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Design techniques for probabilistic sampling of items with variable monetary value. (English)

[Zbl 0946.62098](#)

Ghosh, Subir (ed.), Multivariate analysis, design of experiments, and survey sampling. A tribute to Jagdish N. Srivastava. New York, NY: Marcel Dekker. Stat., Textb. Monogr. 159, 55-68 (1999).

From the introduction: To ensure the quality of their output, organizations often face the problem of sampling items from a collection of different, possibly related, categories (for instance, different suppliers, or alternative production methods) with possibly very different monetary value within each category (for instance, the same supplier may produce simple electronic components and expensive chips).

We will consider situations where each of the items may be classified either as correct or as nonconforming (that is, failing to meet whatever requirements are established to qualify as correct). We will further assume that all items selected for inspection are correctly classified (so that any nonconforming item in the sample will be found), and that nonconforming items which are not sampled remain undetected. Under these conditions, we use Bayesian decision theory and hierarchical modeling to propose an inspection strategy designed to minimize the probable monetary value of undetected nonconforming items.

For the entire collection see [[Zbl 0927.00053](#)].

MSC:

- [62P30](#) Applications of statistics in engineering and industry; control charts
- [62F15](#) Bayesian inference
- [62C10](#) Bayesian problems; characterization of Bayes procedures

Keywords:

[inspection strategy](#); [probable monetary value of undetected nonconforming items](#)