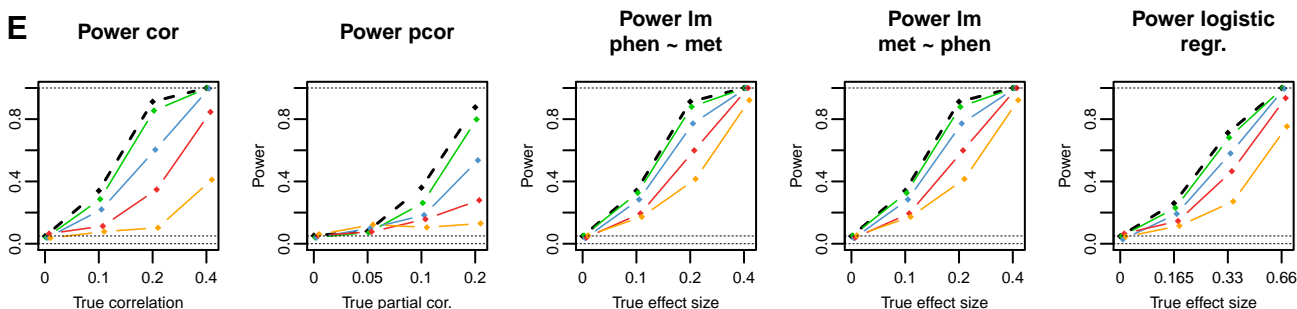
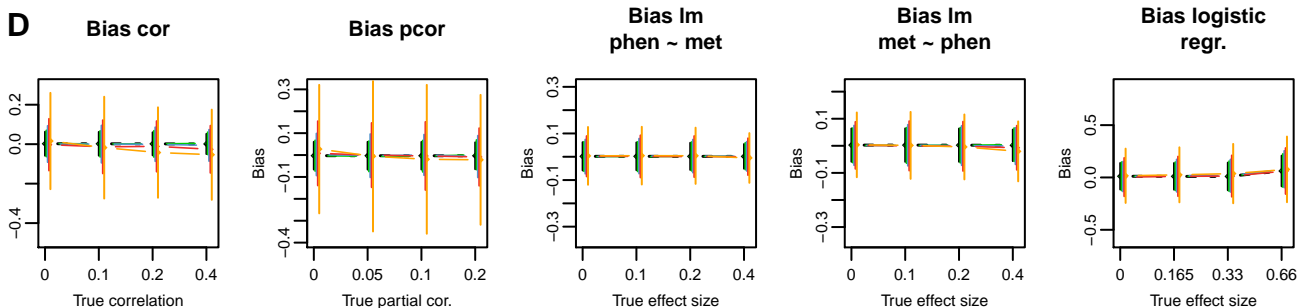
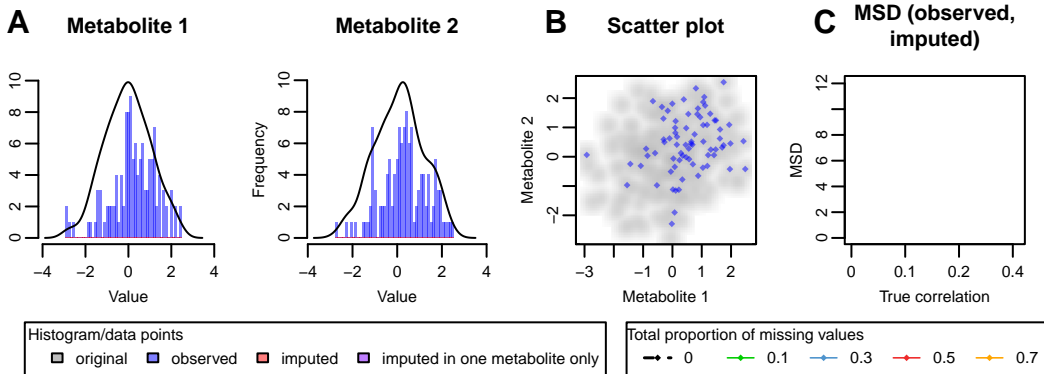


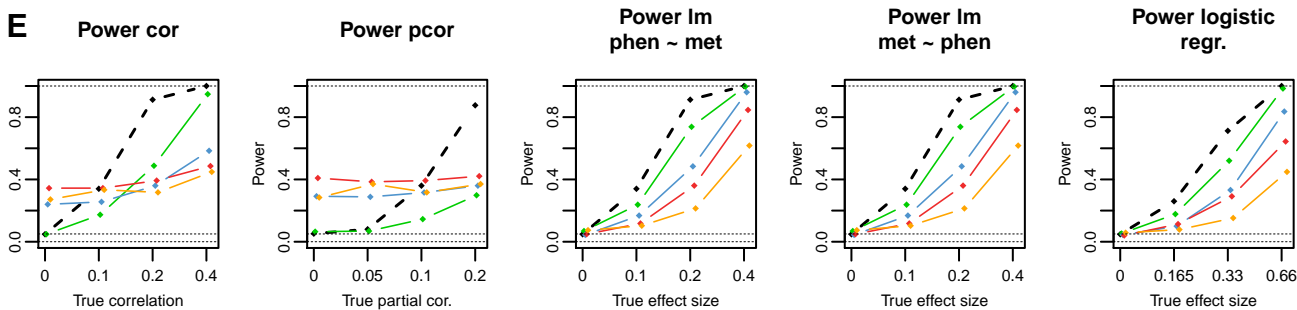
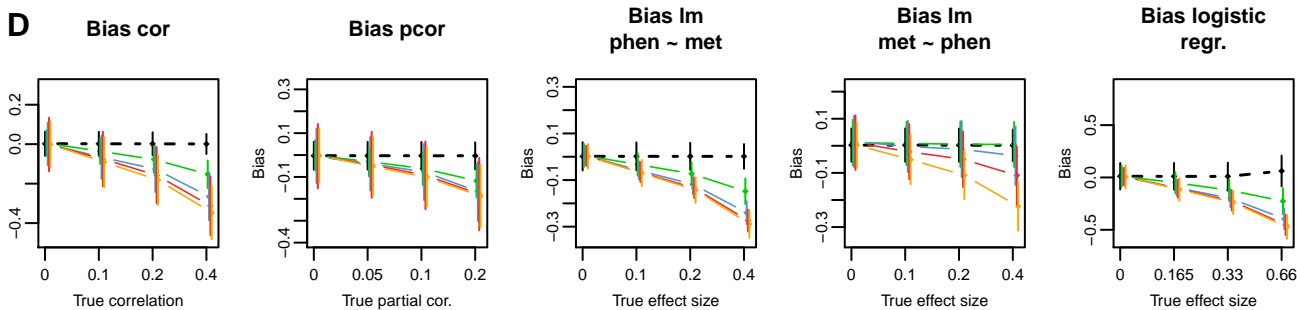
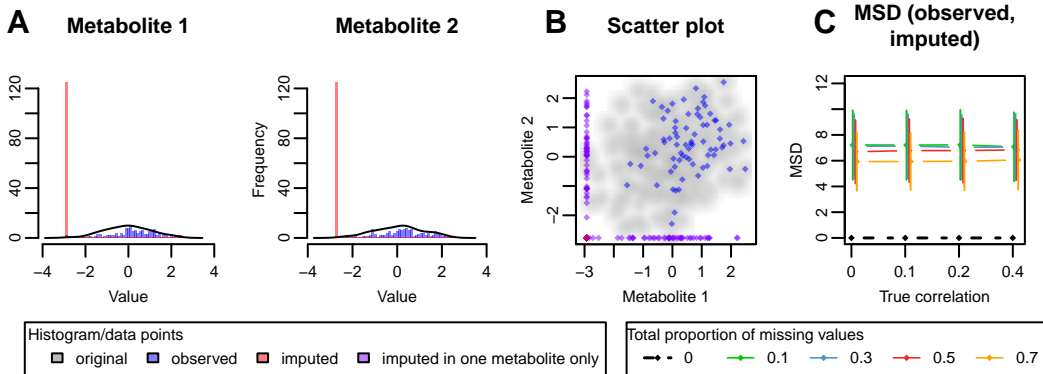
Characterization of missingness in untargeted MS-based metabolomics data sets and evaluation of missing data handling strategies

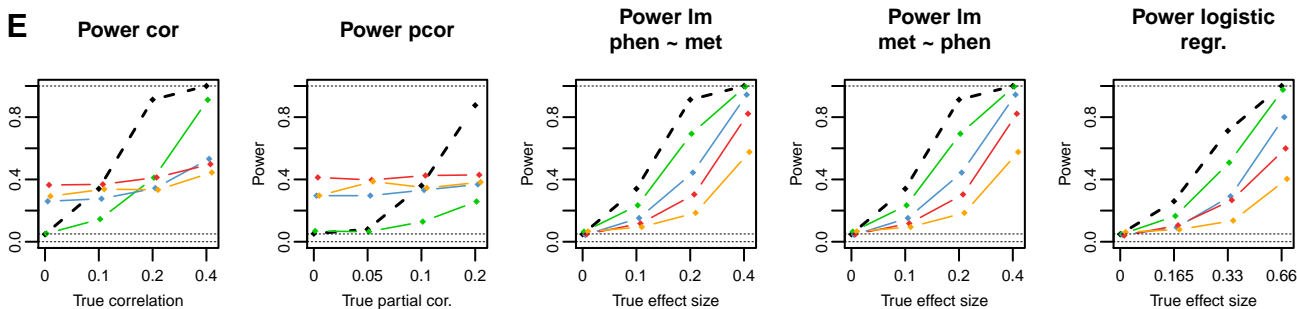
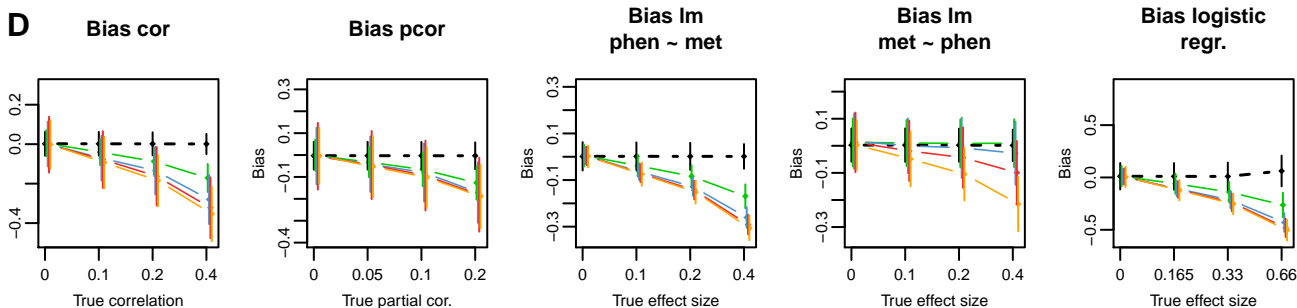
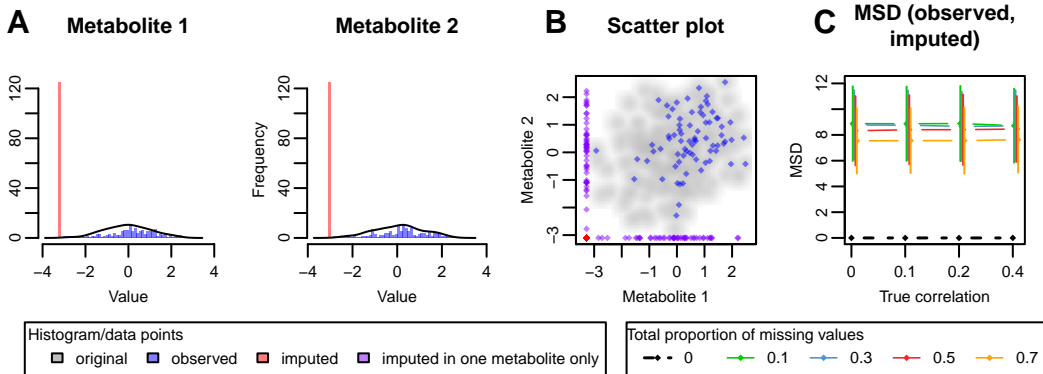
Kieu Trinh Do[¶], Simone Wahl[¶], Johannes Raffler, Sophie Molnos, Michael Laimighofer, Jerzy Adamski, Karsten Suhre, Konstantin Strauch, Annette Peters, Christian Gieger, Claudia Langenberg, Isobel D. Stewart, Fabian J. Theis, Harald Grallert, Gabi Kastenmüller[#], Jan Krumsiek[#]

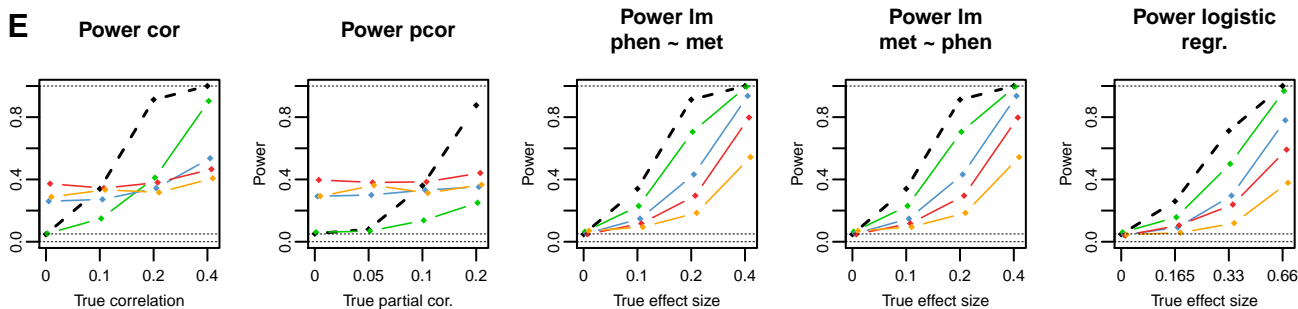
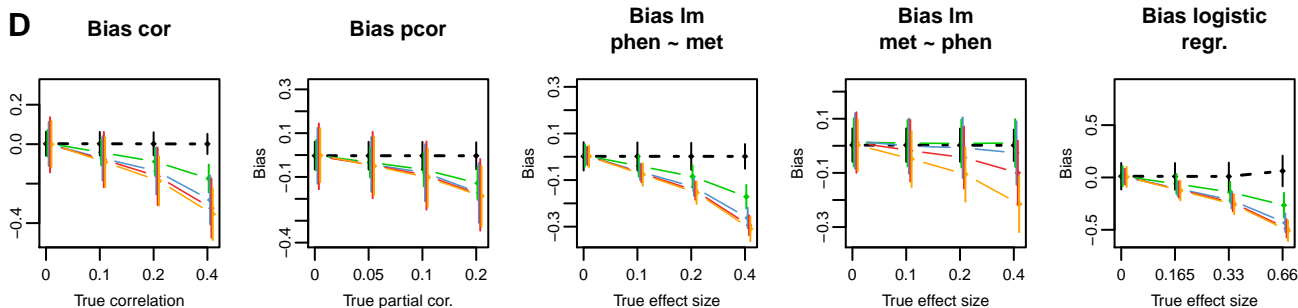
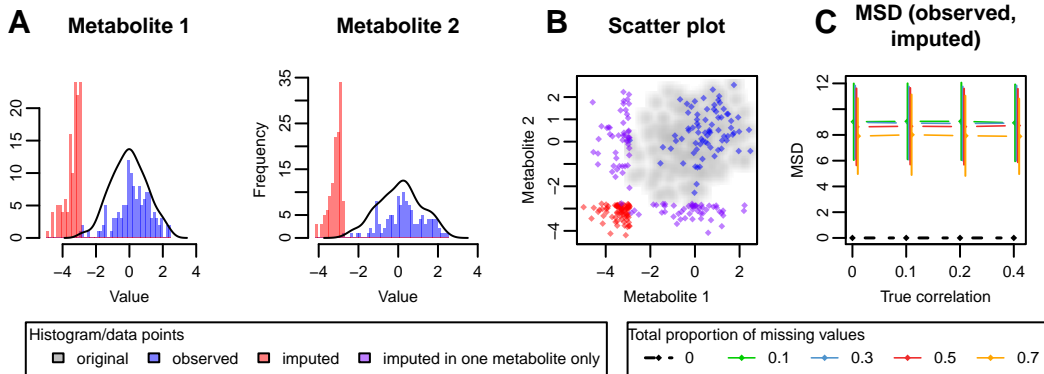
Supporting Information File S5: Evaluation results of the simulation study

