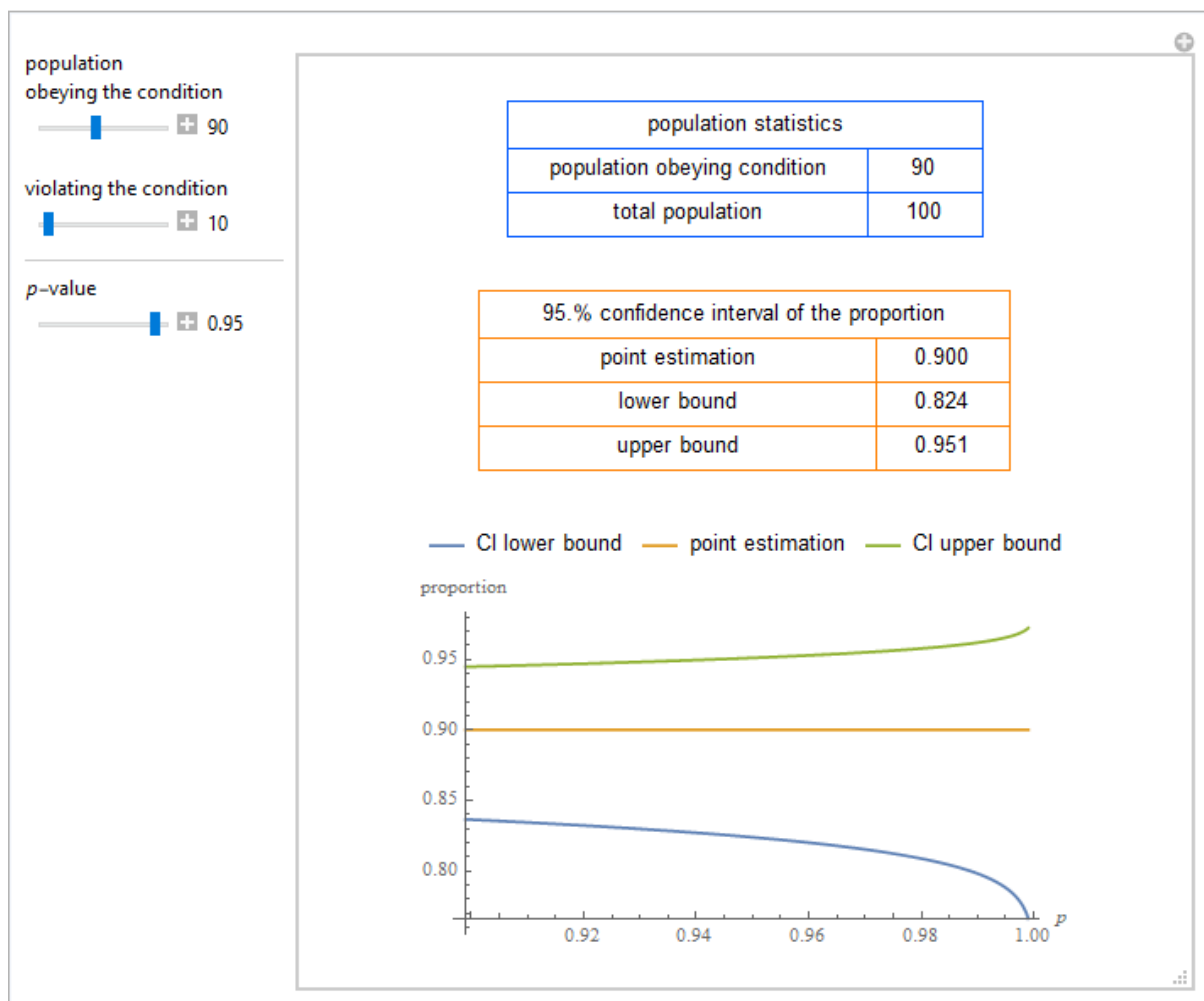
Figure 1: *Population statistics, point estimation, and 95% confidence interval for a single proportion of a population obeying a condition, as well as their plots versus p-value, with the settings shown at the left.*
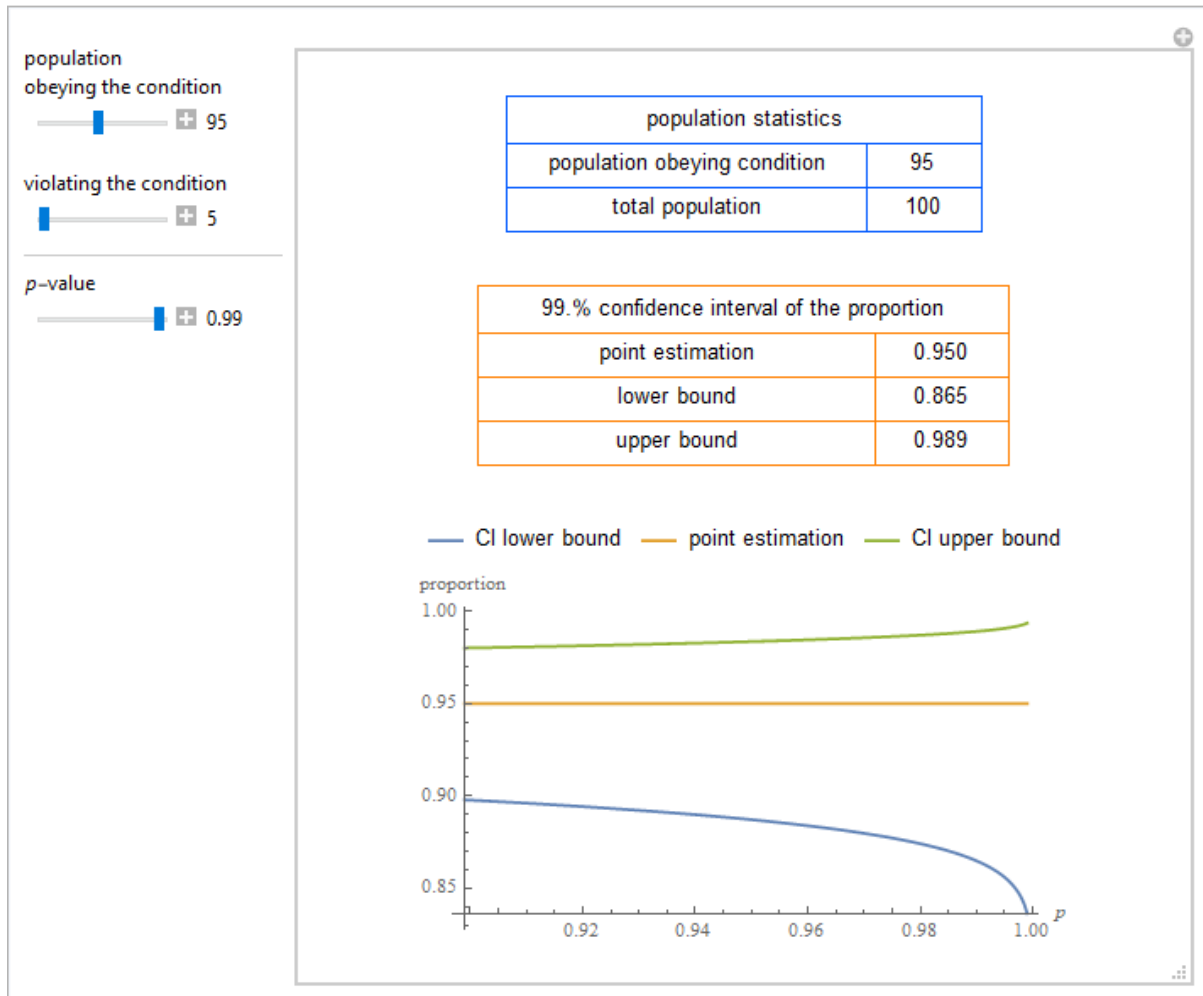
Figure 2: *Population statistics, point estimation, and 99% confidence interval