

BOOK REVIEW

SAMPLING IN SWEDEN—CONTRIBUTIONS TO THE METHODS AND THEORIES OF SAMPLE SURVEY PRACTICE. By Tore Dalenius, Almqvist and Wiksell, Stockholm, 1957, pp. 247.

SEVERAL books on Sampling Theory [(i) Deming, (ii) Yates, (iii) Cochran, (iv) Hansen, Hurwitz and Madow and (v) Sukhatme] have appeared during the last few years. The present publication is however a welcome addition in that for the first time we have an authoritative account of the theory and practice of sample surveys as developed in Sweden. The author of the book has been associated with sample surveys for a long period and this work is based on his experience and contributions in this field.

There are in all 12 chapters, the first one being devoted to a concise review of the sample survey methods and theories now available in various texts mentioned above. The next two chapters give the development of the sample survey methods in Sweden and a description of a sample survey design developed by the author for the purpose of estimating the agricultural acreage and livestock numbers in Sweden. Chapter IV deals with organisational aspects of sample surveys and gives a broad review of the activities of the survey research centre of the Central Bureau of Statistics. The next chapter points out some of the shortcomings in the sample surveys as practised in Sweden. Chapter VI gives a general discussion of the frame problem, procedures employed to solve it, particularly in household surveys and the special frame problem in two stages sampling.

To the reviewer, Chapters VII, VIII, IX and X appear to be the most important contributions of the author to the theory of sample surveys. As the author has correctly pointed out, the use of stratified sampling involves four design operations:

- (a) Choice of stratification,
- (b) Choice of the number of strata,
- (c) Determination of the way in which the population is to be stratified, and
- (d) Determination of the sample size to be taken from each stratum.

While in actually planning a survey, considerable emphasis is given to all these aspects, the theory required to take a proper decision on these problems except in regard to the determination of the sample size is not available.

Chapter VII discusses the problem of determining the optimum stratification when stratification is carried out either on the variable under study or on a variable correlated with the one under study, both for finite and infinite populations. This is discussed for each of the three cases when the allocation of the sample size to be selected from the strata is proportional, Neyman and optimum. Lastly, the author discusses the problem of optimum stratification with reference to a special type of design particularly useful in sampling from a markedly skew population.

The next chapter considers the problem of determining the optimum number of strata in single stage stratified sampling designs for populations having simple frequency functions. Consequently the results obtained are of limited interest only, as they are not of a general applicability.

In sample surveys we are generally interested in estimating several characters whereas the theory developed so far is concerned mainly with estimating a single character. It may very often happen that the different characters to be studied make conflicting demands on the design. This important problem has not received much attention at the hands of research workers. Chapter IX is a contribution in this direction. The author first gives a brief review of the different procedures proposed by the other authors and then gives his own solution to the problem including one based on the technique of linear programming. It has also been shown how this technique can be used in two stage sampling designs.

The next chapter considers the important problem of designing a sample survey so as to estimate the total population parameter as also sub-population parameters with maximum precision. The author shows how the technique of linear programming can be used to solve this problem.

The problem of non-response has been treated in the next chapter. The reviewer is of the opinion that this subject which has increasingly come to occupy an important place in the planning of surveys has not received adequate attention in the book. A more detailed treatment

of the subject and an up-to-date list of references would have greatly enhanced the value of the chapter.

Finally, the last chapter discusses the scope for use of sample survey methods, the bearing of the problems involved on training statisticians and an outline of a desirable programme for theoretical and methodological research concerning sample surveys.

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