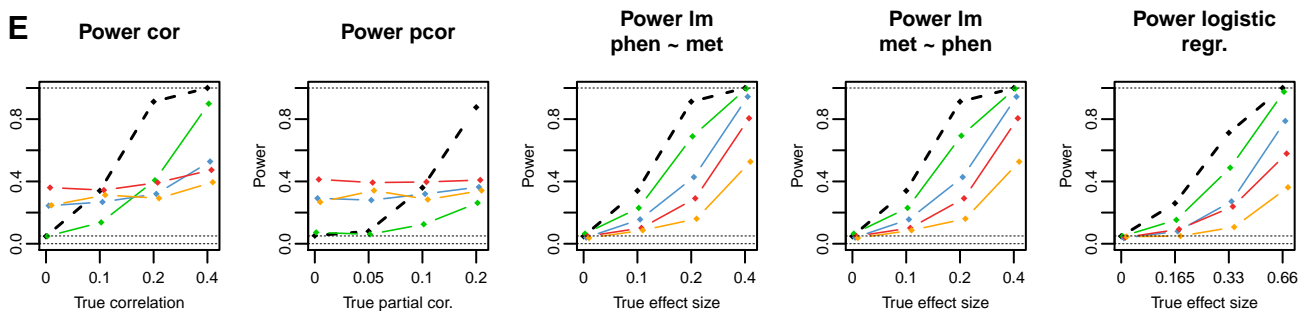
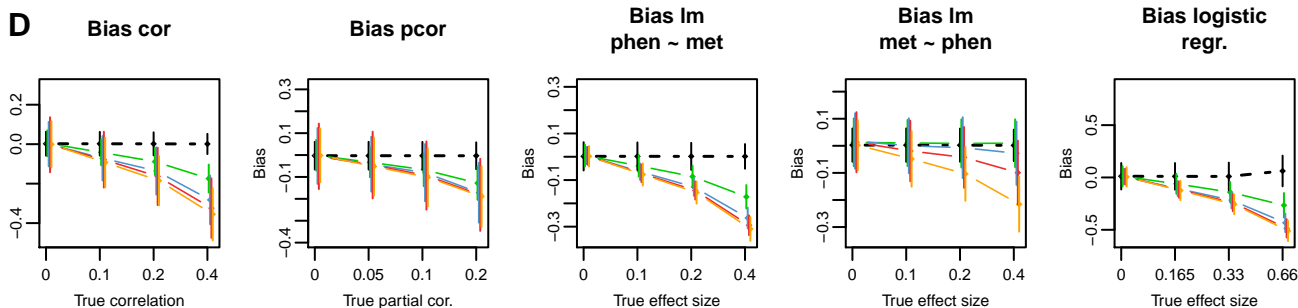
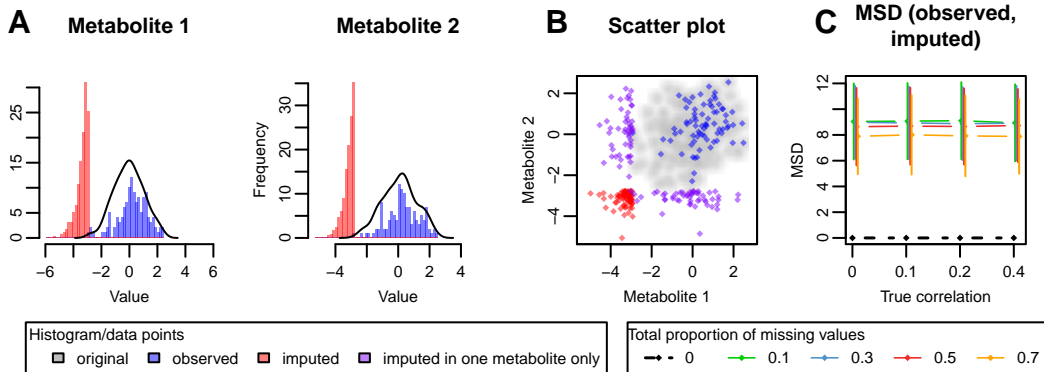
Shown are evaluation results for different simulated data scenarios. (A) Kernel density plots of original complete data of metabolites with histograms of observed (blue), imputed data points in one metabolite (violet), and imputed data points in both metabolites (red). (B) Scatterplots of metabolite 1 and metabolite 2. (C) Mean squared deviation (MSD) for different amount of missing values with increasing true effect. (D) Average absolute bias of Pearson correlation (cor), partial correlation (pcor), linear regression (lm), and logistic regression estimates (logistic regr.) for different amount of missing values with increasing true effect. Bias is defined as the estimate obtained from the respective imputation method minus true correlation, with mean \pm 1 SD across 250 simulations. (E) Power curves of hypothesis test for Pearson correlation, partial correlation, linear regression, and logistic regression analyses for different amount of missing values with increasing true effect. The y-axis shows the proportion of significant estimates among the 250 simulations; at null hypothesis correlation = 0, it shows the type 1 error, while power is reflected when true correlation is >0 .

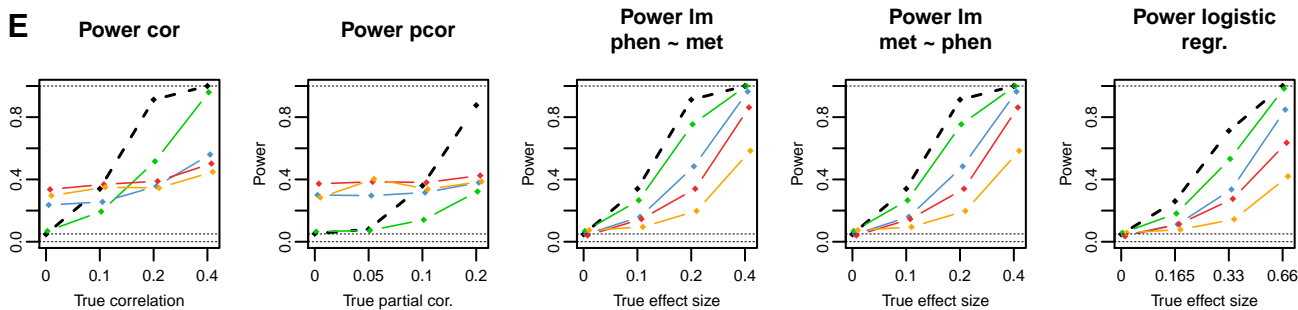
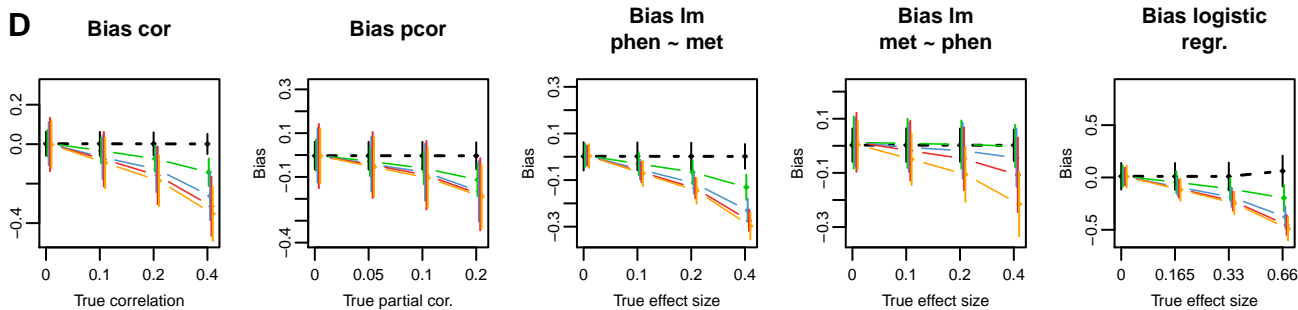
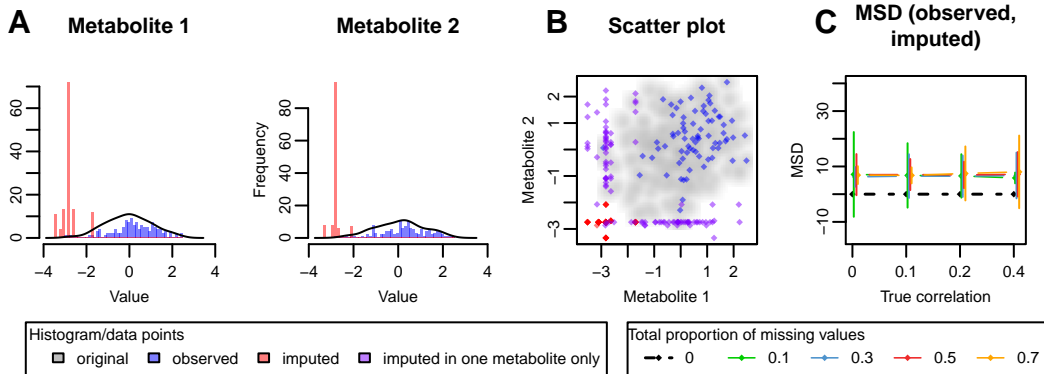




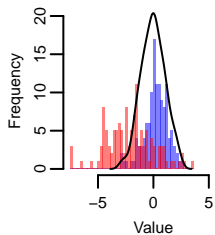




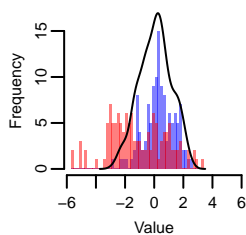




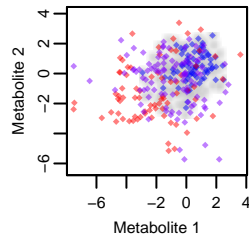
A Metabolite 1



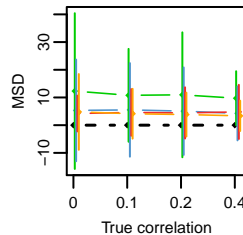
Metabolite 2



B Scatter plot



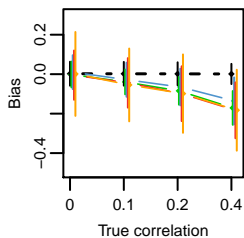
C MSD (observed, imputed)



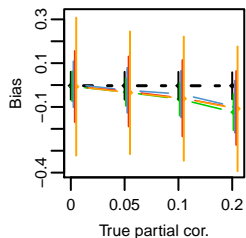
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 -●- 0 -●- 0.1 -●- 0.3 -●- 0.5 -●- 0.7

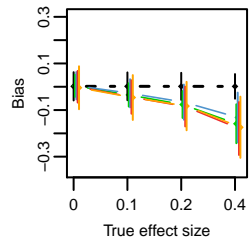
D Bias cor



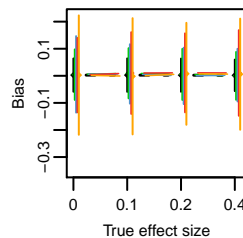
Bias pcor



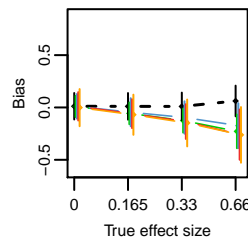
Bias lm phen ~ met



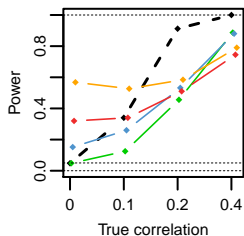
Bias lm met ~ phen



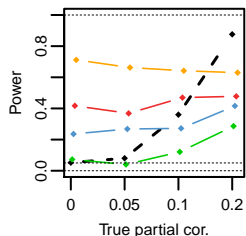
Bias logistic regr.



