TECHNICAL ATTACHMENT

Why the Result of a Sample Can Be More Accurate than the Result of a Census

That a sample result can be more accurate than a census result is not intuitively obvious. After all, a census result is subject only to measurement errors whereas a sample result is subject to both measurement errors and sampling errors - that is, errors also occur because only a portion of the population is being studied in the sample. To see why a sample result can be more accurate than a census result, consider the 10 percent of the housing units of, say, a county who do not respond to the initial census enumeration. A census enumeration of the non-responding housing units will be subject to a variety of measurement errors -- some respondents will be entirely missed, information for others from secondary sources will be incorrect, etc.

Should a more effective enumeration method be available, although at a higher cost per respondent, a sample using this more effective enumeration method may be selected at the same total cost, or at a lower total cost, as for the standard enumeration of the 10 percent of the population remaining. It may then be found that the reduction in measurement errors achieved with the more effective enumeration method may more than compensate for the presence of sampling errors when a sample of the 10 percent of the population remaining is utilized. If funding were available, it might be preferable to employ this more effective enumeration method for the entire population, but realistically it would be employed it only where it is most needed.

The achievement of greater accuracy depends on how much more accurate the refined enumeration procedure is than the standard procedure and how much greater is its cost. These factors need to be evaluated for each specific case to determine the comparative accuracy of census and sample results. It should also be noted that more refined enumeration methods can sometimes only be employed with smaller-scale, (i.e., sample), studies. Reasons for this include the need for highly trained enumerators who are available only in limited numbers and the use of burdensome questionnaires that can be employed only with a small sample.