# Supplemental material to "Multiple imputation for longitudinal data in the presence of heteroscedasticity between treatment groups"

## 1 Results of simulation studies

### 1.1 Continuous outcome

Table S1.1 Table S1.2, Table S1.3, Table S1.4, Table S1.5, Table S1.6 and Table S1.7 show results of the simulation studies for the continuous outcome variables with seven scenarios of sample size (Treatment : Control) = 25:25, 50:50, 200:200, 20:40, 50:100, 40:20 and 100:50, respectively.

### 1.2 Binary outcome

Table S2.1 Table S2.2, Table S2.3 and Table S2.4 show results of the simulation studies for the binary outcome variables with four scenarios of sample size (Treatment : Control) = 100:100, 200:200, 100:200 and 200:100, respectively.

## 2 Missing data pattern in applications

### 2.1 Treatment of Lead-Exposed Children (TLC) trial data

Table S3.1 shows the missing data pattern of change from baseline in blood lead level (μg/dL) in TLC trial data.

### 2.2 Schizophrenia data

Table S4.1 shows the missing data pattern of severity score responder/non-responder in schizophrenia data.

Table S1.1. Simulation study results: continuous variable, sample size (Treatment : Control) = (25 : 25).

| Sample size (Treatment : Control) | Covariance structure | Correlation coefficient | SD ratio* | Dropout rate (Treatment : Control) | Measure | Imputation method + Analysis method | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Simultaneous + Equal variance | Simultaneous + Unequal variance | Separate + Equal variance | Separate + Unequal variance |
| 25 : 25 | Treatment: CS | Treatment: 0.75 | 1 | 20% : 20% | Bias | -0.001 | -0.001 | 0.002 | 0.003 |
| | Control: CS | Control: 0.75 | | | Empirical SE | 0.845 | 0.845 | 0.892 | 0.893 |
| | | | | | Model SE | 0.858 | 0.858 | 0.934 | 0.933 |
| | | | | | Root MSE | 0.845 | 0.845 | 0.892 | 0.893 |
| | | | | | Coverage Prob. | 0.948 | 0.949 | 0.959 | 0.959 |
| | | | | 40% : 10% | Bias | -0.011 | -0.012 | -0.010 | -0.009 |
| | | | | | Empirical SE | 0.879 | 0.878 | 1.013 | 1.013 |
| | | | | | Model SE | 0.907 | 0.907 | 1.113 | 1.111 |
| | | | | | Root MSE | 0.879 | 0.878 | 1.013 | 1.013 |
| | | | | | Coverage Prob. | 0.953 | 0.953 | 0.966 | 0.965 |
| | | | 2 | 20% : 20% | Bias | 0.005 | 0.005 | 0.003 | 0.003 |
| | | | | | Empirical SE | 1.362 | 1.362 | 1.437 | 1.435 |
| | | | | | Model SE | 1.362 | 1.362 | 1.481 | 1.480 |
| | | | | | Root MSE | 1.362 | 1.362 | 1.437 | 1.435 |
| | | | | | Coverage Prob. | 0.945 | 0.945 | 0.954 | 0.956 |
| | | | | 40% : 10% | Bias | 0.007 | 0.004 | -0.008 | -0.008 |
| | | | | | Empirical SE | 1.531 | 1.532 | 1.823 | 1.824 |
| | | | | | Model SE | 1.449 | 1.449 | 1.994 | 1.995 |
| | | | | | Root MSE | 1.531 | 1.532 | 1.823 | 1.824 |
| | | | | | Coverage Prob. | 0.932 | 0.930 | 0.962 | 0.959 |
| | | | 3 | 20% : 20% | Bias | 0.010 | 0.010 | 0.007 | 0.009 |
| | | | | | Empirical SE | 1.973 | 1.971 | 2.053 | 2.054 |
| | | | | | Model SE | 1.932 | 1.932 | 2.090 | 2.090 |
| | | | | | Root MSE | 1.972 | 1.971 | 2.053 | 2.054 |
| | | | | | Coverage Prob. | 0.938 | 0.939 | 0.950 | 0.952 |
| | | | | 40% : 10% | Bias | -0.022 | -0.022 | -0.035 | -0.033 |
| | | | | | Empirical SE | 2.309 | 2.310 | 2.661 | 2.662 |
| | | | | | Model SE | 2.075 | 2.074 | 2.912 | 2.912 |
| | | | | | Root MSE | 2.309 | 2.310 | 2.661 | 2.663 |
| | | | | | Coverage Prob. | 0.918 | 0.918 | 0.959 | 0.958 |

| Sample size (Treatment : Control) | Covariance structure | Correlation coefficient | SD ratio* | Dropout rate (Treatment : Control) | Measure | Imputation method + Analysis method | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Simultaneous + Equal variance | Simultaneous + Unequal variance | Separate + Equal variance | Separate + Unequal variance |
| 25 : 25 | Treatment: CSH | Treatment: 0.75 | 2 | 20% : 20% | Bias | 1.111 | 1.111 | -0.012 | -0.010 |
| | Control: IND | Control: 0.00 | | | Empirical SE | 1.331 | 1.330 | 1.454 | 1.452 |
| | | | | | Model SE | 1.368 | 1.367 | 1.523 | 1.523 |
| | | | | | Root MSE | 1.733 | 1.733 | 1.454 | 1.452 |
| | | | | | Coverage Prob. | 0.872 | 0.872 | 0.957 | 0.957 |
| | | | | 40% : 10% | Bias | 1.757 | 1.758 | -0.024 | -0.026 |
| | | | | | Empirical SE | 1.389 | 1.389 | 1.823 | 1.825 |
| | | | | | Model SE | 1.411 | 1.411 | 2.007 | 1.991 |
| | | | | | Root MSE | 2.240 | 2.240 | 1.823 | 1.825 |
| | | | | | Coverage Prob. | 0.742 | 0.743 | 0.958 | 0.958 |
| | | | 3 | 20% : 20% | Bias | 1.149 | 1.150 | -0.016 | -0.016 |
| | | | | | Empirical SE | 1.898 | 1.897 | 2.052 | 2.055 |
| | | | | | Model SE | 1.932 | 1.932 | 2.127 | 2.126 |
| | | | | | Root MSE | 2.218 | 2.218 | 2.052 | 2.055 |
| | | | | | Coverage Prob. | 0.899 | 0.898 | 0.956 | 0.956 |
| | | | | 40% : 10% | Bias | 1.868 | 1.871 | 0.045 | 0.047 |
| | | | | | Empirical SE | 2.052 | 2.052 | 2.641 | 2.643 |
| | | | | | Model SE | 1.991 | 1.991 | 2.881 | 2.876 |
| | | | | | Root MSE | 2.775 | 2.777 | 2.642 | 2.644 |
| | | | | | Coverage Prob. | 0.801 | 0.801 | 0.958 | 0.956 |