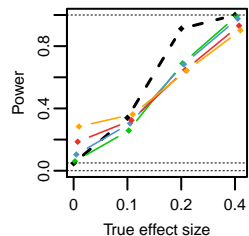
E Power cor



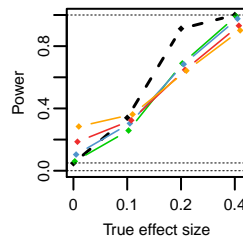
Power pcor



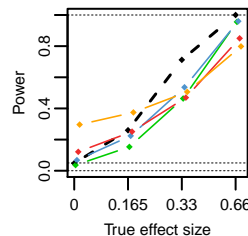
Power lm phen ~ met

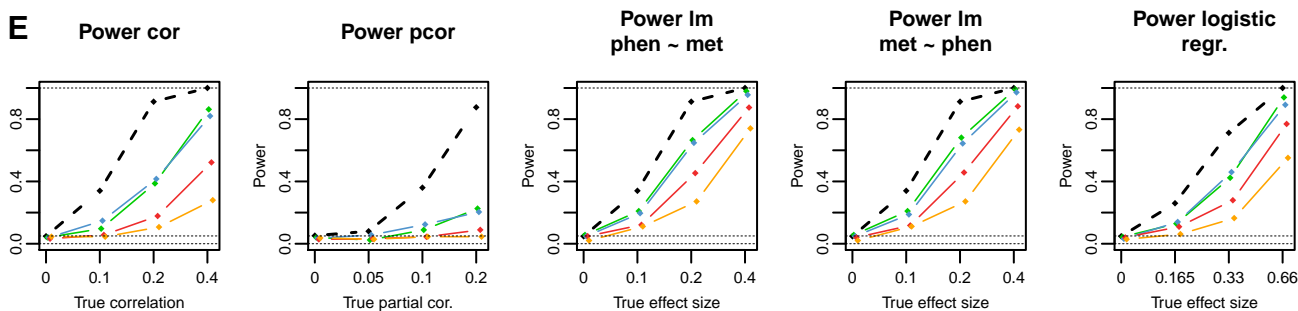
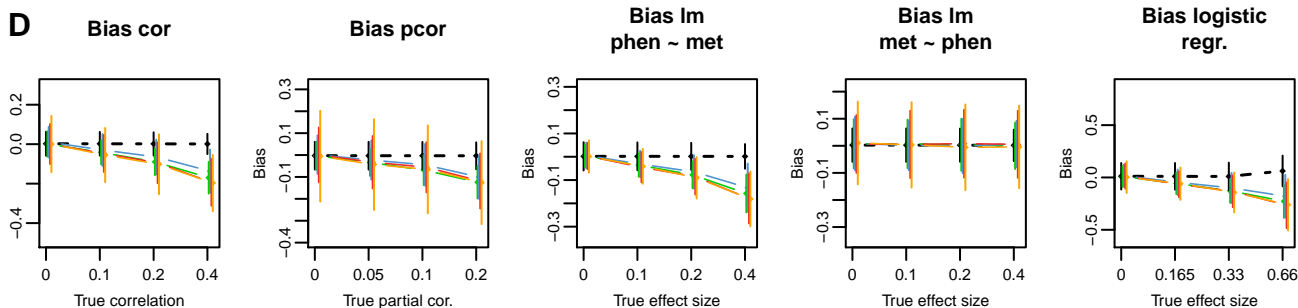
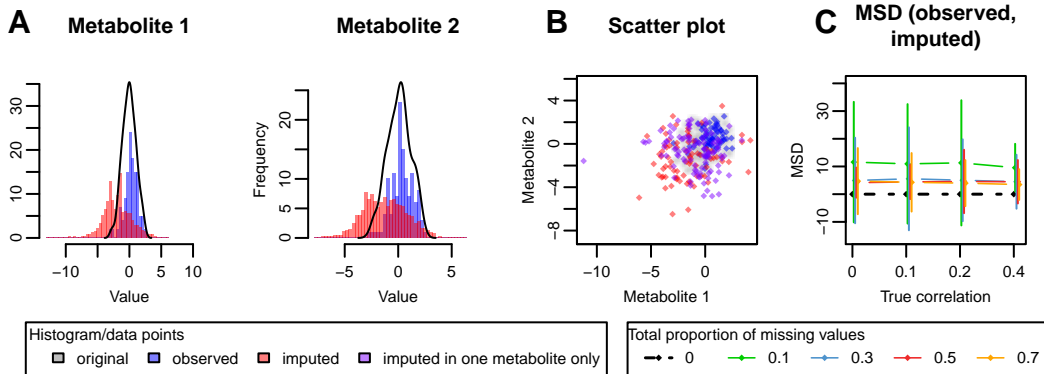


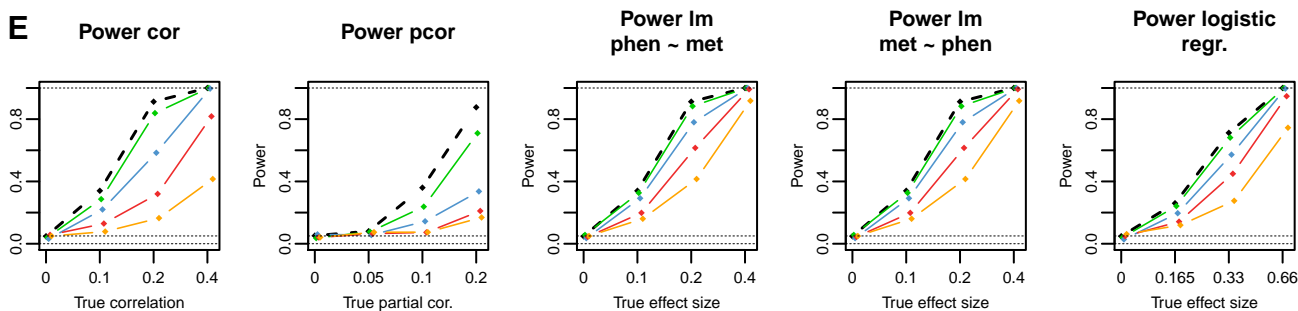
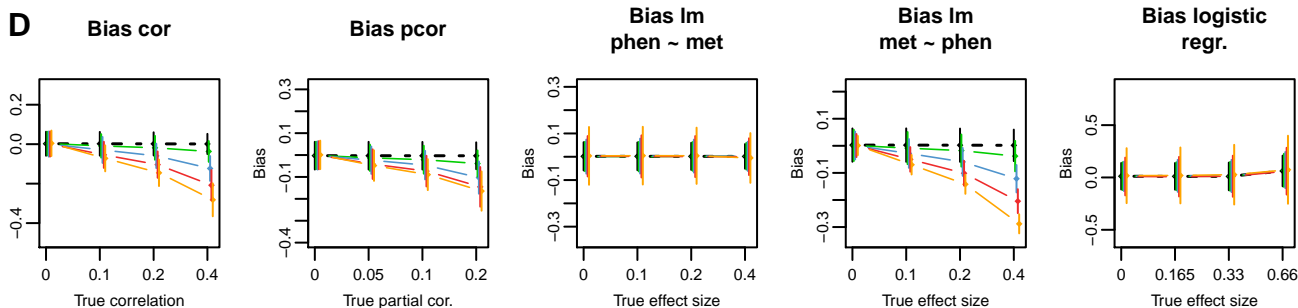
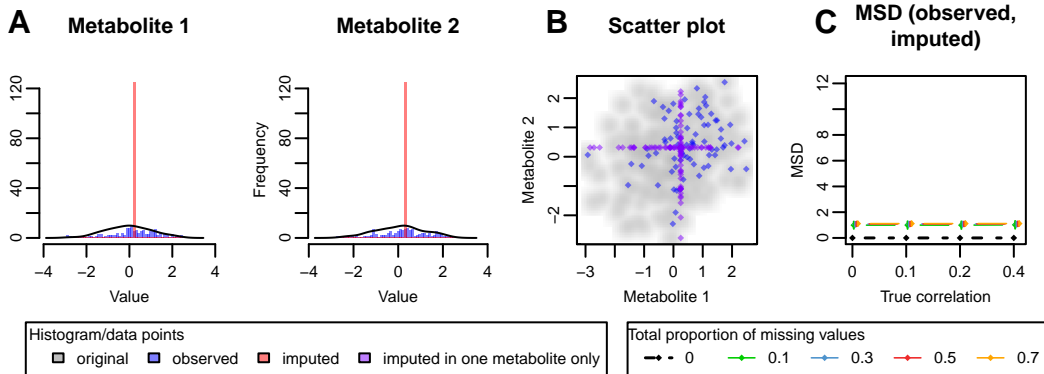
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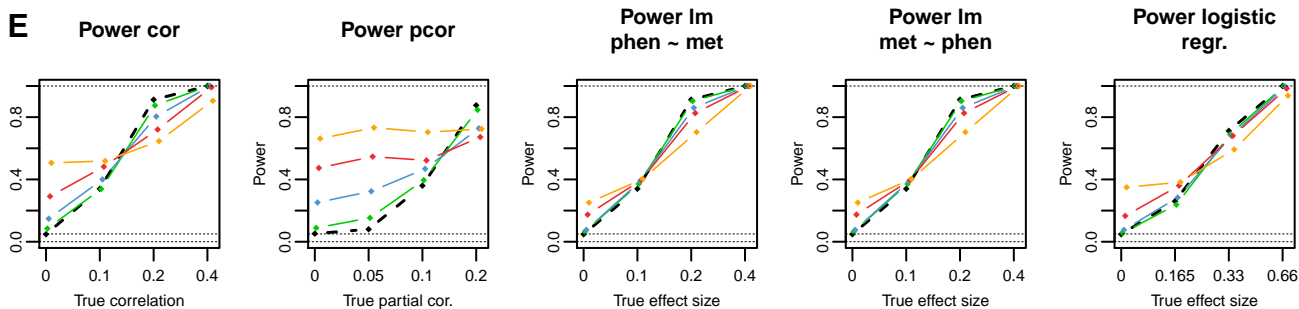
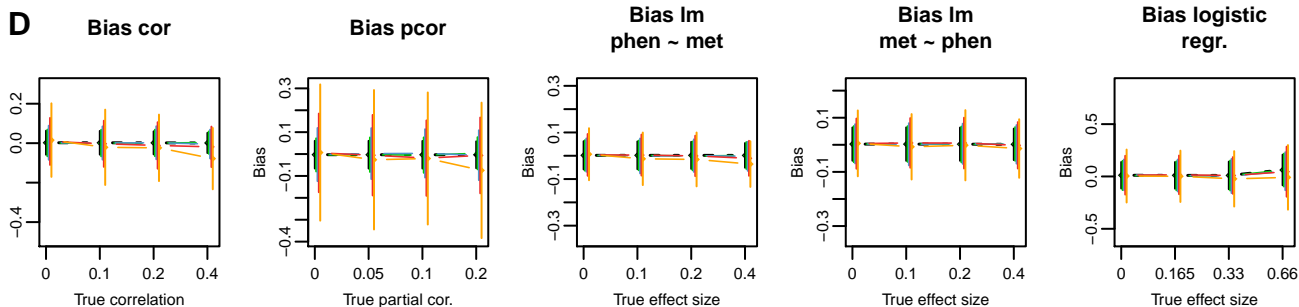
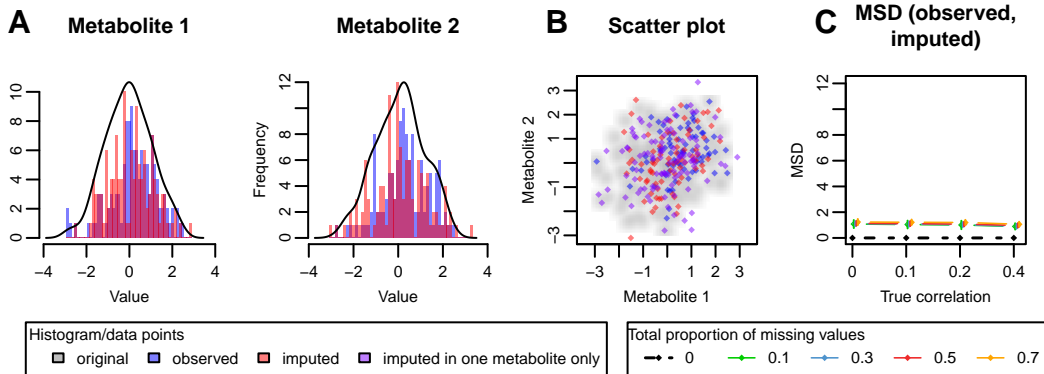


