Hellenic Complex Systems Laboratory

Exact Confidence Intervals for a Single Proportion

Technical Report XVI

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WOLFRAM Demonstrations Project

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 confidence limits.

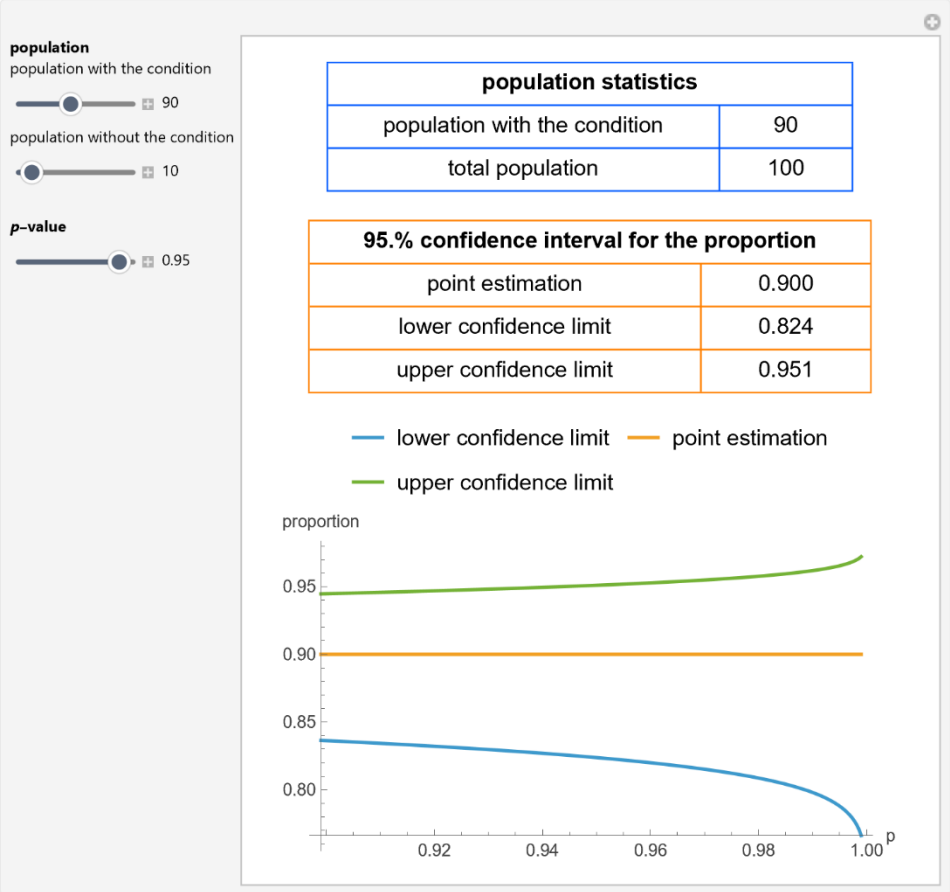

Figure 1: *Population statistics, point estimation, and 95% confidence interval for a single proportion of a population obeying a condition, as well as their plots versus p-value, with the settings shown at the left.*