for a single proportion of a population obeying a condition, as well as their plots versus p-value, with the settings shown at the left.*
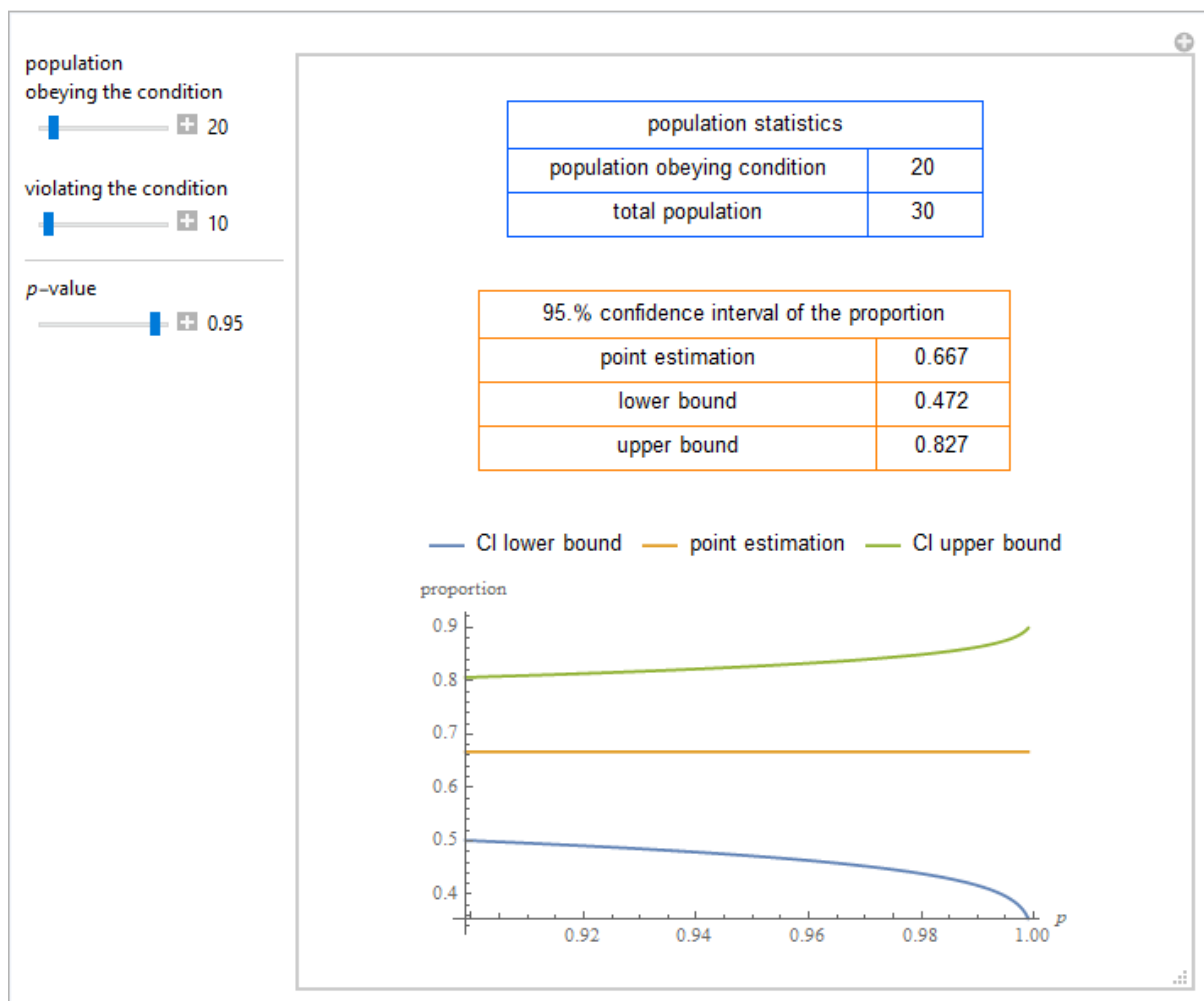
Figure 3: *Population statistics, point estimation, and 95% confidence interval for a single proportion of a population obeying a condition, well as their plots versus p-value, with the settings shown at the left.*