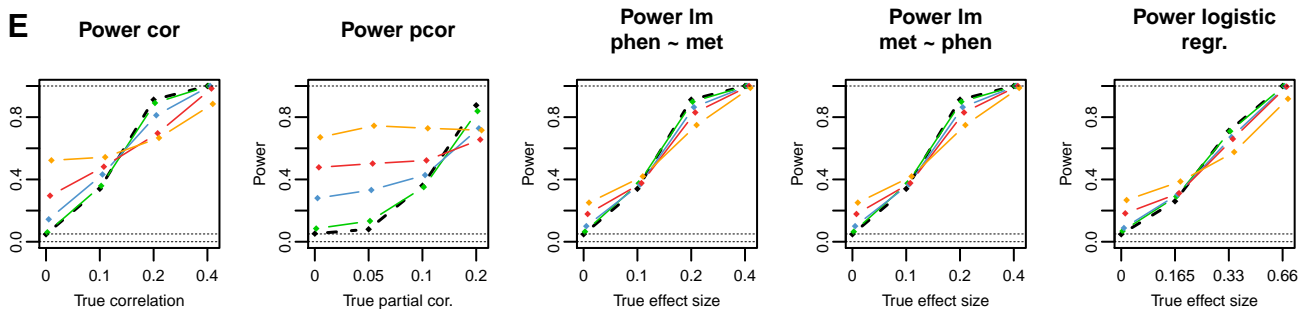
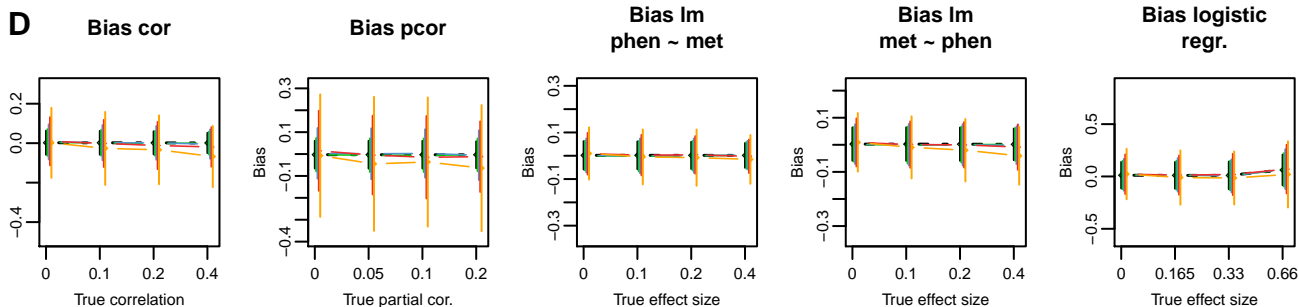
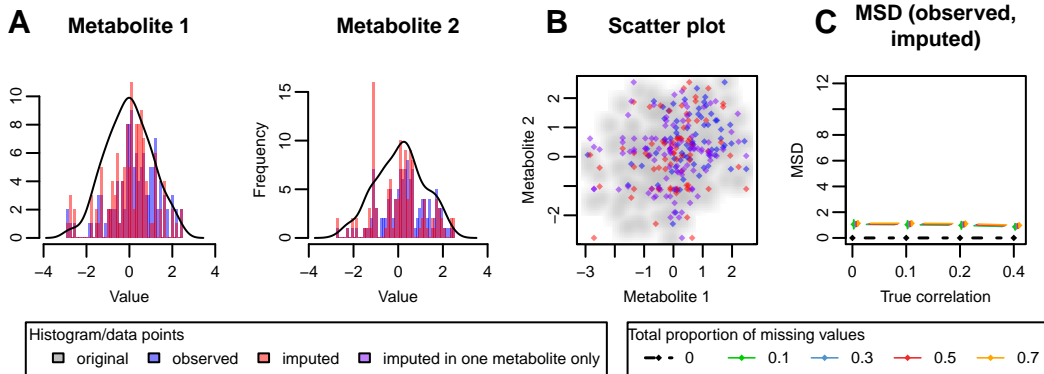
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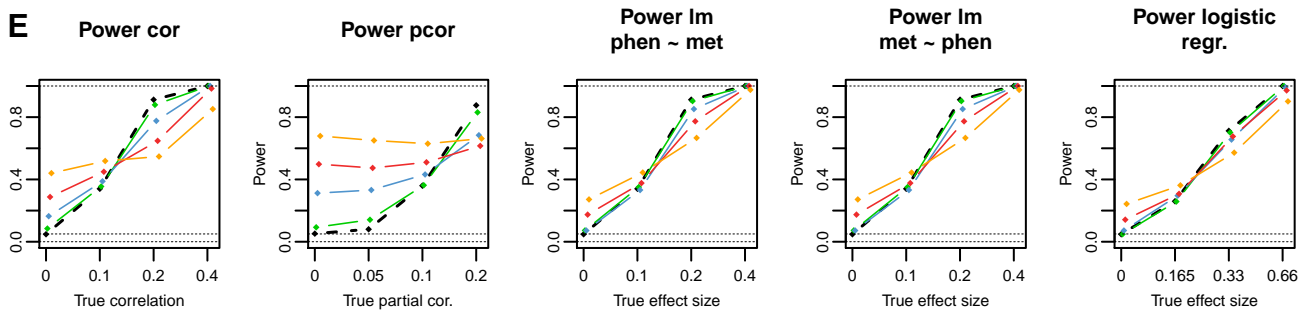
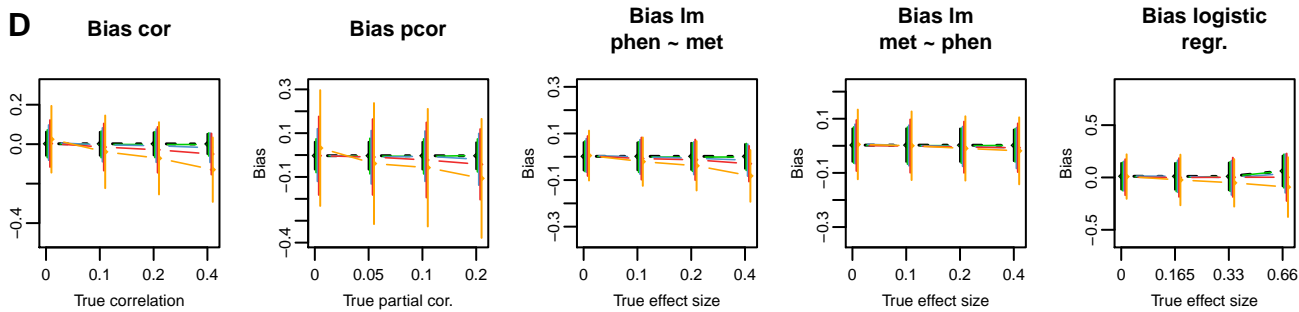
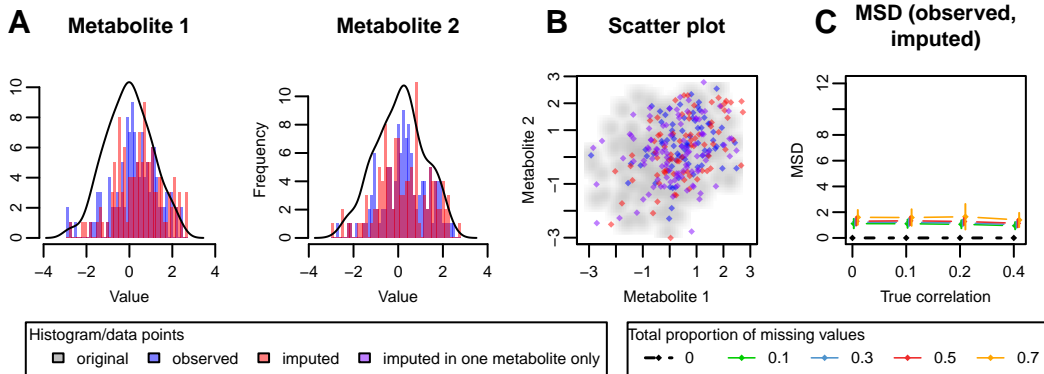


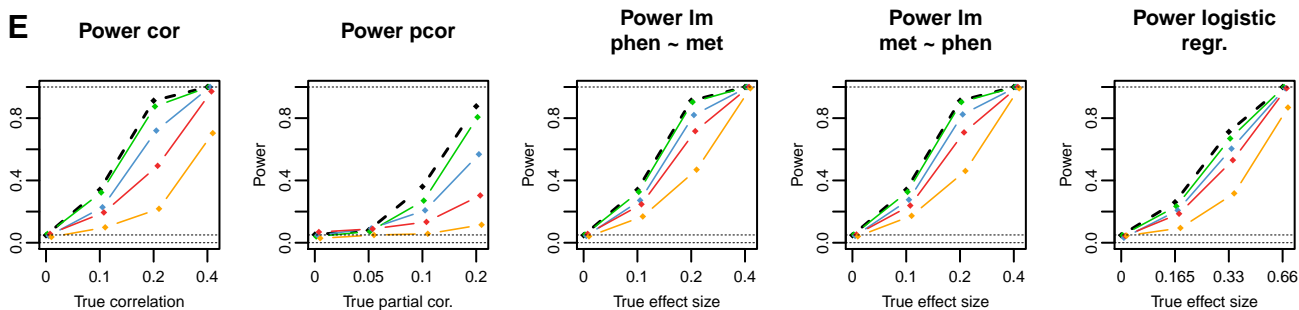
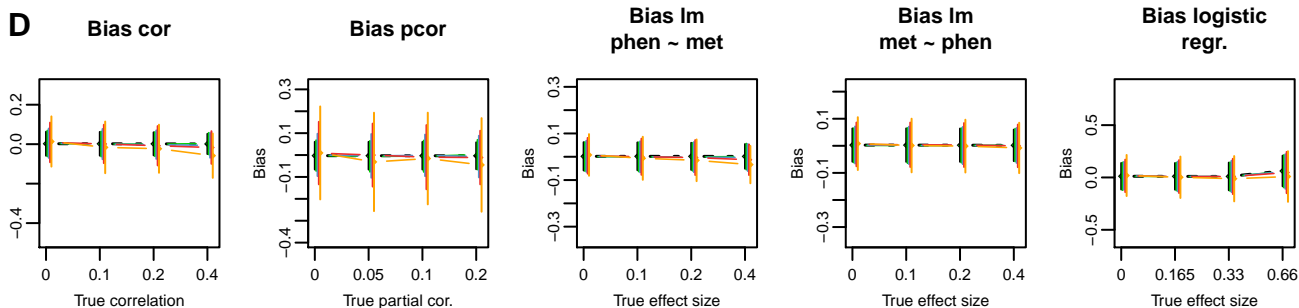
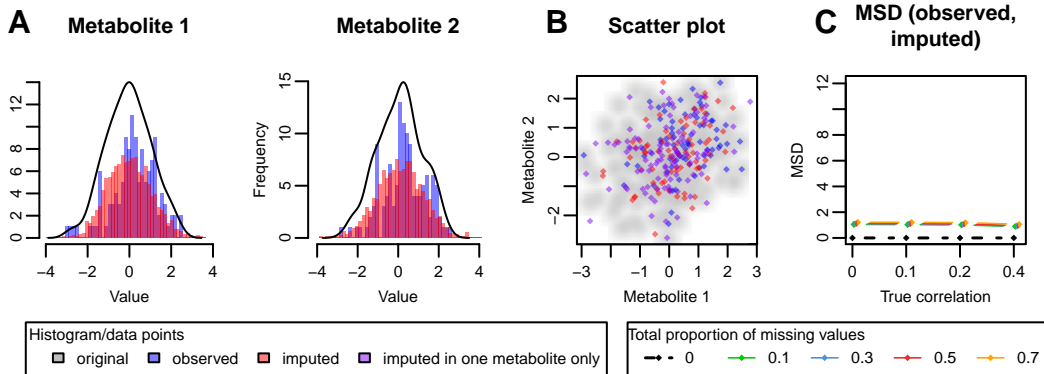


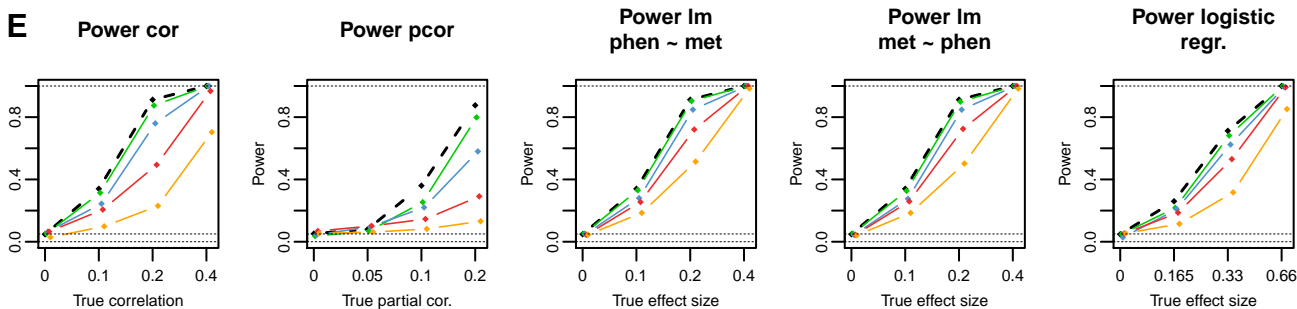
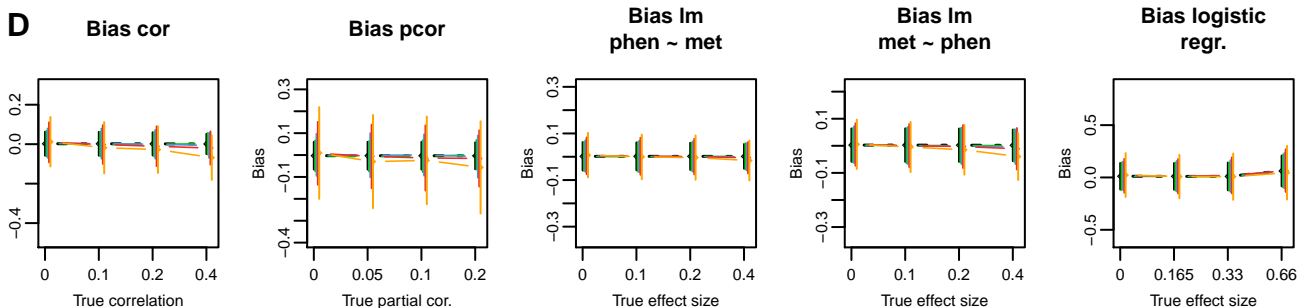
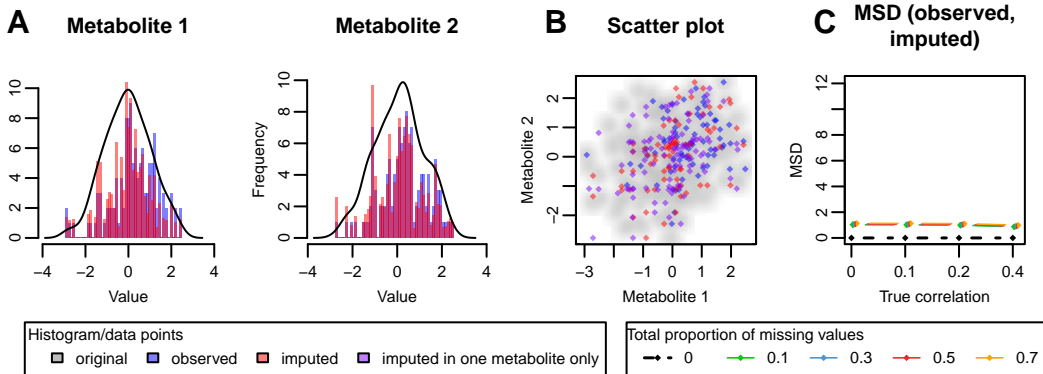


