

Discussion

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The most important element, it seems to me, involves the purpose for which a sample is drawn or tabulations made, or statistics otherwise collected or processed. Once the questions are answered, "What will you do with the statistical findings? What action will you take?" we have a reasonable basis for deciding what type of sample to draw and how accurate it should be, or what type of tabulation equipment to use.

Mr. Marks' tripod is insufficient, it seems to me, as a basis for a sound sample. In addition to simplicity, good design, and good control, the purpose to be served by the statistics must be borne in mind. In this connection it seems to me that most purposes for which statistics will be used, especially in lesser developed countries, require knowledge of approximate levels, rather than highly exact information. For example, information that the ratio of female children under age five to women aged 15-44 is 100 children per 100 mothers establishes the fact that the birth rate is very high. Whether the exact ratio is 95 or 105 is irrelevant for any action purpose. Therefore, a sample should be accurate enough to establish the fact of a high birth rate, but need not be accurate to within one percent, or less, of the presumed "correct and true" ratio of children to women.

If you accept this emphasis on purpose to be served by the statistics, then, it seems to me, simplicity is of very great importance, especially in lesser developed areas where there may be shortages of qualified clerical and statistical workers. Simple procedures which can be followed even by semi-literate clerks and control procedures which a poorly educated supervisor can follow, become of overriding importance.

I emphasize simplicity even at the expense of "good sample design" if necessary. The design need be good enough only to provide a reasonably good estimate of the level of the statistic commensurate with the purposes for which the statistics are to be used. If the sample is so designed as to provide the best possible estimate of the complete universe from which it was drawn, and as a result the procedures required to handle it are not as simple as they might otherwise be, that design is not

good, in my opinion.

I apply the same reasoning to the use of computers and other ultra-modern tabulation equipment, as reported in Mr. MacPherson's paper. If one must tabulate the census for all the 100 or 200 million or more people in a country, it is certainly desirable to have the most modern tabulation equipment. However, if the uses to which the statistical results are to be put, can be served by tabulating information for as few as one-half million people, then less emphasis and importance need be attached to the nature of the tabulation equipment. One-half million cases can be tabulated with semi-modern equipment, if need be, (and taking into consideration the skills of the operating personnel available and the funds available for purchasing equipment). I submit that in very many cases, in the majority of cases, the final purposes to be served by the statistics, can be had by tabulating a small sample of all the cases. Therefore, I am not unduly worried by the nature of the tabulation equipment which might be utilized.

In short, I am emphasizing the necessity to think through problems and their possible solutions. I do not believe that one can depend on "tried and true text book" methods, nor on inanimate machinery, to do the basic thinking necessary. I admit, however, that if homo sapiens will not think, then automatic procedures - learned or operated by rote - are preferable to no procedures.

As for Mr. Booker's paper, I am glad to see that he updated a few of the statistics presented in the United Nations document Patterns of Industrial Growth, 1938-1958, prepared by Mr. A. Aidenoff (1960). Mr. Booker's emphasis on the fact that measuring change in terms of percentage increase, or decrease, often exaggerates the true situation, is excellent; one must examine the absolute values (of income, employment, etc.) and absolute changes in such values before one can determine how much "progress" is actually being made in a country.

For a fuller and more complete description of what has transpired in the fields of production and employment during the past two decades, this discussant recommends the volume, Patterns of Industrial Growth.