SD: Standard deviation, SE: Standard error, MSE: Mean square error, Prob.: Probability

CS: Compound symmetry, IND: Independent, CSH: Heterogeneous compound symmetry

*SD ratio = (SD in treatment group / SD in control group)

Table S1.2. Simulation study results: continuous variable, sample size (Treatment : Control) = (50 : 50).

| Sample size (Treatment : Control) | Covariance structure | Correlation coefficient | SD ratio* | Dropout rate (Treatment : Control) | Measure | Imputation method + Analysis method | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Simultaneous + Equal variance | Simultaneous + Unequal variance | Separate + Equal variance | Separate + Unequal variance |
| 50 : 50 | Treatment: CS | Treatment: 0.75 | 1 | 20% : 20% | Bias | -0.007 | -0.008 | -0.004 | -0.004 |
| | Control: CS | Control: 0.75 | | | Empirical SE | 0.596 | 0.596 | 0.625 | 0.626 |
| | | | | | Model SE | 0.600 | 0.599 | 0.635 | 0.634 |
| | | | | | Root MSE | 0.596 | 0.596 | 0.625 | 0.626 |
| | | | | | Coverage Prob. | 0.950 | 0.951 | 0.952 | 0.952 |
| | | | | 40% : 10% | Bias | -0.001 | -0.002 | -0.002 | -0.003 |
| | | | | | Empirical SE | 0.634 | 0.633 | 0.705 | 0.705 |
| | | | | | Model SE | 0.629 | 0.630 | 0.719 | 0.719 |
| | | | | | Root MSE | 0.634 | 0.633 | 0.705 | 0.705 |
| | | | | | Coverage Prob. | 0.947 | 0.947 | 0.953 | 0.953 |
| | | | 2 | 20% : 20% | Bias | -0.002 | -0.001 | -0.003 | -0.003 |
| | | | | | Empirical SE | 0.940 | 0.940 | 0.979 | 0.979 |
| | | | | | Model SE | 0.951 | 0.950 | 1.005 | 1.005 |
| | | | | | Root MSE | 0.940 | 0.940 | 0.979 | 0.979 |
| | | | | | Coverage Prob. | 0.950 | 0.950 | 0.956 | 0.955 |
| | | | | 40% : 10% | Bias | -0.005 | -0.006 | -0.007 | -0.007 |
| | | | | | Empirical SE | 1.076 | 1.076 | 1.220 | 1.221 |
| | | | | | Model SE | 1.001 | 1.001 | 1.260 | 1.261 |
| | | | | | Root MSE | 1.076 | 1.076 | 1.220 | 1.221 |
| | | | | | Coverage Prob. | 0.930 | 0.931 | 0.956 | 0.955 |
| | | | 3 | 20% : 20% | Bias | 0.001 | 0.002 | 0.006 | 0.006 |
| | | | | | Empirical SE | 1.352 | 1.352 | 1.394 | 1.393 |
| | | | | | Model SE | 1.350 | 1.350 | 1.420 | 1.420 |
| | | | | | Root MSE | 1.352 | 1.352 | 1.393 | 1.393 |
| | | | | | Coverage Prob. | 0.947 | 0.947 | 0.952 | 0.952 |
| | | | | 40% : 10% | Bias | -0.005 | -0.005 | -0.004 | -0.004 |
| | | | | | Empirical SE | 1.596 | 1.596 | 1.767 | 1.767 |
| | | | | | Model SE | 1.432 | 1.433 | 1.831 | 1.832 |
| | | | | | Root MSE | 1.596 | 1.596 | 1.767 | 1.766 |
| | | | | | Coverage Prob. | 0.917 | 0.917 | 0.954 | 0.953 |

| Sample size (Treatment : Control) | Covariance structure | Correlation coefficient | SD ratio* | Dropout rate (Treatment : Control) | Measure | Imputation method + Analysis method | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Simultaneous + Equal variance | Simultaneous + Unequal variance | Separate + Equal variance | Separate + Unequal variance |
| 50 : 50 | Treatment: CSH | Treatment: 0.75 | 2 | 20% : 20% | Bias | 1.108 | 1.108 | -0.007 | -0.007 |
| | Control: IND | Control: 0.00 | | | Empirical SE | 0.933 | 0.933 | 1.005 | 1.006 |
| | | | | | Model SE | 0.950 | 0.950 | 1.027 | 1.027 |
| | | | | | Root MSE | 1.448 | 1.448 | 1.005 | 1.006 |
| | | | | | Coverage Prob. | 0.792 | 0.791 | 0.953 | 0.954 |
| | | | | 40% : 10% | Bias | 1.739 | 1.740 | -0.006 | -0.005 |
| | | | | | Empirical SE | 0.962 | 0.962 | 1.218 | 1.217 |
| | | | | | Model SE | 0.964 | 0.964 | 1.262 | 1.262 |
| | | | | | Root MSE | 1.987 | 1.988 | 1.218 | 1.217 |
| | | | | | Coverage Prob. | 0.553 | 0.553 | 0.956 | 0.956 |
| | | | 3 | 20% : 20% | Bias | 1.134 | 1.134 | -0.007 | -0.006 |
| | | | | | Empirical SE | 1.320 | 1.320 | 1.405 | 1.403 |
| | | | | | Model SE | 1.344 | 1.344 | 1.437 | 1.437 |
| | | | | | Root MSE | 1.740 | 1.740 | 1.405 | 1.403 |
| | | | | | Coverage Prob. | 0.861 | 0.862 | 0.952 | 0.951 |
| | | | | 40% : 10% | Bias | 1.799 | 1.798 | 0.033 | 0.033 |
| | | | | | Empirical SE | 1.421 | 1.421 | 1.752 | 1.758 |
| | | | | | Model SE | 1.365 | 1.365 | 1.822 | 1.824 |
| | | | | | Root MSE | 2.292 | 2.291 | 1.752 | 1.759 |
| | | | | | Coverage Prob. | 0.710 | 0.710 | 0.955 | 0.953 |

SD: Standard deviation, SE: Standard error, MSE: Mean square error, Prob.: Probability
CS: Compound symmetry, IND: Independent, CSH: Heterogeneous compound symmetry
*SD ratio = (SD in treatment group / SD in control group)

Table S1.3. Simulation study results: continuous variable, sample size (Treatment : Control) = (200 : 200).

