Some Issues in the Design and Analysis of Longitudinal Surveys

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There are several varieties of longitudinal studies in survey research, including panel surveys that follow a probability sample of the population over time, rotating panel surveys that follow a succession of samples of the population for limited duration with overlapping time periods, and cohort studies that follow a sample of a specific population group over time. This paper reviews a selection of issues arising in the design and analysis of such studies, supported by illustrations from existing surveys. Panel and rotating panel studies are widely analyzed both longitudinally and cross-sectionally, often as repeated cross-sections. For cross-sectional analysis, the longitudinal sample needs to be augmented by samples of new entrants to the population. It may also become necessary to augment the sample for panel attrition. Many sets of weights may be needed for the various types of analyses. Measurement errors and imputed values can be particularly harmful for estimates of gross change. Panel conditioning may seriously affect the results of analyses making comparisons over time, as can dependent interviewing. Changing modes of data collection across waves of a panel can also affect comparability, as can item nonresponse and imputation for it. Memory errors affect the choice of interval between waves. A commonly encountered design issue is whether to oversample certain domains; here it is important to distinguish between domains defined in terms of static and those defined in terms of transient characteristics. The geographical spread of the sample of PSUs needs to take account of population mobility. Updating the sample of PSUs presents data collection challenges for rotating panel designs.

Key words: cohort design; rotating panel design; panel attrition; panel conditioning