

NONSAMPLING ERRORS - We know you're out there ... And we're gonna get ya'!

by Toni Tremblay

Sampling errors receive a great deal of attention - they are printed in the summaries, they are fairly easy to understand, and their impact is discussed immediately. In that sense, sampling errors are highly visible. All of the other problems that can affect survey indications are lumped together as "nonsampling errors." They are difficult to detect, more difficult to measure, and even more difficult to control. The danger which they present can be serious. This danger is confounded by the fact that most nonsampling errors lay hidden among all the survey activities.

It is not unusual for a survey's nonsampling errors to be more detrimental than its sampling errors. In fact, a U .S. Census Bureau study found some nonsampling errors that were 10 times the magnitude of sampling errors. Therefore, it is well worth the effort to understand under what conditions they can occur and to strive to lessen their impact on the survey indications.

Nonsampling errors are the remaining errors after accounting for sampling errors. They include all the biases that can affect surveys. Even complete censuses are plagued by nonsampling errors. After all, even a census might have poorly worded questions, improperly trained personnel, or badly defined concepts.

Each and every stage of a survey process or census is a potential contributor to nonsampling errors. Even harder to believe is that we are among the culprits - survey designers, manual writers, trainers, enumerators, respondents, coders, keyers, printers, analysts, managers, etc. No single person or group is to blame, but we must take responsibility as a whole agency for the nonsampling errors.

A few illustrations of nonsampling errors are:

- (1) failure to obtain data on sampled units due to refusals, not-at-homes, unreturned or lost questionnaires,
- (2) long or repeated interviews which result in inaccurate responses,
- (3) the wording of the question causes the farmer to misunderstand the concept,
- (4) moisture meter is "just a hair off," and
- (5) incorrect decimal placement during keyentry.

How can we measure the nonsampling errors? Measurement of nonsampling errors usually includes subsampling the data and remeasuring this subset. However, new measurement techniques must be applied so as to avoid a repetition of the original errors. This situation is where special research studies come into the picture. We understand that they are sometimes difficult and always irritating to do; however, they are necessary if we are to learn how to best

deal with the subtle and troublesome problems caused by nonsampling errors.

The control and prevention of nonsampling errors are as varied as their sources. Actions taken may include clarification of purpose and definitions of the survey, attention to confidentiality concerns, key verification, improved recall techniques, consistency in training, callbacks, and use of tested and verified software and instruments.

Since their control and measurement must be an integral part of the total survey design, NASS has analyzed a great many nonsampling errors at all stages of the survey process. A few of them are:

- (1) The Influence of Using Previous Survey Data in the 1986 April ISP Grain Stocks Survey (Pafford, 1988)
- (2) Problems with Telephone Surveys (Warde, 1986)
- (3) The Effect of Enumeration on Soybean OY, 1986 (Battaglia, 1987)
- (4) Nonsampling Errors from Lab Procedures of the Wheat OY Survey (Bond, 1984).

Above all, awareness and discussion of nonsampling errors throughout all phases of the survey is critical. Constant feedback from those of you at the "front lines" is essential when trying to keep these nonsampling errors visible.