| Sample size (Treatment : Control) | Covariance structure | Correlation coefficient | SD ratio* | Dropout rate (Treatment : Control) | Measure | Imputation method + Analysis method | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Simultaneous + Equal variance | Simultaneous + Unequal variance | Separate + Equal variance | Separate + Unequal variance |
| 200 : 200 | Treatment: CS | Treatment: 0.75 | 1 | 20% : 20% | Bias | 0.002 | 0.002 | 0.002 | 0.002 |
| | Control: CS | Control: 0.75 | | | Empirical SE | 0.299 | 0.299 | 0.310 | 0.310 |
| | | | | | Model SE | 0.298 | 0.298 | 0.311 | 0.311 |
| | | | | | Root MSE | 0.299 | 0.299 | 0.310 | 0.310 |
| | | | | | Coverage Prob. | 0.947 | 0.950 | 0.951 | 0.951 |
| | | | | 40% : 10% | Bias | -0.005 | -0.005 | -0.008 | -0.007 |
| | | | | | Empirical SE | 0.310 | 0.311 | 0.341 | 0.341 |
| | | | | | Model SE | 0.312 | 0.312 | 0.344 | 0.344 |
| | | | | | Root MSE | 0.310 | 0.311 | 0.341 | 0.341 |
| | | | | | Coverage Prob. | 0.950 | 0.951 | 0.952 | 0.951 |
| | | | 2 | 20% : 20% | Bias | 0.005 | 0.005 | 0.005 | 0.005 |
| | | | | | Empirical SE | 0.471 | 0.471 | 0.487 | 0.487 |
| | | | | | Model SE | 0.473 | 0.473 | 0.493 | 0.493 |
| | | | | | Root MSE | 0.471 | 0.471 | 0.487 | 0.487 |
| | | | | | Coverage Prob. | 0.953 | 0.952 | 0.957 | 0.955 |
| | | | | 40% : 10% | Bias | -0.002 | -0.002 | -0.006 | -0.006 |
| | | | | | Empirical SE | 0.532 | 0.532 | 0.594 | 0.594 |
| | | | | | Model SE | 0.495 | 0.495 | 0.595 | 0.595 |
| | | | | | Root MSE | 0.532 | 0.532 | 0.594 | 0.594 |
| | | | | | Coverage Prob. | 0.928 | 0.929 | 0.951 | 0.950 |
| | | | 3 | 20% : 20% | Bias | 0.007 | 0.007 | 0.008 | 0.008 |
| | | | | | Empirical SE | 0.679 | 0.680 | 0.700 | 0.700 |
| | | | | | Model SE | 0.672 | 0.672 | 0.697 | 0.697 |
| | | | | | Root MSE | 0.679 | 0.680 | 0.700 | 0.700 |
| | | | | | Coverage Prob. | 0.945 | 0.945 | 0.947 | 0.947 |
| | | | | 40% : 10% | Bias | 0.001 | 0.001 | 0.001 | 0.002 |
| | | | | | Empirical SE | 0.791 | 0.792 | 0.861 | 0.860 |
| | | | | | Model SE | 0.705 | 0.705 | 0.862 | 0.861 |
| | | | | | Root MSE | 0.791 | 0.792 | 0.861 | 0.860 |
| | | | | | Coverage Prob. | 0.918 | 0.919 | 0.950 | 0.950 |

| Sample size (Treatment : Control) | Covariance structure | Correlation coefficient | SD ratio* | Dropout rate (Treatment : Control) | Measure | Imputation method + Analysis method | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Simultaneous + Equal variance | Simultaneous + Unequal variance | Separate + Equal variance | Separate + Unequal variance |
| 200 : 200 | Treatment: CSH | Treatment: 0.75 | 2 | 20% : 20% | Bias | 1.106 | 1.106 | 0.001 | 0.001 |
| | Control: IND | Control: 0.00 | | | Empirical SE | 0.475 | 0.475 | 0.509 | 0.509 |
| | | | | | Model SE | 0.469 | 0.470 | 0.501 | 0.500 |
| | | | | | Root MSE | 1.204 | 1.204 | 0.509 | 0.509 |
| | | | | | Coverage Prob. | 0.350 | 0.351 | 0.947 | 0.947 |
| | | | | 40% : 10% | Bias | 1.716 | 1.716 | -0.009 | -0.009 |
| | | | | | Empirical SE | 0.471 | 0.472 | 0.584 | 0.584 |
| | | | | | Model SE | 0.472 | 0.472 | 0.595 | 0.595 |
| | | | | | Root MSE | 1.779 | 1.780 | 0.584 | 0.584 |
| | | | | | Coverage Prob. | 0.051 | 0.051 | 0.952 | 0.951 |
| | | | 3 | 20% : 20% | Bias | 1.123 | 1.123 | -0.004 | -0.004 |
| | | | | | Empirical SE | 0.658 | 0.659 | 0.699 | 0.699 |
| | | | | | Model SE | 0.665 | 0.666 | 0.701 | 0.701 |
| | | | | | Root MSE | 1.302 | 1.302 | 0.699 | 0.699 |
| | | | | | Coverage Prob. | 0.614 | 0.611 | 0.951 | 0.950 |
| | | | | 40% : 10% | Bias | 1.723 | 1.723 | 0.005 | 0.004 |
| | | | | | Empirical SE | 0.694 | 0.694 | 0.848 | 0.848 |
| | | | | | Model SE | 0.671 | 0.670 | 0.857 | 0.858 |
| | | | | | Root MSE | 1.857 | 1.857 | 0.848 | 0.848 |
| | | | | | Coverage Prob. | 0.280 | 0.282 | 0.952 | 0.952 |

SD: Standard deviation, SE: Standard error, MSE: Mean square error, Prob.: Probability
CS: Compound symmetry, IND: Independent, CSH: Heterogeneous compound symmetry
*SD ratio = (SD in treatment group / SD in control group)

Table S1.4. Simulation study results: continuous variable, sample size (Treatment : Control) = (20 : 40).