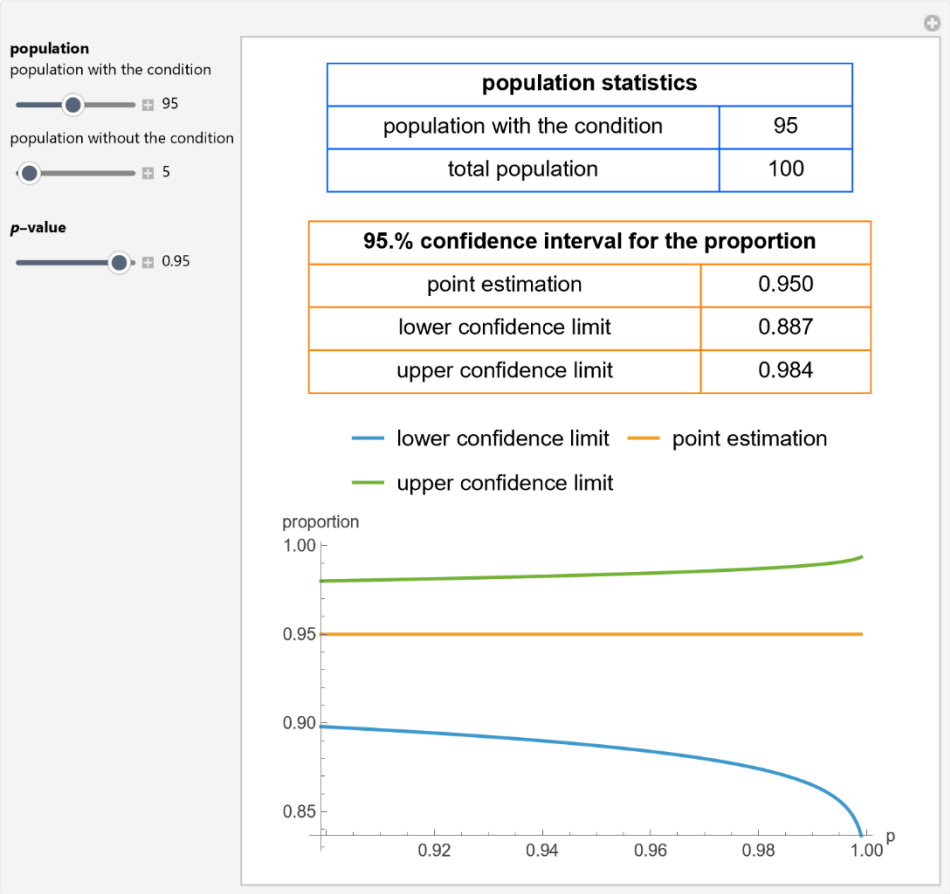

Figure 2: *Population statistics, point estimation, and 99% confidence interval for a single proportion of a population obeying a condition, as well as their plots versus p-value, with the settings shown at the left.*

