**Data S3.** Combined Inference after Multiple Imputation.

For both imputation approaches, results were pooled from the 50 imputed datasets as follows. In this study, is the regression coefficient of a linear regression model (or linear mixed model). Suppose we have imputed complete datasets (in this case, ). Let and denote the point estimate and variance from the th dataset (). Then the multiple imputation point estimate of is the average of the complete-data estimates:

The SE of the multiple imputed point estimate consists of two components: within-imputation variance and between-imputation variance. The within-imputation component is specified as:

The between-imputation component is specified as:

The total variance of the pooled estimate of is then given by:

Inference (hypothesis testing and confidence interval estimation) is based on , where the degrees of freedom .1

REFERENCE

1. Little RJ and Rubin DB. *Statistical Analysis with Missing Data (2nd edition).* John Wiley & Sons; 2002.