| Sample size (Treatment : Control) | Covariance structure | Correlation coefficient | SD ratio* | Dropout rate (Treatment : Control) | Measure | Imputation method + Analysis method | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Simultaneous + Equal variance | Simultaneous + Unequal variance | Separate + Equal variance | Separate + Unequal variance |
| 20 : 40 | Treatment: CS | Treatment: 0.75 | 1 | 20% : 20% | Bias | 0.011 | 0.011 | 0.015 | 0.015 |
| | Control: CS | Control: 0.75 | | | Empirical SE | 0.821 | 0.822 | 0.867 | 0.867 |
| | | | | | Model SE | 0.828 | 0.827 | 0.906 | 0.910 |
| | | | | | Root MSE | 0.821 | 0.822 | 0.867 | 0.867 |
| | | | | | Coverage Prob. | 0.951 | 0.950 | 0.961 | 0.957 |
| | | | | 40% : 10% | Bias | -0.002 | -0.001 | 0.001 | 0.002 |
| | | | | | Empirical SE | 0.879 | 0.878 | 1.075 | 1.079 |
| | | | | | Model SE | 0.881 | 0.883 | 1.223 | 1.239 |
| | | | | | Root MSE | 0.879 | 0.878 | 1.075 | 1.079 |
| | | | | | Coverage Prob. | 0.949 | 0.949 | 0.966 | 0.964 |
| | | | 2 | 20% : 20% | Bias | -0.003 | -0.002 | -0.004 | -0.004 |
| | | | | | Empirical SE | 1.459 | 1.459 | 1.543 | 1.543 |
| | | | | | Model SE | 1.172 | 1.386 | 1.380 | 1.602 |
| | | | | | Root MSE | 1.459 | 1.459 | 1.543 | 1.543 |
| | | | | | Coverage Prob. | 0.880 | 0.929 | 0.917 | 0.950 |
| | | | | 40% : 10% | Bias | 0.003 | 0.004 | -0.013 | -0.005 |
| | | | | | Empirical SE | 1.620 | 1.620 | 2.109 | 2.076 |
| | | | | | Model SE | 1.248 | 1.441 | 2.227 | 2.363 |
| | | | | | Root MSE | 1.620 | 1.620 | 2.109 | 2.076 |
| | | | | | Coverage Prob. | 0.862 | 0.908 | 0.936 | 0.954 |
| | | | 3 | 20% : 20% | Bias | 0.015 | 0.015 | 0.010 | 0.011 |
| | | | | | Empirical SE | 2.134 | 2.135 | 2.248 | 2.247 |
| | | | | | Model SE | 1.593 | 2.003 | 1.911 | 2.326 |
| | | | | | Root MSE | 2.134 | 2.135 | 2.248 | 2.247 |
| | | | | | Coverage Prob. | 0.851 | 0.928 | 0.897 | 0.951 |
| | | | | 40% : 10% | Bias | -0.021 | -0.021 | -0.034 | -0.028 |
| | | | | | Empirical SE | 2.449 | 2.449 | 3.125 | 3.102 |
| | | | | | Model SE | 1.708 | 2.078 | 3.195 | 3.585 |
| | | | | | Root MSE | 2.449 | 2.449 | 3.125 | 3.102 |
| | | | | | Coverage Prob. | 0.823 | 0.896 | 0.930 | 0.958 |

| Sample size (Treatment : Control) | Covariance structure | Correlation coefficient | SD ratio* | Dropout rate (Treatment : Control) | Measure | Imputation method + Analysis method | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Simultaneous + Equal variance | Simultaneous + Unequal variance | Separate + Equal variance | Separate + Unequal variance |
| 20 : 40 | Treatment: CSH | Treatment: 0.75 | 2 | 20% : 20% | Bias | 1.199 | 1.200 | -0.052 | -0.052 |
| | Control: IND | Control: 0.00 | | | Empirical SE | 1.335 | 1.335 | 1.527 | 1.528 |
| | | | | | Model SE | 1.188 | 1.328 | 1.400 | 1.612 |
| | | | | | Root MSE | 1.794 | 1.795 | 1.528 | 1.529 |
| | | | | | Coverage Prob. | 0.789 | 0.840 | 0.924 | 0.957 |
| | | | | 40% : 10% | Bias | 2.135 | 2.136 | -0.040 | -0.039 |
| | | | | | Empirical SE | 1.419 | 1.418 | 2.076 | 2.075 |
| | | | | | Model SE | 1.252 | 1.351 | 2.190 | 2.373 |
| | | | | | Root MSE | 2.564 | 2.564 | 2.076 | 2.075 |
| | | | | | Coverage Prob. | 0.577 | 0.629 | 0.943 | 0.962 |
| | | | 3 | 20% : 20% | Bias | 1.355 | 1.356 | -0.011 | -0.013 |
| | | | | | Empirical SE | 1.952 | 1.952 | 2.204 | 2.206 |
| | | | | | Model SE | 1.589 | 1.913 | 1.919 | 2.328 |
| | | | | | Root MSE | 2.376 | 2.377 | 2.204 | 2.206 |
| | | | | | Coverage Prob. | 0.790 | 0.868 | 0.903 | 0.953 |
| | | | | 40% : 10% | Bias | 2.485 | 2.485 | 0.008 | 0.014 |
| | | | | | Empirical SE | 2.064 | 2.064 | 2.991 | 3.003 |
| | | | | | Model SE | 1.651 | 1.891 | 3.093 | 3.441 |
| | | | | | Root MSE | 3.230 | 3.230 | 2.991 | 3.002 |
| | | | | | Coverage Prob. | 0.622 | 0.698 | 0.937 | 0.960 |

SD: Standard deviation, SE: Standard error, MSE: Mean square error, Prob.: Probability

CS: Compound symmetry, IND: Independent, CSH: Heterogeneous compound symmetry

*SD ratio = (SD in treatment group / SD in control group)

Table S1.5. Simulation study results: continuous variable, sample size (Treatment : Control) = (50 : 100).