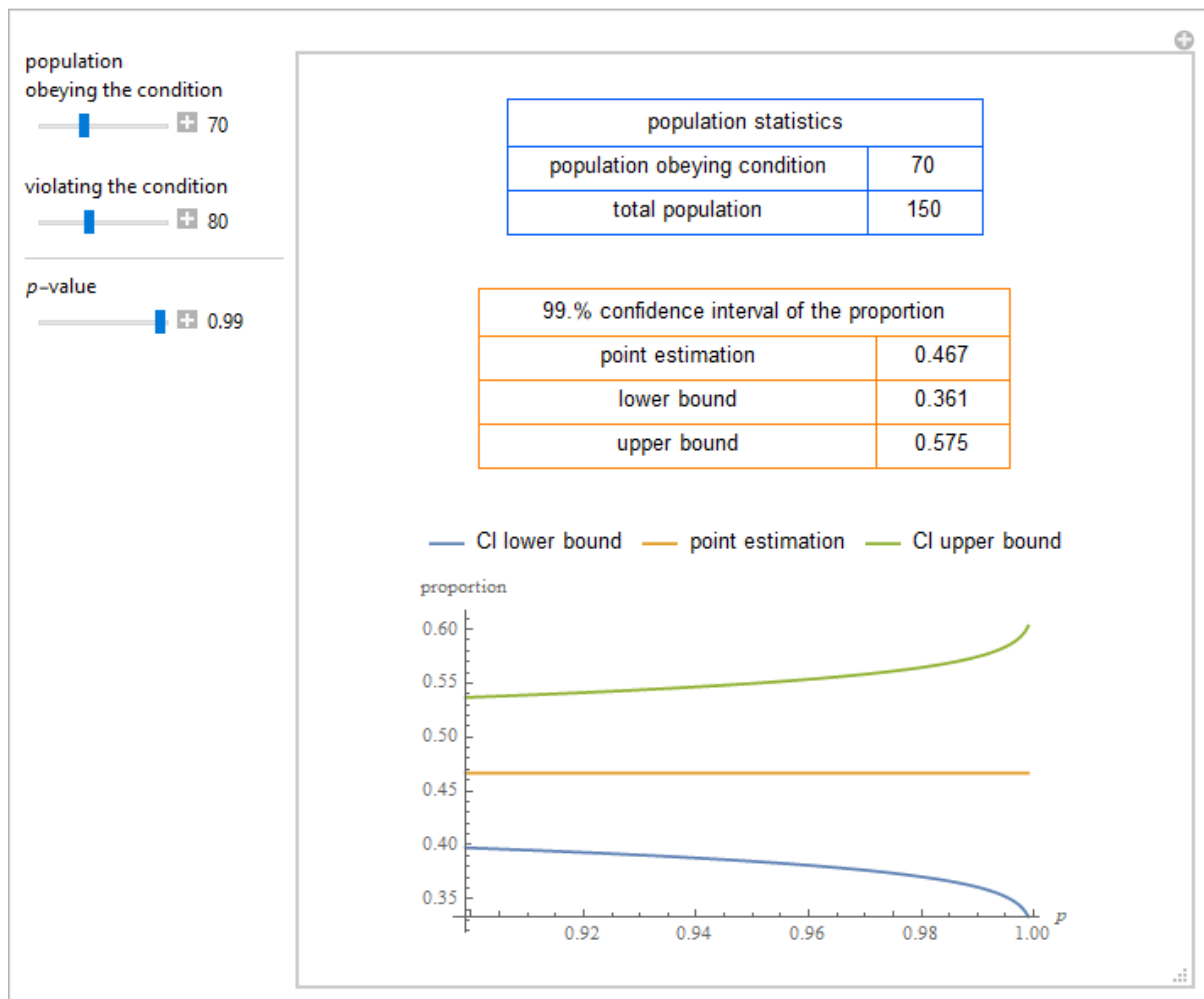
Figure 4: *Population statistics, point estimation, and 99% confidence interval for a single proportion of a population obeying a condition, as well as their plots versus p-value, with the settings shown at the left.*

Details

The exact method using the *F*-distribution is applied for calculating the confidence interval of each single proportion [1].

Reference

[1] J. L. Fleiss, B. Levin and M. C. Paik. Statistical Methods for Rates and Proportions*,* 3rd ed., Hoboken, NJ: J. Wiley, 2003.

Source Code

The updated Wolfram Mathematica© source code is available at:

https://www.hcsl.com/Tools/ExactConfidenceIntervalsForASingleProportion-author.nb

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