



Standard Practice for Acceptance of Evidence Based on the Results of Probability Sampling¹

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1. Scope

1.1 This practice presents rules for accepting or rejecting evidence based on a sample. Statistical evidence for this practice is in the form of an estimate of a proportion, an average, a total, or other numerical characteristic of a finite population or lot. It is an estimate of the result which would have been obtained by investigating the entire lot or population under the same rules and with the same care as was used for the sample.

1.2 One purpose of this practice is to describe straightforward sample selection and data calculation procedures so that courts, commissions, etc. will be able to verify whether such procedures have been applied. The methods may not give least uncertainty at least cost, they should however furnish a reasonable estimate with calculable uncertainty.

1.3 This practice is primarily intended for one-of-a-kind studies. Repetitive surveys allow estimates of sampling uncertainties to be pooled; the emphasis of this practice is on estimation of sampling uncertainty from the sample itself. The parameter of interest for this practice is effectively a constant. Thus, the principal inference is a simple point estimate to be used as if it were the unknown constant, rather than, for example, a forecast or prediction interval or distribution devised to match a random quantity of interest.

1.4 A system of units is not specified in this standard.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

¹ This practice is under the jurisdiction of ASTM Committee E11 on Quality and Statistics and is the direct responsibility of Subcommittee E11.10 on Sampling / Statistics.

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2. Referenced Documents

2.1 *ASTM Standards*:²

E105 Practice for Probability Sampling of Materials

E122 Practice for Calculating Sample Size to Estimate, With Specified Precision, the Average for a Characteristic of a Lot or Process

E456 Terminology Relating to Quality and Statistics

E1402 Guide for Sampling Design

E2586 Practice for Calculating and Using Basic Statistics

3. Terminology

3.1 *Definitions*—Refer to Terminology E456 for definitions of other statistical terms used in this practice.

3.1.1 *audit subsample, n*—a small subsample of a sample selected for review of all sample selection and data collection procedures.

3.1.2 *equal complete coverage result, n*—the numerical characteristic of interest calculated from observations made by drawing randomly from the frame, all of the sampling units covered by the frame.

3.1.2.1 *Discussion*—Locating the units and evaluating them are supposed to be done in exactly the same way and at the same time as was done for the sample. The quantity itself is denoted θ . The equal complete coverage result is never actually calculated. Its purpose is to serve as the objectively defined concrete goal of the investigation. The quantity θ may be the population mean, ($\bar{Y}$), total (Y), median (M), the proportion (P), or any other such quantity.

3.1.3 *frame, n*—a list, compiled for sampling purposes, which designates all of the sampling units (items or groups) of a population or universe to be considered in a specific study.

E1402

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.