| Sample size (Treatment : Control) | Covariance structure | Correlation coefficient | SD ratio* | Dropout rate (Treatment : Control) | Measure | Imputation method + Analysis method | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Simultaneous + Equal variance | Simultaneous + Unequal variance | Separate + Equal variance | Separate + Unequal variance |
| 50 : 100 | Treatment: CS | Treatment: 0.75 | 1 | 20% : 20% | Bias | -0.002 | -0.003 | -0.004 | -0.005 |
| | Control: CS | Control: 0.75 | | | Empirical SE | 0.512 | 0.512 | 0.535 | 0.535 |
| | | | | | Model SE | 0.518 | 0.518 | 0.547 | 0.548 |
| | | | | | Root MSE | 0.512 | 0.512 | 0.535 | 0.535 |
| | | | | | Coverage Prob. | 0.954 | 0.952 | 0.955 | 0.955 |
| | | | | 40% : 10% | Bias | -0.001 | -0.002 | -0.001 | -0.002 |
| | | | | | Empirical SE | 0.549 | 0.549 | 0.635 | 0.634 |
| | | | | | Model SE | 0.550 | 0.550 | 0.651 | 0.655 |
| | | | | | Root MSE | 0.549 | 0.549 | 0.635 | 0.634 |
| | | | | | Coverage Prob. | 0.951 | 0.951 | 0.957 | 0.957 |
| | | | 2 | 20% : 20% | Bias | -0.015 | -0.016 | -0.015 | -0.016 |
| | | | | | Empirical SE | 0.901 | 0.901 | 0.940 | 0.941 |
| | | | | | Model SE | 0.736 | 0.873 | 0.817 | 0.956 |
| | | | | | Root MSE | 0.901 | 0.901 | 0.941 | 0.941 |
| | | | | | Coverage Prob. | 0.890 | 0.941 | 0.910 | 0.952 |
| | | | | 40% : 10% | Bias | 0.016 | 0.016 | 0.022 | 0.022 |
| | | | | | Empirical SE | 0.989 | 0.988 | 1.174 | 1.175 |
| | | | | | Model SE | 0.778 | 0.901 | 1.109 | 1.221 |
| | | | | | Root MSE | 0.989 | 0.988 | 1.174 | 1.175 |
| | | | | | Coverage Prob. | 0.877 | 0.925 | 0.929 | 0.953 |
| | | | 3 | 20% : 20% | Bias | -0.005 | -0.006 | -0.007 | -0.008 |
| | | | | | Empirical SE | 1.333 | 1.334 | 1.382 | 1.383 |
| | | | | | Model SE | 1.001 | 1.261 | 1.125 | 1.387 |
| | | | | | Root MSE | 1.333 | 1.334 | 1.382 | 1.383 |
| | | | | | Coverage Prob. | 0.859 | 0.935 | 0.890 | 0.949 |
| | | | | 40% : 10% | Bias | -0.021 | -0.020 | -0.024 | -0.023 |
| | | | | | Empirical SE | 1.534 | 1.533 | 1.760 | 1.761 |
| | | | | | Model SE | 1.063 | 1.298 | 1.598 | 1.805 |
| | | | | | Root MSE | 1.534 | 1.533 | 1.760 | 1.762 |
| | | | | | Coverage Prob. | 0.822 | 0.900 | 0.919 | 0.952 |

| Sample size (Treatment : Control) | Covariance structure | Correlation coefficient | SD ratio* | Dropout rate (Treatment : Control) | Measure | Imputation method + Analysis method | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Simultaneous + Equal variance | Simultaneous + Unequal variance | Separate + Equal variance | Separate + Unequal variance |
| 50 :100 | Treatment: CSH | Treatment: 0.75 | 2 | 20% : 20% | Bias | 1.239 | 1.238 | 0.018 | 0.018 |
| | Control: IND | Control: 0.00 | | | Empirical SE | 0.855 | 0.855 | 0.956 | 0.956 |
| | | | | | Model SE | 0.737 | 0.828 | 0.822 | 0.959 |
| | | | | | Root MSE | 1.505 | 1.505 | 0.956 | 0.956 |
| | | | | | Coverage Prob. | 0.591 | 0.673 | 0.908 | 0.949 |
| | | | | 40% : 10% | Bias | 2.107 | 2.108 | -0.013 | -0.012 |
| | | | | | Empirical SE | 0.884 | 0.884 | 1.175 | 1.175 |
| | | | | | Model SE | 0.769 | 0.832 | 1.109 | 1.223 |
| | | | | | Root MSE | 2.285 | 2.286 | 1.175 | 1.175 |
| | | | | | Coverage Prob. | 0.252 | 0.298 | 0.932 | 0.953 |
| | | | 3 | 20% : 20% | Bias | 1.331 | 1.331 | 0.008 | 0.008 |
| | | | | | Empirical SE | 1.243 | 1.243 | 1.387 | 1.386 |
| | | | | | Model SE | 0.993 | 1.202 | 1.129 | 1.389 |
| | | | | | Root MSE | 1.821 | 1.821 | 1.387 | 1.386 |
| | | | | | Coverage Prob. | 0.676 | 0.784 | 0.890 | 0.948 |
| | | | | 40% : 10% | Bias | 2.389 | 2.387 | -0.017 | -0.017 |
| | | | | | Empirical SE | 1.295 | 1.296 | 1.743 | 1.746 |
| | | | | | Model SE | 1.019 | 1.171 | 1.590 | 1.797 |
| | | | | | Root MSE | 2.717 | 2.716 | 1.743 | 1.746 |
| | | | | | Coverage Prob. | 0.380 | 0.467 | 0.922 | 0.956 |

SD: Standard deviation, SE: Standard error, MSE: Mean square error, Prob.: Probability

CS: Compound symmetry, IND: Independent, CSH: Heterogeneous compound symmetry

*SD ratio = (SD in treatment group / SD in control group)

Table S1.6. Simulation study results: continuous variable, sample size (Treatment : Control) = (40 : 20).

| Sample size (Treatment : Control) | Covariance structure | Correlation coefficient | SD ratio* | Dropout rate (Treatment : Control) | Measure | Imputation method + Analysis method: Simultaneous + Equal variance | Simultaneous + Unequal variance | Separate + Equal variance | Separate + Unequal variance |
|---|---|---|---|---|---|---|---|---|---|
| 40 : 20 | Treatment: CS | Treatment: 0.75 | 1 | 20% : 20% | Bias | 0.003 | 0.003 | 0.001 | 0.002 |
| | Control: CS | Control: 0.75 | | | Empirical SE | 0.822 | 0.822 | 0.868 | 0.868 |
| | | | | | Model SE | 0.828 | 0.827 | 0.904 | 0.908 |
| | | | | | Root MSE | 0.822 | 0.822 | 0.868 | 0.868 |
| | | | | | Coverage Prob. | 0.948 | 0.948 | 0.959 | 0.959 |
| | | | | 40% : 10% | Bias | 0.005 | 0.005 | 0.004 | 0.003 |
| | | | | | Empirical SE | 0.840 | 0.840 | 0.913 | 0.913 |
| | | | | | Model SE | 0.861 | 0.856 | 0.963 | 0.957 |
| | | | | | Root MSE | 0.840 | 0.840 | 0.913 | 0.913 |
| | | | | | Coverage Prob. | 0.952 | 0.951 | 0.957 | 0.958 |
| | | | 2 | 20% : 20% | Bias | 0.000 | 0.001 | 0.000 | -0.001 |
| | | | | | Empirical SE | 1.164 | 1.163 | 1.220 | 1.222 |
| | | | | | Model SE | 1.443 | 1.233 | 1.494 | 1.270 |
| | | | | | Root MSE | 1.164 | 1.163 | 1.220 | 1.222 |
| | | | | | Coverage Prob. | 0.984 | 0.961 | 0.982 | 0.957 |
| | | | | 40% : 10% | Bias | 0.015 | 0.015 | 0.006 | 0.007 |
| | | | | | Empirical SE | 1.336 | 1.335 | 1.474 | 1.476 |
| | | | | | Model SE | 1.511 | 1.308 | 1.741 | 1.531 |
| | | | | | Root MSE | 1.336 | 1.335 | 1.474 | 1.475 |
| | | | | | Coverage Prob. | 0.969 | 0.944 | 0.976 | 0.954 |
| | | | 3 | 20% : 20% | Bias | 0.010 | 0.011 | 0.015 | 0.015 |
| | | | | | Empirical SE | 1.613 | 1.612 | 1.667 | 1.668 |
| | | | | | Model SE | 2.100 | 1.710 | 2.134 | 1.705 |
| | | | | | Root MSE | 1.613 | 1.612 | 1.667 | 1.668 |
| | | | | | Coverage Prob. | 0.989 | 0.959 | 0.987 | 0.953 |
| | | | | 40% : 10% | Bias | 0.019 | 0.019 | 0.028 | 0.028 |
| | | | | | Empirical SE | 1.890 | 1.888 | 2.037 | 2.039 |
| | | | | | Model SE | 2.206 | 1.831 | 2.534 | 2.154 |
| | | | | | Root MSE | 1.890 | 1.888 | 2.037 | 2.040 |
| | | | | | Coverage Prob. | 0.974 | 0.940 | 0.981 | 0.955 |