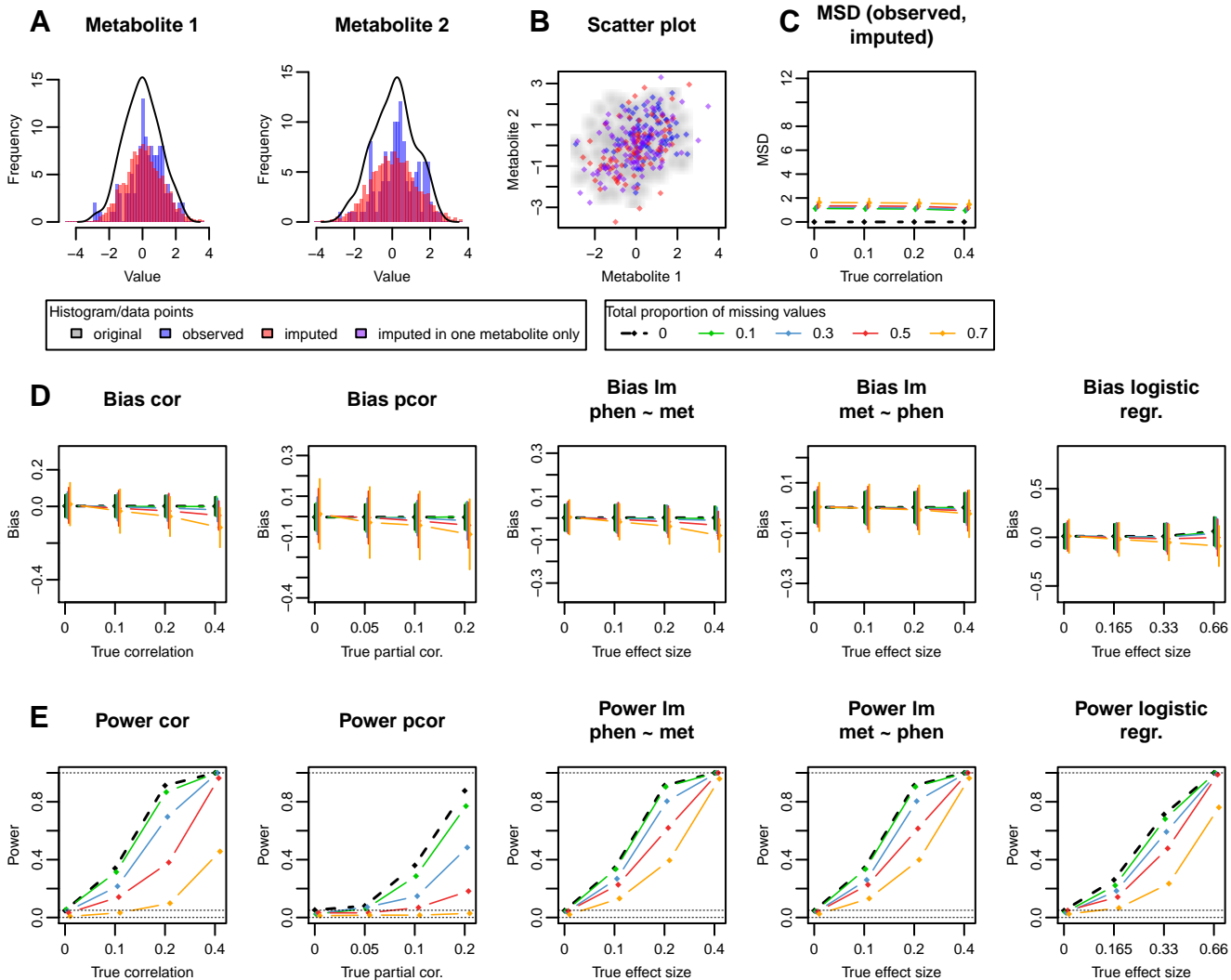


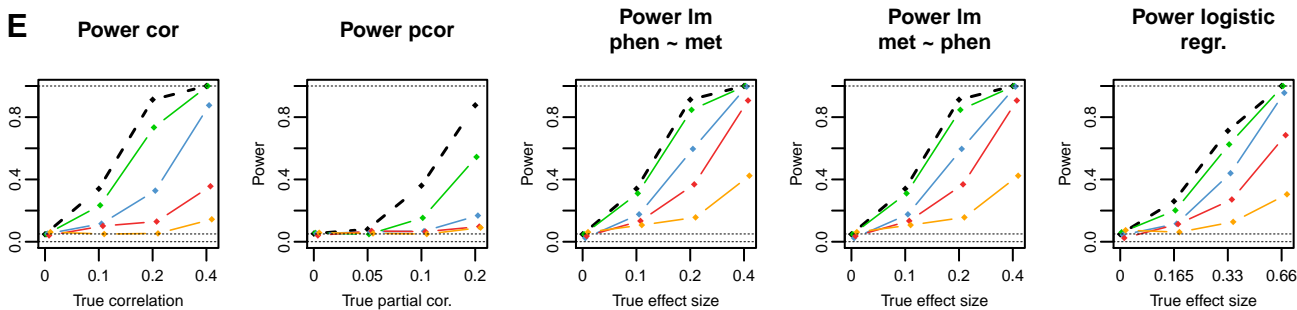
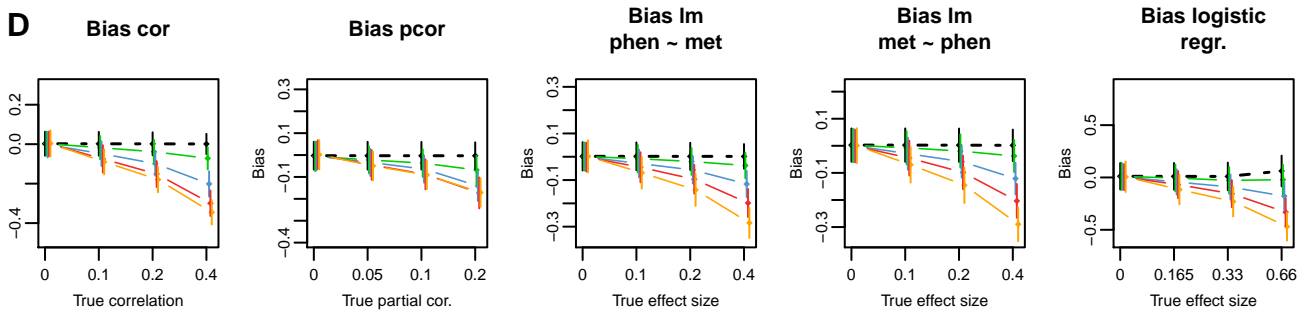
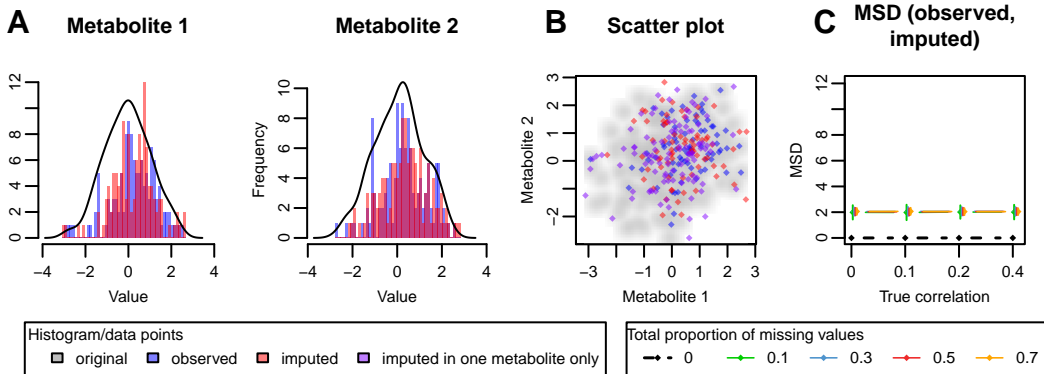


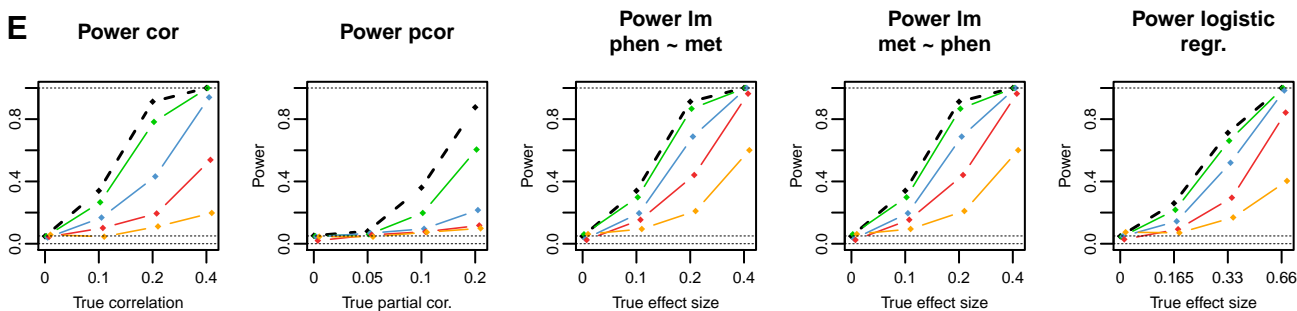
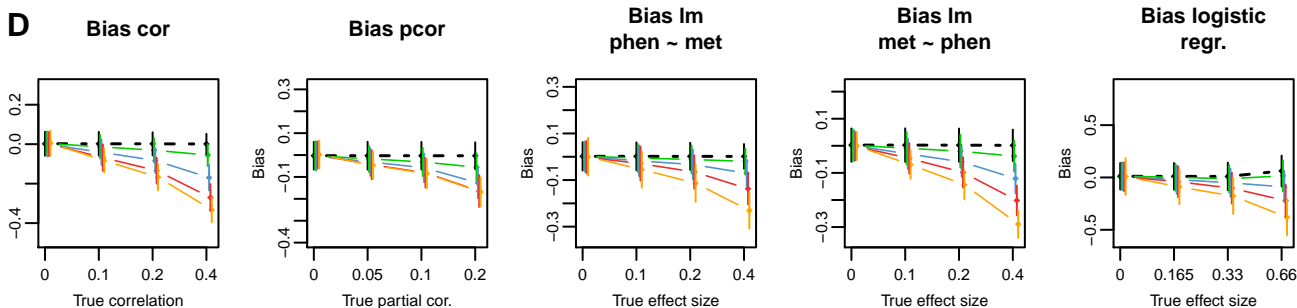
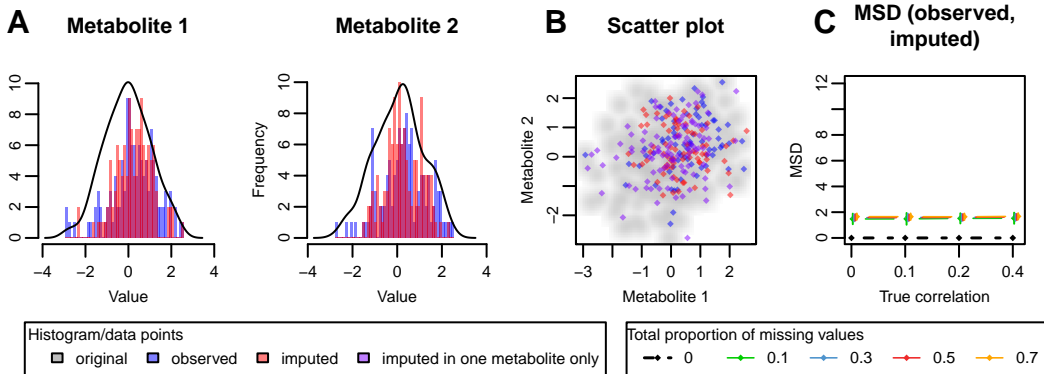


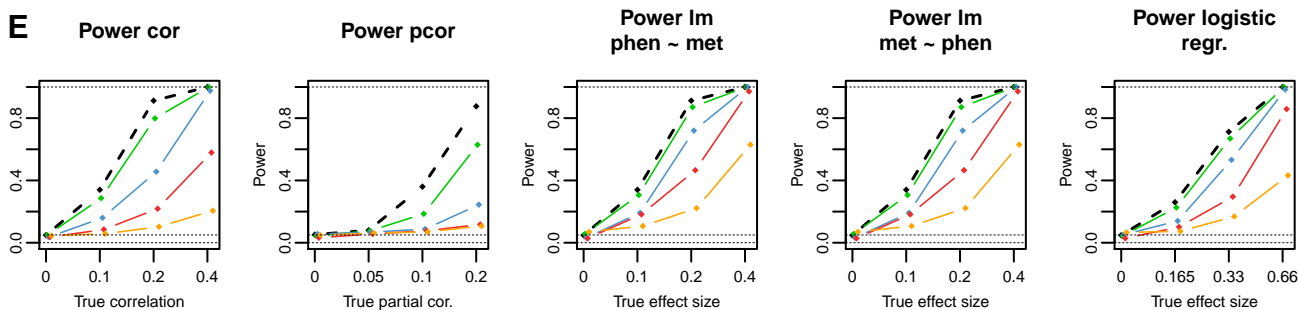
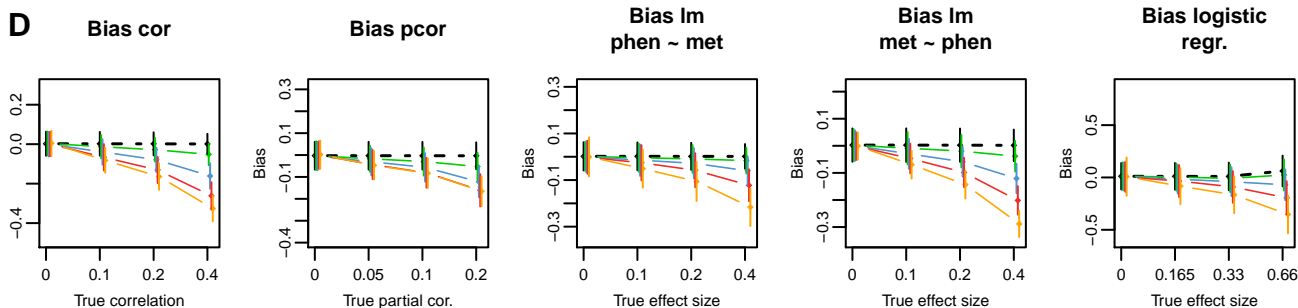
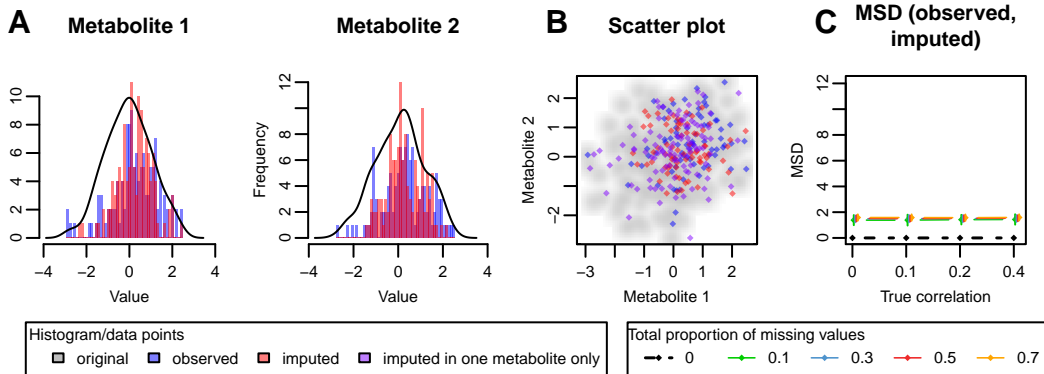


