DISCUSSION

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These two papers are quite different in character, but both make useful contributions to sample survey methodology. The Krewski-Rao paper is concerned with the asymptotic behavior of the linearization, jackknife and balanced repeated replication methods of estimating the variances of complex stratified sample estimators as the number of strata approaches infinity. Asymptotic normality of the estimators and consistency of the variance estimators is established. In the past, survey statisticians have had no choice but to assume that these results hold, but it is comforting to have a theoretical basis for such an assumption.

The Shapiro-Bateman paper deals with the problem of variance estimation when only one primary sampling unit is selected from each stratum. It suggests that the use of a without replacement variance estimate, derived from the Durbin model for selecting two PSU's without replacement from a stratum, provides a better approximation to the true variance than does the ordinary collapsed stratum variance estimate. Some empirical and theoretical evidence is presented to demonstrate that this approach usually provides a variance estimate with smaller bias and variance. This study should be supplemented with further empirical studies, and should possibly include consideration of other models for selecting two PSU's without replacement.