| Sample size (Treatment : Control) | Covariance structure | Correlation coefficient | SD ratio* | Dropout rate (Treatment : Control) | Measure | Imputation method + Analysis method | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Simultaneous + Equal variance | Simultaneous + Unequal variance | Separate + Equal variance | Separate + Unequal variance |
| 40 : 20 | Treatment: CSH | Treatment: 0.75 | 2 | 20% : 20% | Bias | 1.038 | 1.037 | 0.018 | 0.018 |
| | Control: IND | Control: 0.00 | | | Empirical SE | 1.213 | 1.213 | 1.267 | 1.265 |
| | | | | | Model SE | 1.436 | 1.279 | 1.550 | 1.347 |
| | | | | | Root MSE | 1.597 | 1.596 | 1.267 | 1.265 |
| | | | | | Coverage Prob. | 0.924 | 0.885 | 0.982 | 0.958 |
| | | | | 40% : 10% | Bias | 1.350 | 1.351 | -0.009 | -0.009 |
| | | | | | Empirical SE | 1.247 | 1.248 | 1.471 | 1.472 |
| | | | | | Model SE | 1.452 | 1.314 | 1.756 | 1.555 |
| | | | | | Root MSE | 1.838 | 1.839 | 1.471 | 1.472 |
| | | | | | Coverage Prob. | 0.864 | 0.816 | 0.977 | 0.957 |
| | | | 3 | 20% : 20% | Bias | 0.994 | 0.994 | -0.027 | -0.028 |
| | | | | | Empirical SE | 1.632 | 1.633 | 1.688 | 1.688 |
| | | | | | Model SE | 2.091 | 1.747 | 2.177 | 1.767 |
| | | | | | Root MSE | 1.911 | 1.912 | 1.689 | 1.688 |
| | | | | | Coverage Prob. | 0.964 | 0.922 | 0.986 | 0.956 |
| | | | | 40% : 10% | Bias | 1.272 | 1.272 | 0.012 | 0.015 |
| | | | | | Empirical SE | 1.743 | 1.744 | 2.010 | 2.008 |
| | | | | | Model SE | 2.129 | 1.820 | 2.529 | 2.152 |
| | | | | | Root MSE | 2.158 | 2.158 | 2.010 | 2.008 |
| | | | | | Coverage Prob. | 0.924 | 0.877 | 0.981 | 0.958 |

SD: Standard deviation, SE: Standard error, MSE: Mean square error, Prob.: Probability

CS: Compound symmetry, IND: Independent, CSH: Heterogeneous compound symmetry

*SD ratio = (SD in treatment group / SD in control group)

Table S1.7. Simulation study results: continuous variable, sample size (Treatment : Control) = (100 : 50).

| Sample size (Treatment : Control) | Covariance structure | Correlation coefficient | SD ratio* | Dropout rate (Treatment : Control) | Measure | Imputation method + Analysis method | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Simultaneous + Equal variance | Simultaneous + Unequal variance | Separate + Equal variance | Separate + Unequal variance |
| 100 : 50 | Treatment: CS | Treatment: 0.75 | 1 | 20% : 20% | Bias | 0.004 | 0.004 | 0.002 | 0.002 |
| | Control: CS | Control: 0.75 | | | Empirical SE | 0.520 | 0.521 | 0.544 | 0.544 |
| | | | | | Model SE | 0.518 | 0.518 | 0.546 | 0.546 |
| | | | | | Root MSE | 0.520 | 0.521 | 0.544 | 0.544 |
| | | | | | Coverage Prob. | 0.948 | 0.947 | 0.952 | 0.950 |
| | | | | 40% : 10% | Bias | 0.005 | 0.005 | 0.006 | 0.006 |
| | | | | | Empirical SE | 0.529 | 0.529 | 0.568 | 0.568 |
| | | | | | Model SE | 0.534 | 0.533 | 0.577 | 0.576 |
| | | | | | Root MSE | 0.529 | 0.529 | 0.568 | 0.568 |
| | | | | | Coverage Prob. | 0.951 | 0.950 | 0.952 | 0.952 |
| | | | 2 | 20% : 20% | Bias | 0.003 | 0.003 | 0.000 | 0.000 |
| | | | | | Empirical SE | 0.739 | 0.738 | 0.766 | 0.765 |
| | | | | | Model SE | 0.901 | 0.768 | 0.917 | 0.773 |
| | | | | | Root MSE | 0.739 | 0.738 | 0.766 | 0.765 |
| | | | | | Coverage Prob. | 0.982 | 0.959 | 0.980 | 0.952 |
| | | | | 40% : 10% | Bias | 0.005 | 0.006 | 0.007 | 0.008 |
| | | | | | Empirical SE | 0.830 | 0.829 | 0.901 | 0.900 |
| | | | | | Model SE | 0.932 | 0.805 | 1.037 | 0.908 |
| | | | | | Root MSE | 0.830 | 0.829 | 0.901 | 0.900 |
| | | | | | Coverage Prob. | 0.972 | 0.942 | 0.974 | 0.951 |
| | | | 3 | 20% : 20% | Bias | 0.007 | 0.007 | 0.008 | 0.009 |
| | | | | | Empirical SE | 0.994 | 0.994 | 1.024 | 1.024 |
| | | | | | Model SE | 1.312 | 1.064 | 1.317 | 1.043 |
| | | | | | Root MSE | 0.994 | 0.994 | 1.024 | 1.024 |
| | | | | | Coverage Prob. | 0.990 | 0.963 | 0.989 | 0.952 |
| | | | | 40% : 10% | Bias | 0.004 | 0.003 | 0.005 | 0.006 |
| | | | | | Empirical SE | 1.168 | 1.167 | 1.241 | 1.241 |
| | | | | | Model SE | 1.361 | 1.125 | 1.515 | 1.277 |
| | | | | | Root MSE | 1.168 | 1.167 | 1.241 | 1.241 |
| | | | | | Coverage Prob. | 0.978 | 0.938 | 0.983 | 0.953 |

