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Dropout in Crossover and Longitudinal Studies – Is Complete Case so Bad?

We consider the problem of missing observations in crossover trials.
Compared with longitudinal studies, crossovers bring two interesting twists. One is that crossover trials are used for palliative treatment of chronic conditions, rather than cure, which means patients can be treated over sustained periods. Thus they can experience a treatment but drop out before its effect is recorded. Second, each patient in the standard AB/BA design receives both treatments and is able to make their own comparison. Together these issues suggest that the possibility of missing not at random (MNAR) dropout related to missing response should not be dismissed easily. Yet most previous work in this area has been based on the presumption of missing at random (MAR) or missing completely at random (MCAR) dropout.

We investigate the consequences of mistakenly assuming a MAR dropout model for responses which are MNAR, within the context of inverse probability weighted estimating equations. We propose a methodology for dealing with MNAR dropout and we illustrate using data on a trial comparing two analgesics. We compare complete case estimators with dropout-adjusted estimators. We discuss targets for inference and argue that complete case analysis may be less problematic for crossover trials than elsewhere.