

OPTIMAL INTEGRATION OF SURVEYS

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The problem of integration of surveys is known to be of considerable practical as well as theoretical interest in the design of multi-purpose and continuing surveys. The object of this paper is to present a brief review of current developments in this area and to furnish a unified framework within which integration of surveys can be studied from various angles.

Introduction

The problem of integration of surveys, i.e., the problem of designing a sampling program for two or more surveys which maximizes the overlap between observed samples is known to be of considerable practical as well as theoretical interest in the design of multi-purpose and continuing surveys (Keyfitz, 1951). Development of cost-efficient sampling programs of this kind is a problem which agencies such as the National Sample Survey of India, Statistics Canada, the U.S. Bureau of the Census, the U.S.D.A., and others worldwide, have been continuing to tackle on an ad hoc basis. And although the literature on it is now over 40 years old, basic research in it has reached a modest level of maturity only recent (cf. Arthanari and Dodge, 1981; Causey et al. 1985; Krishnamoorthy and Mitra, 1987; Maczynski and Pathak, 1980; and others). Nevertheless despite these recent gains, there remains a pressing need for a unified framework within which integration of surveys and other similar problems of this nature, such as controlled selection and controlled rounding (Goodman and Kish, 1950, and Causey et al., 1985), can be studied with all their ramifications. In due course, such an approach is bound to provide a powerful guide to the cost-efficient design of survey programs commonly encountered in practice. The primary object of this paper is to briefly review the contemporary work in this area from the theoretical as well as computational viewpoints.

In broad terms, integration of surveys can be referred to as the sampling program for two or more surveys. It has its origin in multipurpose surveys and sampling over successive occasions. In multipurpose surveys, the population characteristics under study are often subdivided into two or more groups of