| Sample size (Treatment : Control) | Covariance structure | Correlation coefficient | SD ratio* | Dropout rate (Treatment : Control) | Measure | Imputation method + Analysis method | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Simultaneous + Equal variance | Simultaneous + Unequal variance | Separate + Equal variance | Separate + Unequal variance |
| 100 : 50 | Treatment: CSH | Treatment: 0.75 | 2 | 20% : 20% | Bias | 1.021 | 1.021 | 0.006 | 0.006 |
| | Control: IND | Control: 0.00 | | | Empirical SE | 0.756 | 0.756 | 0.780 | 0.780 |
| | | | | | Model SE | 0.894 | 0.793 | 0.937 | 0.800 |
| | | | | | Root MSE | 1.271 | 1.271 | 0.780 | 0.780 |
| | | | | | Coverage Prob. | 0.830 | 0.760 | 0.978 | 0.953 |
| | | | | 40% : 10% | Bias | 1.328 | 1.328 | -0.009 | -0.011 |
| | | | | | Empirical SE | 0.771 | 0.771 | 0.892 | 0.892 |
| | | | | | Model SE | 0.886 | 0.801 | 1.042 | 0.915 |
| | | | | | Root MSE | 1.535 | 1.535 | 0.892 | 0.893 |
| | | | | | Coverage Prob. | 0.684 | 0.607 | 0.978 | 0.957 |
| | | | 3 | 20% : 20% | Bias | 1.000 | 1.000 | -0.007 | -0.008 |
| | | | | | Empirical SE | 1.012 | 1.013 | 1.044 | 1.044 |
| | | | | | Model SE | 1.304 | 1.084 | 1.332 | 1.063 |
| | | | | | Root MSE | 1.422 | 1.424 | 1.044 | 1.044 |
| | | | | | Coverage Prob. | 0.932 | 0.864 | 0.985 | 0.952 |
| | | | | 40% : 10% | Bias | 1.222 | 1.223 | -0.005 | -0.004 |
| | | | | | Empirical SE | 1.108 | 1.107 | 1.256 | 1.257 |
| | | | | | Model SE | 1.310 | 1.114 | 1.514 | 1.277 |
| | | | | | Root MSE | 1.649 | 1.649 | 1.256 | 1.257 |
| | | | | | Coverage Prob. | 0.868 | 0.792 | 0.982 | 0.952 |

SD: Standard deviation, SE: Standard error, MSE: Mean square error, Prob.: Probability

CS: Compound symmetry, IND: Independent, CSH: Heterogeneous compound symmetry

*SD ratio = (SD in treatment group / SD in control group)

Table S2.1. Simulation study results: binary variable, sample size (Treatment : Control) = (100 : 100).

| **Sample size (Treatment : Control)** | **Correlation structure** | **Correlation coefficient** | **Dropout rate (Treatment : Control)** | **Measure** | **Simultaneous imputation** | **Separate imputation** |
|---|---|---|---|---|---|---|
| 100 : 100 | Treatment: AR(1) | Treatment: 0.6 | 20% : 20% | Bias | 0.002 | -0.004 |
| | Control: AR(1) | Control: 0.6 | | Empirical SE | 0.073 | 0.073 |
| | | | | Model SE | 0.073 | 0.073 |
| | | | | Root MSE | 0.073 | 0.073 |
| | | | | Coverage Prob. | 0.946 | 0.950 |
| | | | 15% : 40% | Bias | 0.001 | -0.007 |
| | | | | Empirical SE | 0.076 | 0.075 |
| | | | | Model SE | 0.075 | 0.076 |
| | | | | Root MSE | 0.076 | 0.075 |
| | | | | Coverage Prob. | 0.946 | 0.952 |
| | Treatment: AR(1) | Treatment: 0.6 | 20% : 20% | Bias | 0.025 | -0.003 |
| | Control: IND | Control: 0.0 | | Empirical SE | 0.073 | 0.073 |
| | | | | Model SE | 0.073 | 0.074 |
| | | | | Root MSE | 0.077 | 0.073 |
| | | | | Coverage Prob. | 0.934 | 0.952 |
| | | | 15% : 40% | Bias | 0.023 | -0.008 |
| | | | | Empirical SE | 0.078 | 0.078 |
| | | | | Model SE | 0.077 | 0.079 |
| | | | | Root MSE | 0.081 | 0.078 |
| | | | | Coverage Prob. | 0.928 | 0.952 |

SD: Standard deviation, SE: Standard error, MSE: Mean square error, Prob.: Probability

AR(1): First-order autoregressive, IND: Independent

Table S2.2. Simulation study results: binary variable, sample size (Treatment : Control) = (200 : 200).

| **Sample size (Treatment : Control)** | **Correlation structure** | **Correlation coefficient** | **Dropout rate (Treatment : Control)** | **Measure** | **Simultaneous imputation** | **Separate imputation** |
|---|---|---|---|---|---|---|
| 200 : 200 | Treatment: AR(1) | Treatment: 0.6 | 20% : 20% | Bias | 0.002 | -0.003 |
| | Control: AR(1) | Control: 0.6 | | Empirical SE | 0.051 | 0.051 |
| | | | | Model SE | 0.052 | 0.052 |
| | | | | Root MSE | 0.051 | 0.052 |
| | | | | Coverage Prob. | 0.948 | 0.950 |
| | | | 15% : 40% | Bias | 0.002 | -0.004 |
| | | | | Empirical SE | 0.054 | 0.053 |
| | | | | Model SE | 0.053 | 0.054 |
| | | | | Root MSE | 0.054 | 0.053 |
| | | | | Coverage Prob. | 0.947 | 0.950 |
| | Treatment: AR(1) | Treatment: 0.6 | 20% : 20% | Bias | 0.025 | -0.002 |
| | Control: IND | Control: 0.0 | | Empirical SE | 0.052 | 0.053 |
| | | | | Model SE | 0.052 | 0.053 |
| | | | | Root MSE | 0.058 | 0.053 |
| | | | | Coverage Prob. | 0.917 | 0.947 |
| | | | 15% : 40% | Bias | 0.025 | -0.004 |
| | | | | Empirical SE | 0.055 | 0.056 |
| | | | | Model SE | 0.054 | 0.056 |
| | | | | Root MSE | 0.061 | 0.056 |
| | | | | Coverage Prob. | 0.914 | 0.953 |