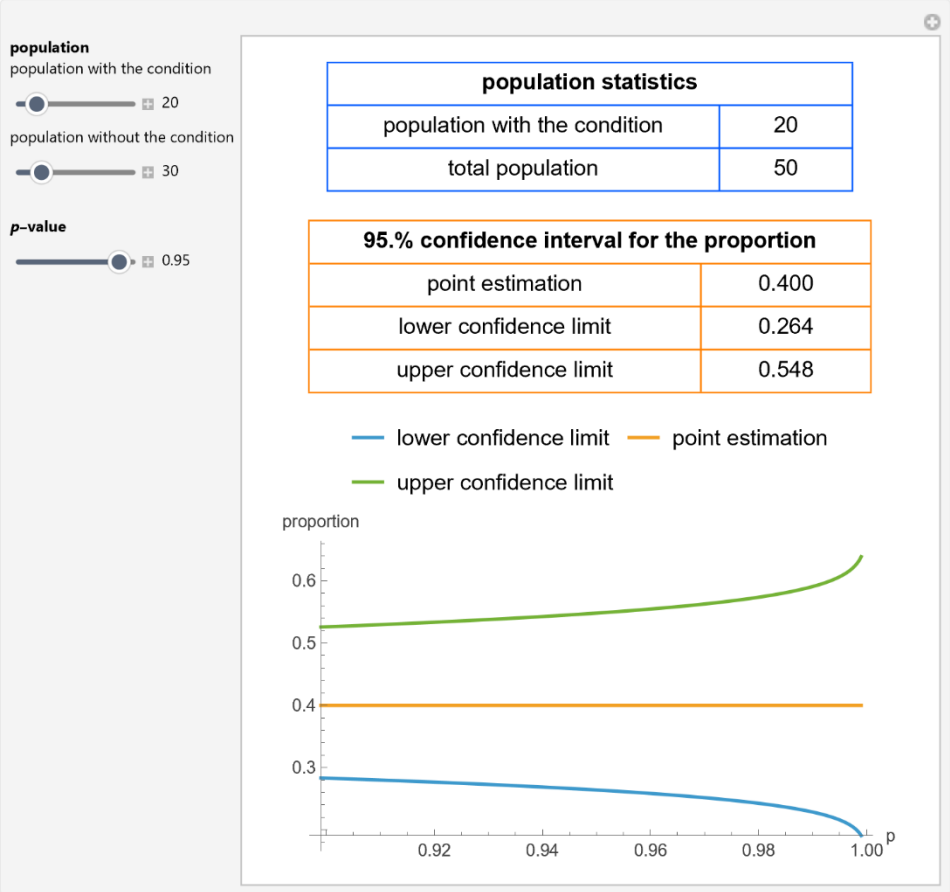

Figure 3: *Population statistics, point estimation, and 95% confidence interval for a single proportion of a population obeying a condition, well as their plots versus p-value, with the settings shown at the left.*

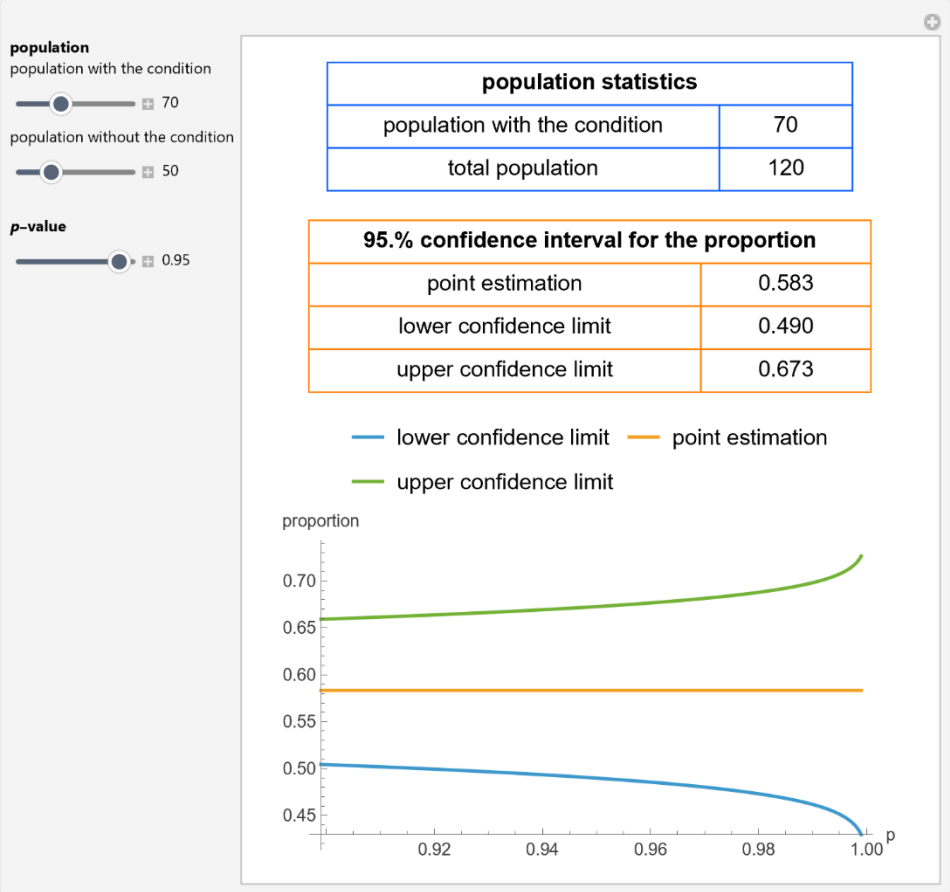

Figure 4: *Population statistics, point estimation, and 99% confidence interval for a single proportion of a population obeying a condition, as well as their plots versus p-value, with the settings shown at the left.*

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

Programming language: Wolfram Language

Availability: The updated source code is available at:

https://www.hcsl.com/Tools/Demonstrations/ExactConfidenceIntervalsForASingleProportion.nb

Software Requirements

Operating systems: Microsoft Windows, Linux, Apple macOS and iOS

Other software requirements: Wolfram Player®, freely available at: https://www.wolfram.com/player/ or Wolfram Mathematica®.

System Requirements

Processor: x86-64 compatible CPU.

System memory (RAM): 4GB+ recommended.

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https://demonstrations.wolfram.com/CalculationOfDiagnosticAccuracyMeasures/

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