

## DISCUSSION

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To me, when I was young, the model-based approach to estimation problems in sample surveys was the standard, natural one--that was what I learned at Cambridge. When I got to Rothamsted I used it in field and laboratory research in agriculture, in problems in which there were at most two or three measured response variables and in which it was relatively easy to collect extra data to check that the proposed model seemed to be correct. However, when we began to consider surveys of farm practices that might have over 50 questions, I saw the point of Yates' reliance on randomization and on results calculated over the sample space produced by his randomization method. Construction of over 50 models, some on variables with which I was not at all familiar, did not seem appealing.

When the model is well-behaved, the simplicity of some of its exact small-sample consequences is attractive, and I use them when I feel confident of the model. I have at times wondered, however, if experts in operations with models might not contribute more in the area of observational

studies. In this area, regression and ratio adjustments to remove initial biases have been found to be unreliable and vulnerable to attack. Short of abandoning observational studies, about the only positive method of attack on such problems is to try to develop more realistic (and presumably more complex) models and work out their consequences when used in attempts to reduce bias.

I agree with Dr. Godambe that lecture courses on sample surveys fail to attract. This has saddened me. I have been teaching sample surveys ever since I started teaching, and have always had the impression that in a Ph.D. program the sample surveys course was not popular, and somehow stuck out like a sore thumb. At times I have tried in lectures to relate sample survey randomization theory to the techniques taught in the mainstream courses. But if I did too much of this, I felt that I had stopped teaching sample surveys, and was just teaching another course in math. stat. I agree that books like Dr. Sarndal's will help in bridging this gap.