SD: Standard deviation, SE: Standard error, MSE: Mean square error, Prob.: Probability
AR(1): First-order autoregressive, IND: Independent

Table S2.3. Simulation study results: binary variable, sample size (Treatment : Control) = (100 : 200).

| **Sample size (Treatment : Control)** | **Correlation structure** | **Correlation coefficient** | **Dropout rate (Treatment : Control)** | **Measure** | **Simultaneous imputation** | **Separate imputation** |
|---|---|---|---|---|---|---|
| 100 : 200 | Treatment: AR(1) | Treatment: 0.6 | 20% : 20% | Bias | 0.003 | -0.003 |
| | Control: AR(1) | Control: 0.6 | | Empirical SE | 0.065 | 0.065 |
| | | | | Model SE | 0.064 | 0.064 |
| | | | | Root MSE | 0.065 | 0.065 |
| | | | | Coverage Prob. | 0.946 | 0.948 |
| | | | 15% : 40% | Bias | 0.003 | -0.003 |
| | | | | Empirical SE | 0.065 | 0.064 |
| | | | | Model SE | 0.065 | 0.065 |
| | | | | Root MSE | 0.065 | 0.065 |
| | | | | Coverage Prob. | 0.949 | 0.952 |
| | Treatment: AR(1) | Treatment: 0.6 | 20% : 20% | Bias | 0.026 | -0.002 |
| | Control: IND | Control: 0.0 | | Empirical SE | 0.065 | 0.065 |
| | | | | Model SE | 0.065 | 0.065 |
| | | | | Root MSE | 0.070 | 0.065 |
| | | | | Coverage Prob. | 0.922 | 0.948 |
| | | | 15% : 40% | Bias | 0.025 | -0.003 |
| | | | | Empirical SE | 0.067 | 0.067 |
| | | | | Model SE | 0.066 | 0.067 |
| | | | | Root MSE | 0.071 | 0.067 |
| | | | | Coverage Prob. | 0.928 | 0.947 |

SD: Standard deviation, SE: Standard error, MSE: Mean square error, Prob.: Probability

AR(1): First-order autoregressive, IND: Independent

Table S2.4. Simulation study results: binary variable, sample size (Treatment : Control) = (200 : 100).

| **Sample size (Treatment : Control)** | **Correlation structure** | **Correlation coefficient** | **Dropout rate (Treatment : Control)** | **Measure** | **Simultaneous imputation** | **Separate imputation** |
|---|---|---|---|---|---|---|
| 200 : 100 | Treatment: AR(1) | Treatment: 0.6 | 20% : 20% | Bias | 0.003 | -0.003 |
| | Control: AR(1) | Control: 0.6 | | Empirical SE | 0.062 | 0.062 |
| | | | | Model SE | 0.062 | 0.062 |
| | | | | Root MSE | 0.062 | 0.062 |
| | | | | Coverage Prob. | 0.947 | 0.950 |
| | | | 15% : 40% | Bias | 0.001 | -0.006 |
| | | | | Empirical SE | 0.066 | 0.065 |
| | | | | Model SE | 0.065 | 0.067 |
| | | | | Root MSE | 0.066 | 0.065 |
| | | | | Coverage Prob. | 0.944 | 0.953 |
| | Treatment: AR(1) | Treatment: 0.6 | 20% : 20% | Bias | 0.023 | -0.004 |
| | Control: IND | Control: 0.0 | | Empirical SE | 0.063 | 0.063 |
| | | | | Model SE | 0.062 | 0.064 |
| | | | | Root MSE | 0.067 | 0.063 |
| | | | | Coverage Prob. | 0.926 | 0.952 |
| | | | 15% : 40% | Bias | 0.024 | -0.007 |
| | | | | Empirical SE | 0.069 | 0.069 |
| | | | | Model SE | 0.066 | 0.070 |
| | | | | Root MSE | 0.073 | 0.070 |
| | | | | Coverage Prob. | 0.916 | 0.953 |

SD: Standard deviation, SE: Standard error, MSE: Mean square error, Prob.: Probability

AR(1): First-order autoregressive, IND: Independent

Table S3.1. Missing data pattern of change from baseline in blood lead level (μg/dL) in TLC trial data.

| Post-baseline measurement occasion | | | | |
|---|---|---|---|---|
| **Week 1** | **Week 4** | **Wee 6** | **Frequency** | **Percentage** |
| **Succimer (N=47)** | | | | |
| O | O | O | 18 | 38.30% |
| O | O | M | 12 | 25.53% |
| O | M | O | 5 | 10.64% |
| O | M | M | 6 | 12.77% |
| M | O | O | 2 | 4.26% |
| M | O | M | 3 | 6.38% |
| M | M | O | 1 | 2.13% |
| **Placebo (N=50)** | | | | |
| O | O | O | 42 | 84.00% |
| O | O | M | 2 | 4.00% |
| O | M | O | 3 | 6.00% |
| M | O | O | 2 | 4.00% |
| M | M | O | 1 | 2.00% |

O: Observed, M: Missing

Table S4.1. Missing data pattern of severity score responder/non-responder in schizophrenia data.

| Measurement occasion | | | | | |
|---|---|---|---|---|---|
| **Week 0** | **Week 1** | **Week 3** | **Wee 6** | **Frequency** | **Percentage** |
| **Anti-psychotic drug (N=329)** | | | | | |
| O | O | O | O | 248 | 75.38% |
| O | O | O | M | 34 | 10.33% |
| O | O | M | O | 10 | 3.04% |
| O | O | M | M | 27 | 8.21% |
| O | M | O | O | 3 | 0.91% |
| O | M | M | O | 2 | 0.61% |
| O | M | M | M | 3 | 0.91% |
| M | O | O | O | 2 | 0.61% |
| **Placebo (N=108)** | | | | | |
| O | O | O | O | 64 | 59.26% |
| O | O | O | M | 19 | 17.59% |
| O | O | M | O | 3 | 2.78% |
| O | O | M | M | 18 | 16.67% |
| O | M | O | O | 2 | 1.85% |
| O | M | O | M | 1 | 0.93% |
| M | O | O | O | 1 | 0.93% |

O: Observed, M: Missing