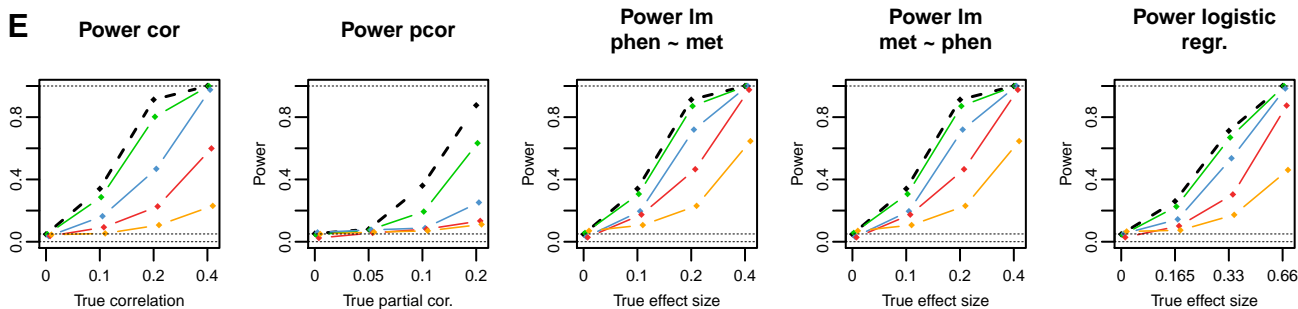
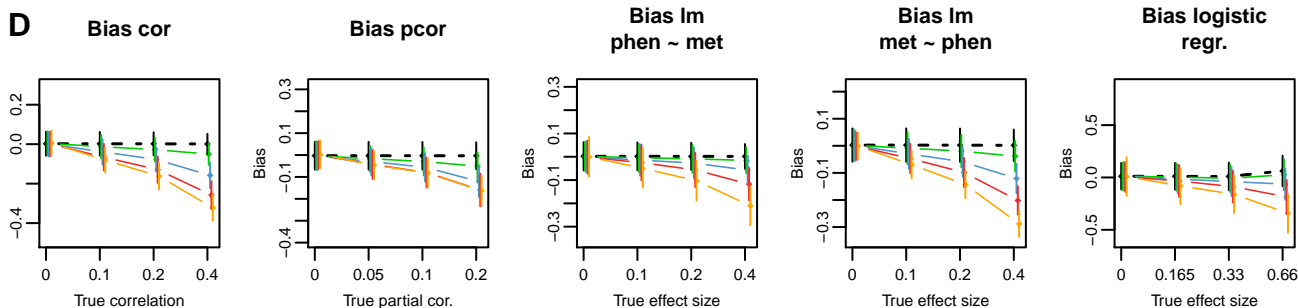
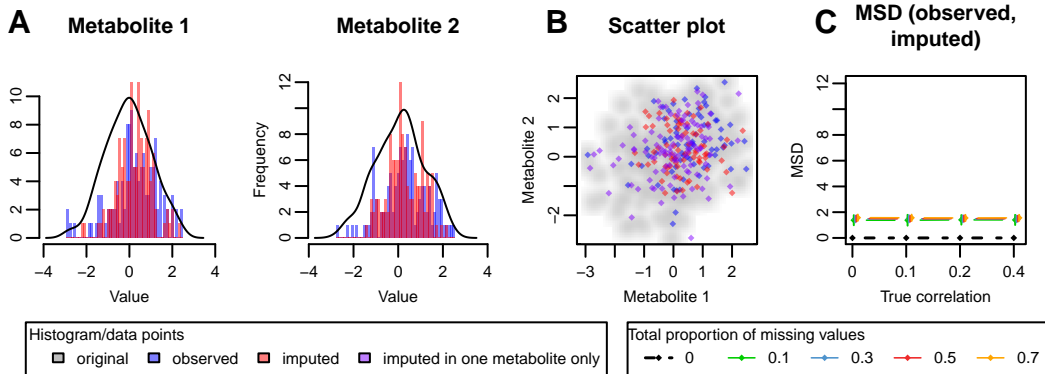


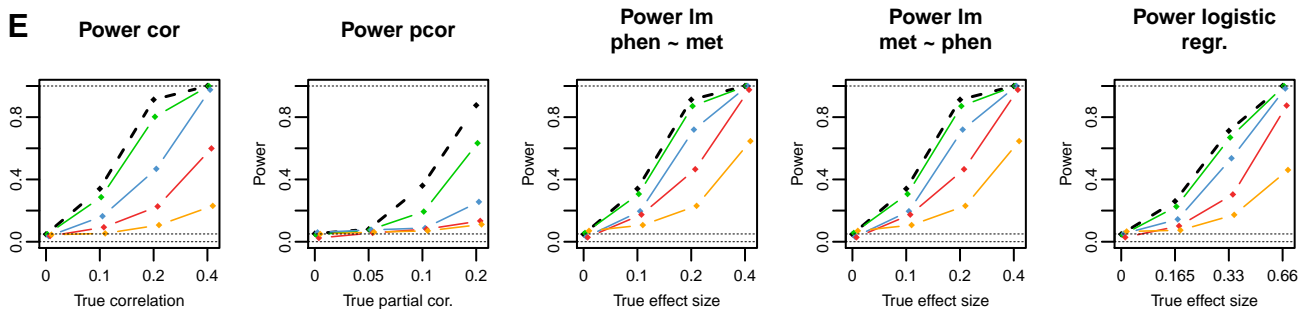
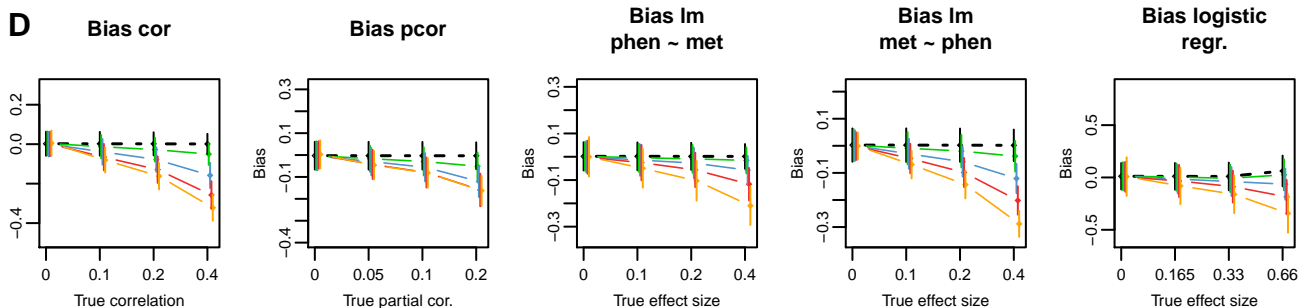
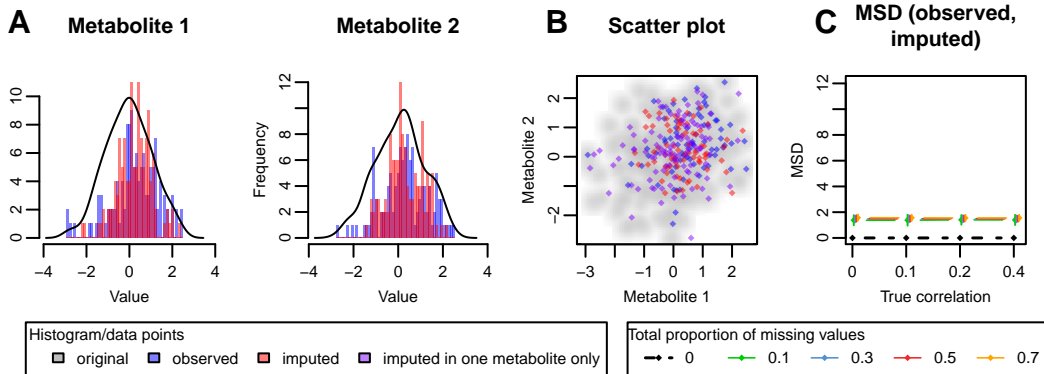


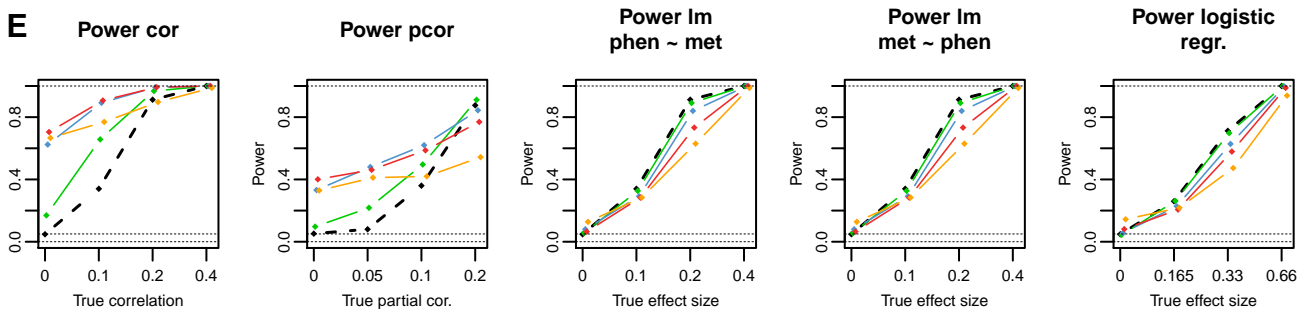
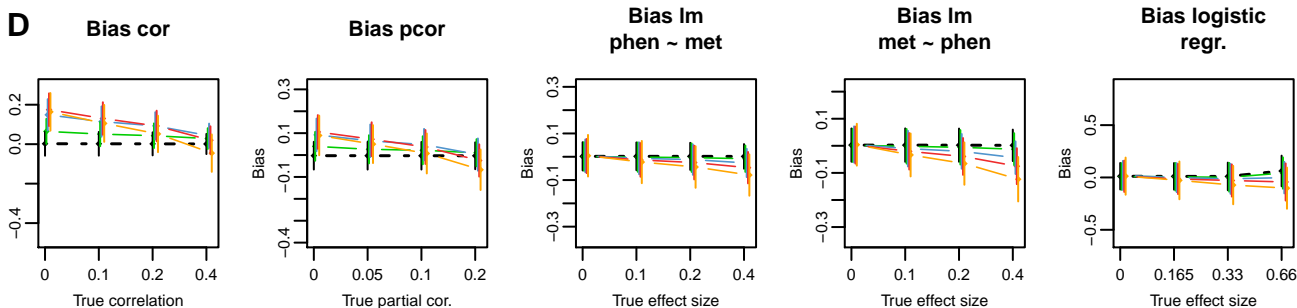
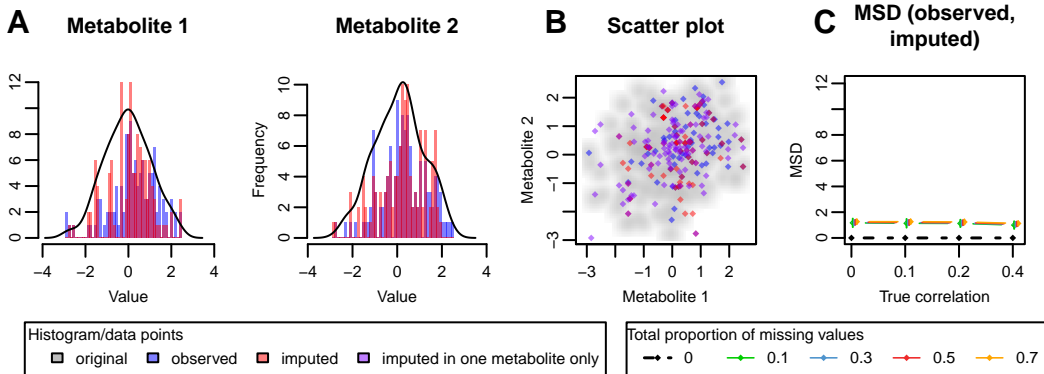


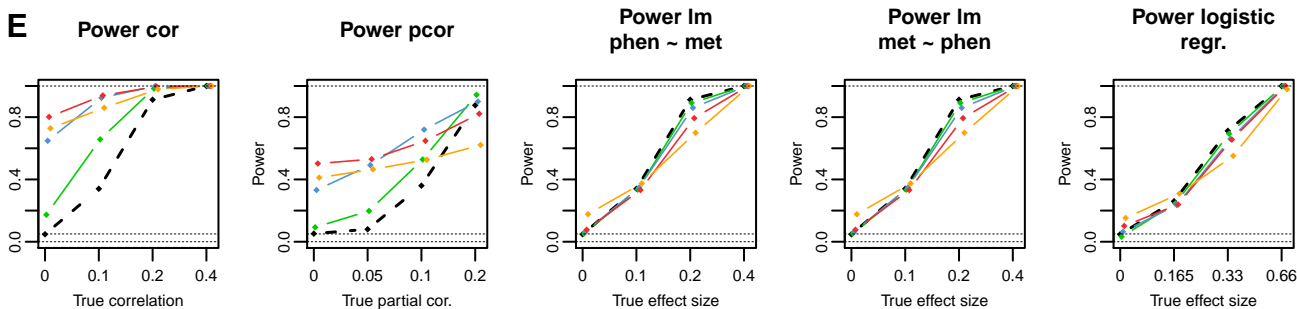
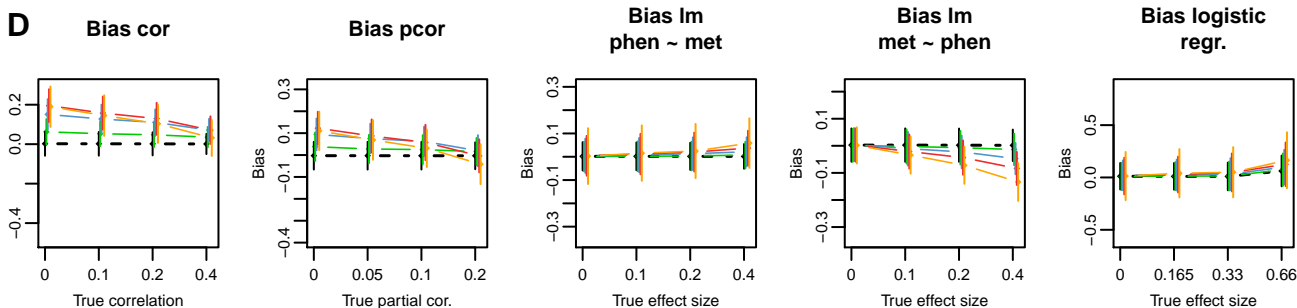
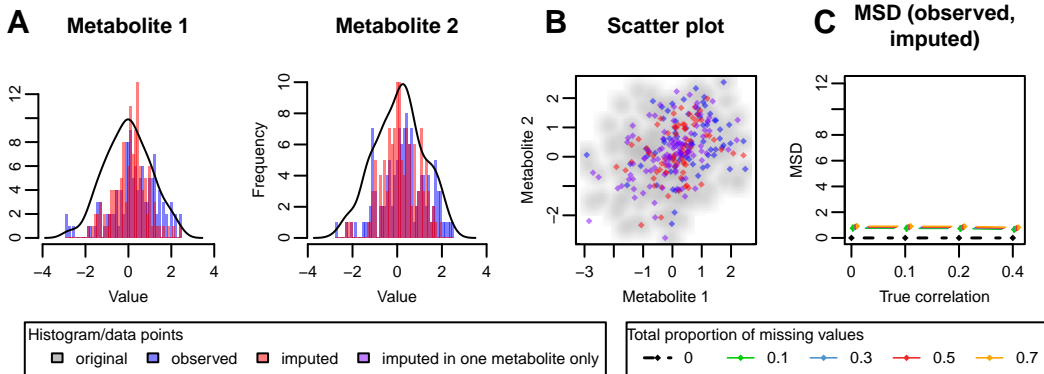


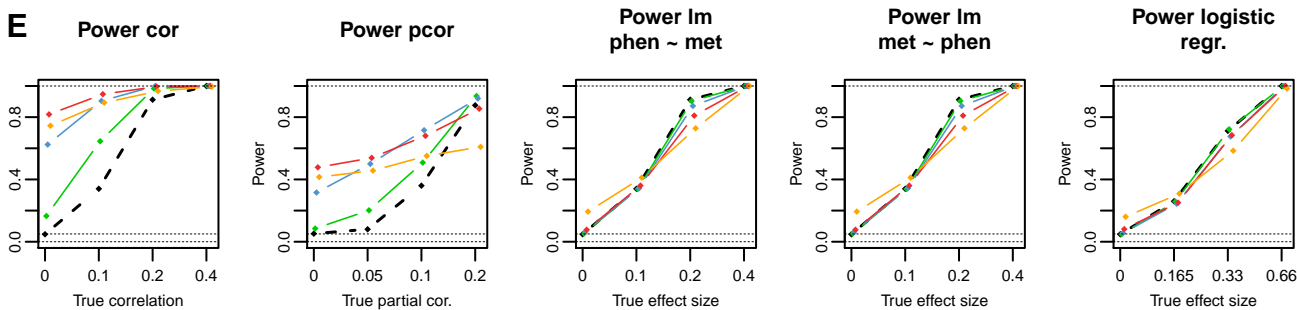
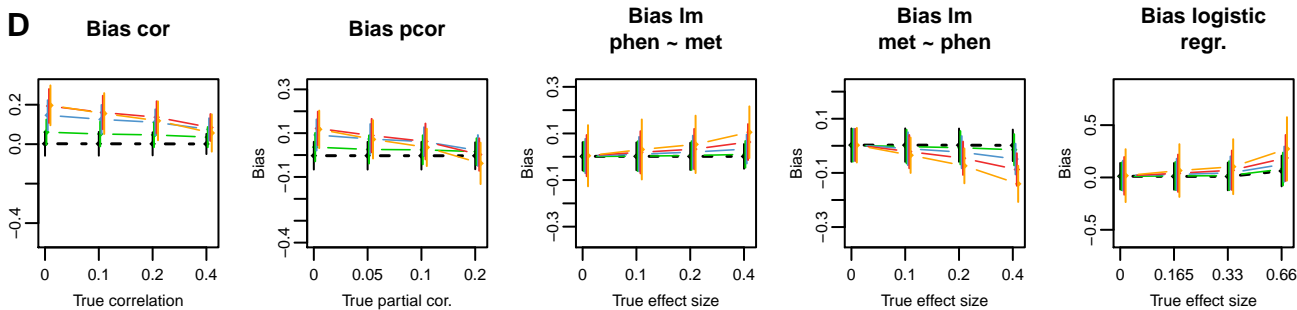
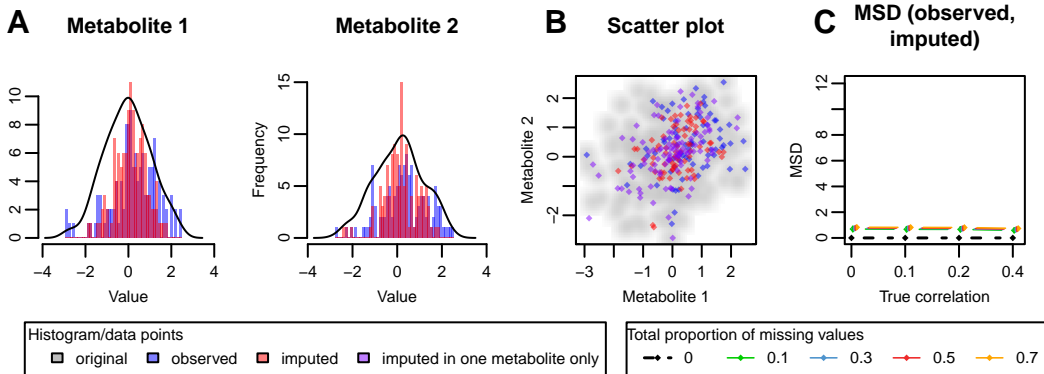


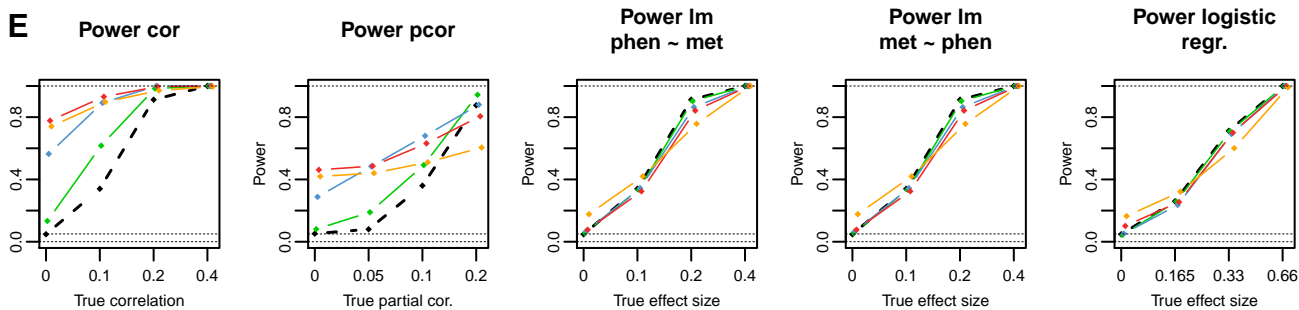
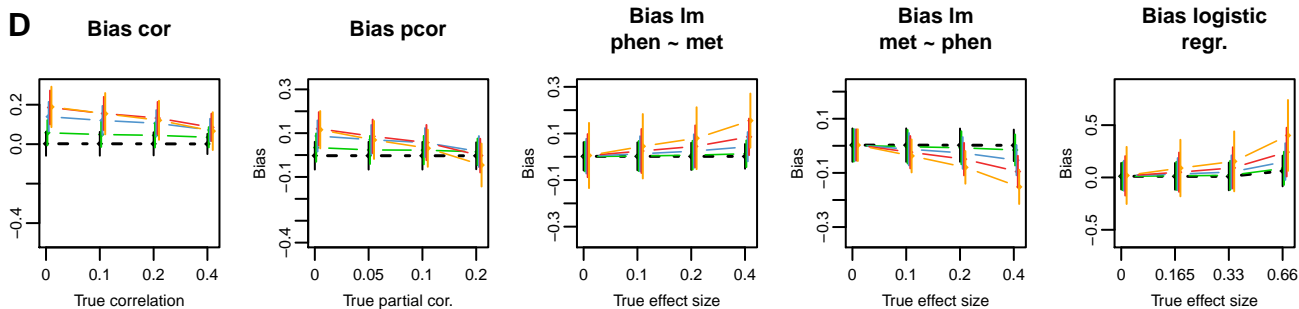
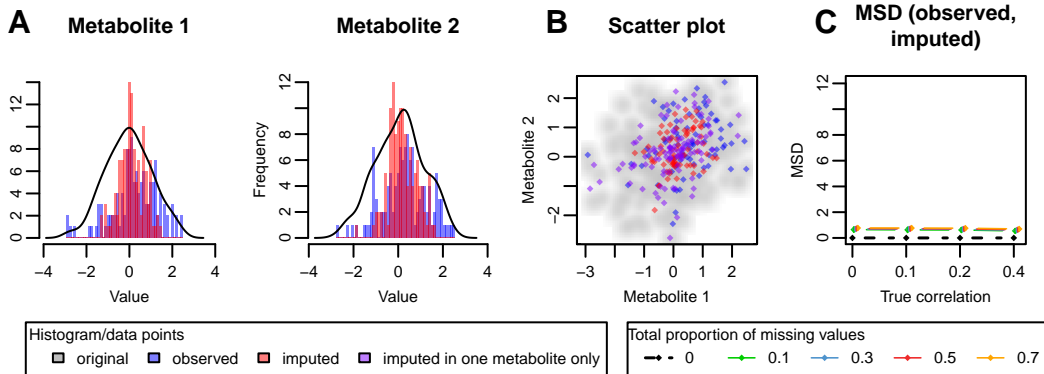


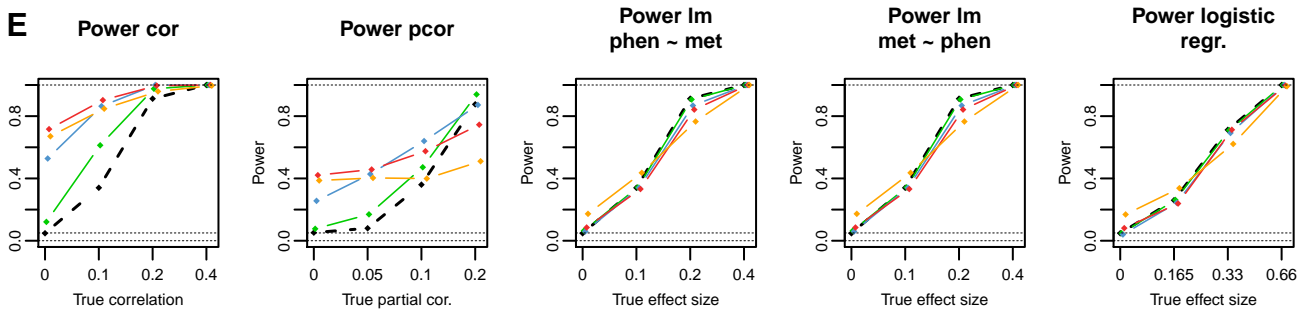
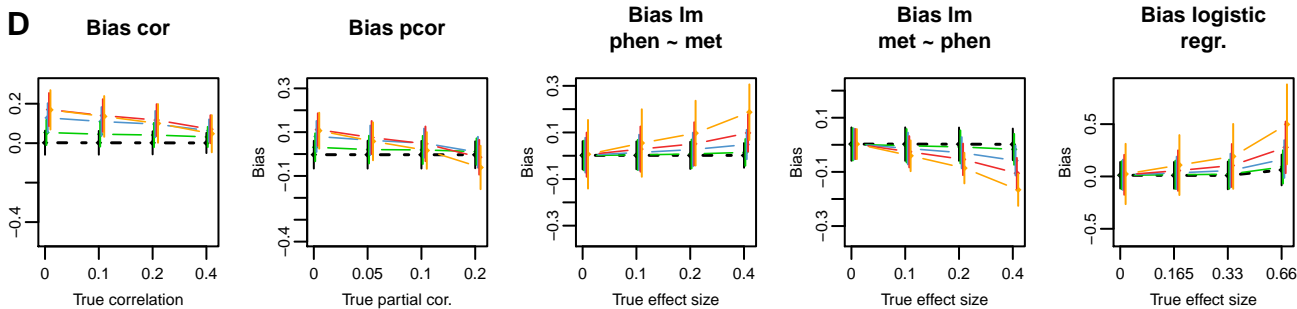
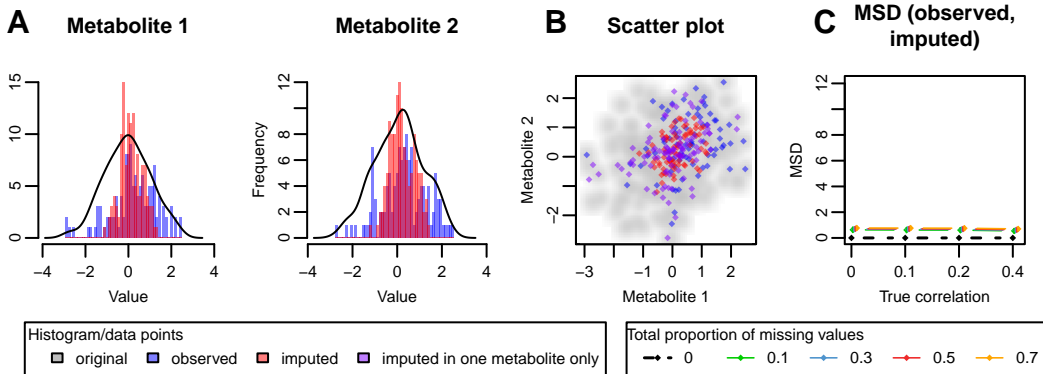


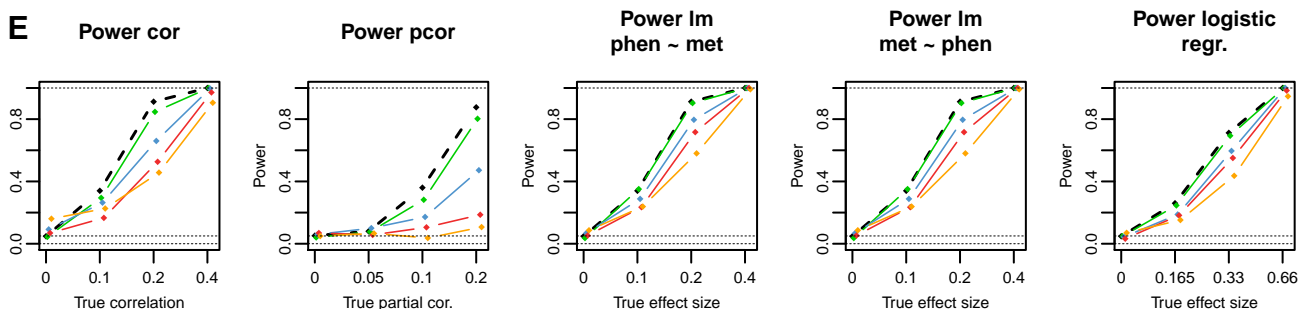
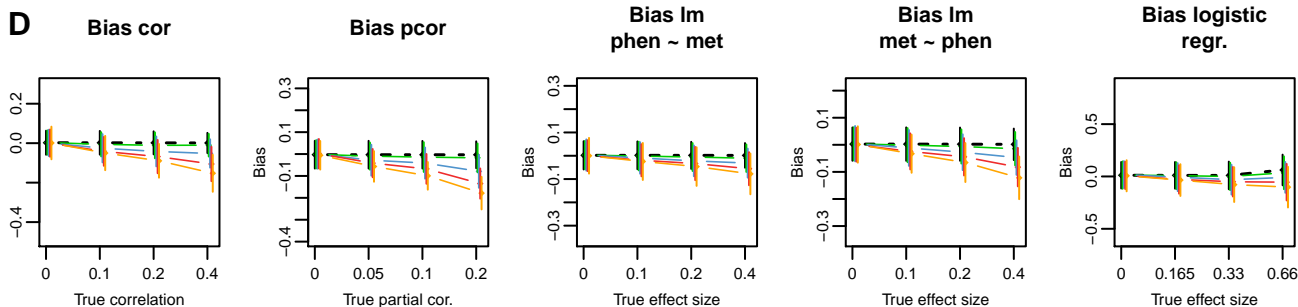
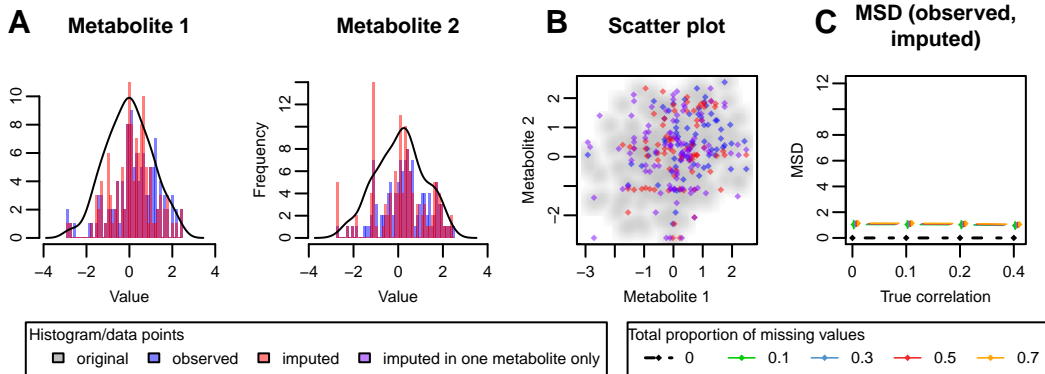


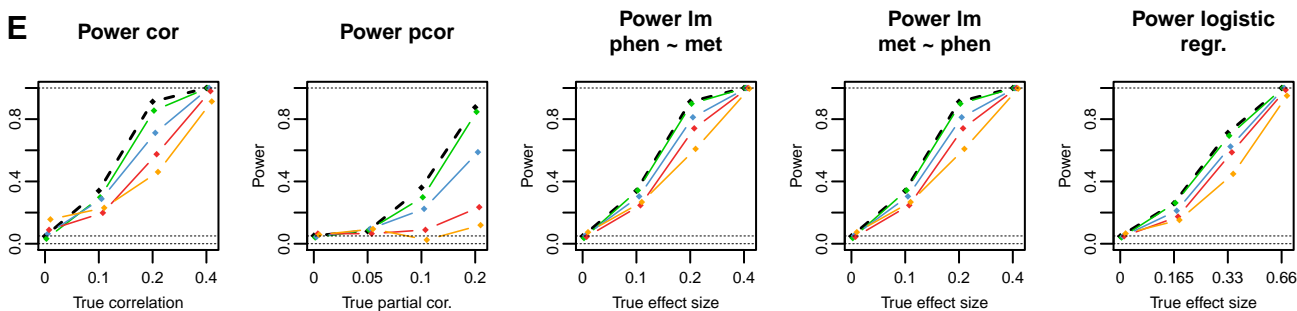
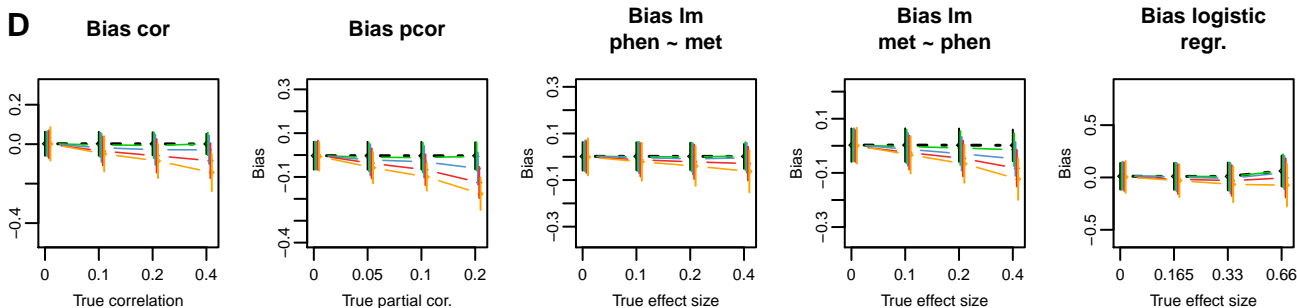
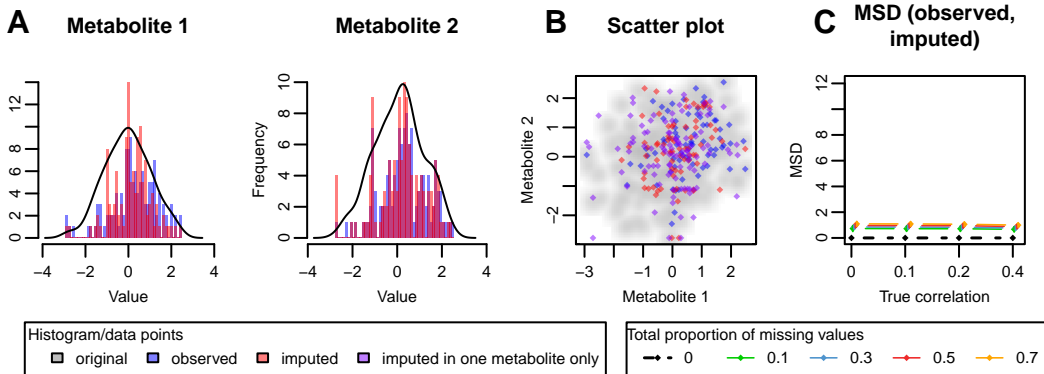


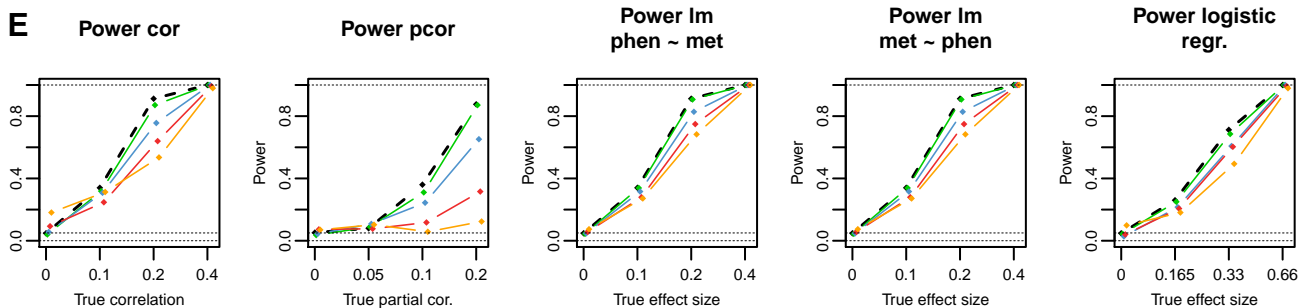
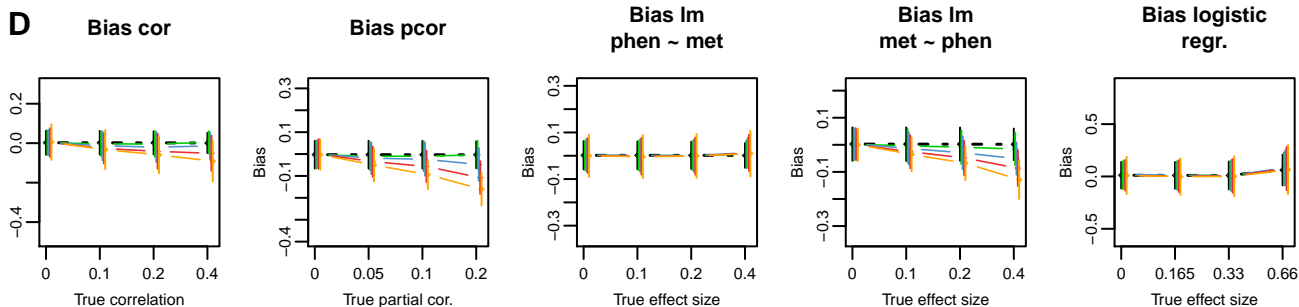
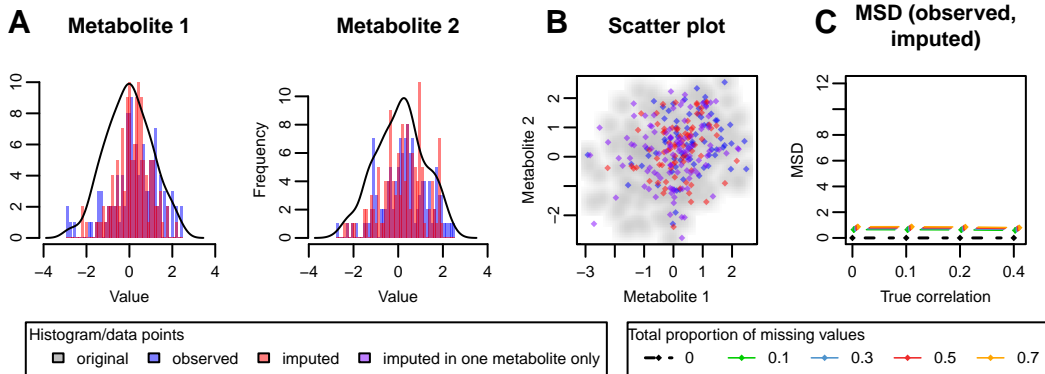


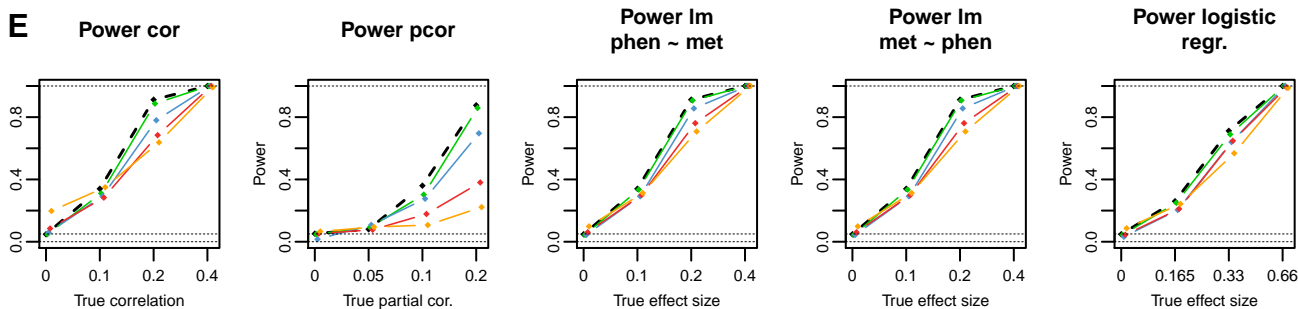
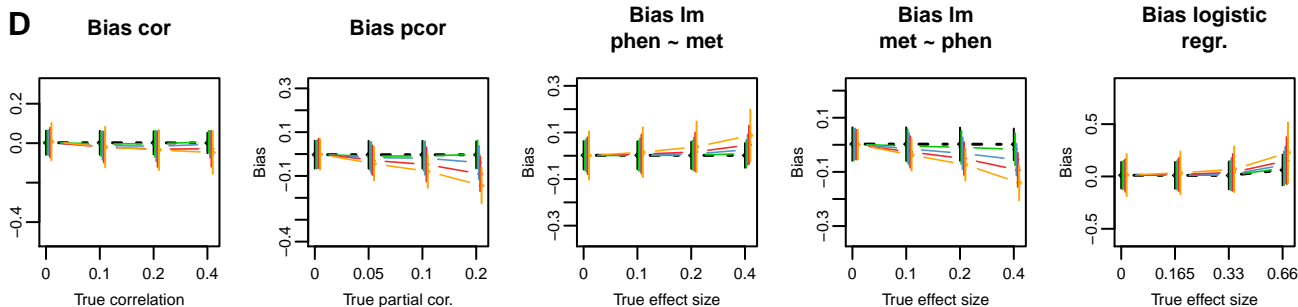
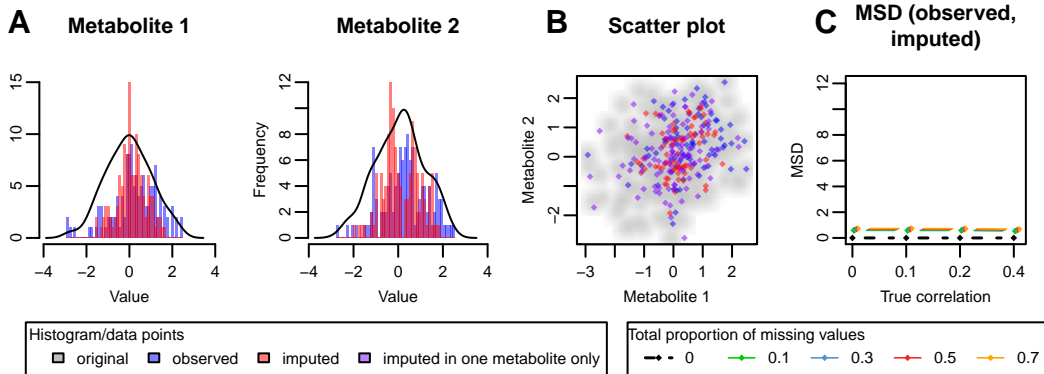


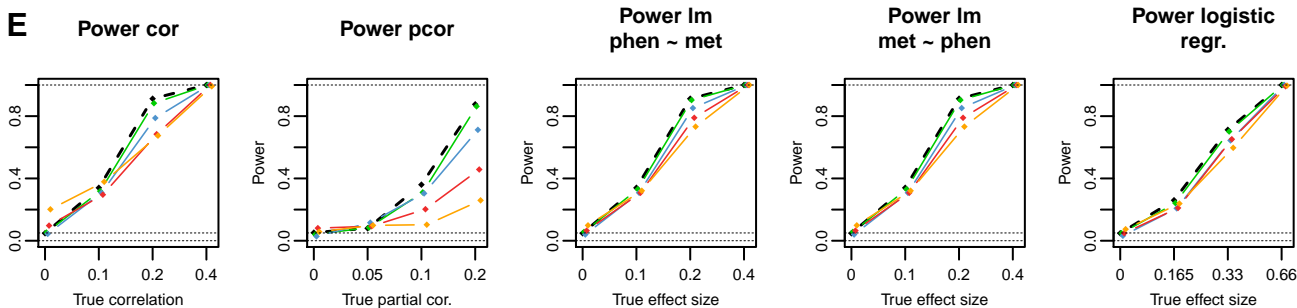
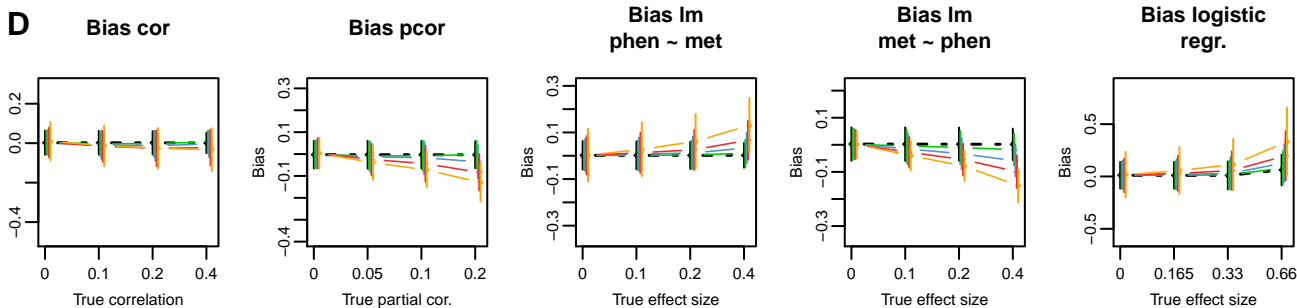
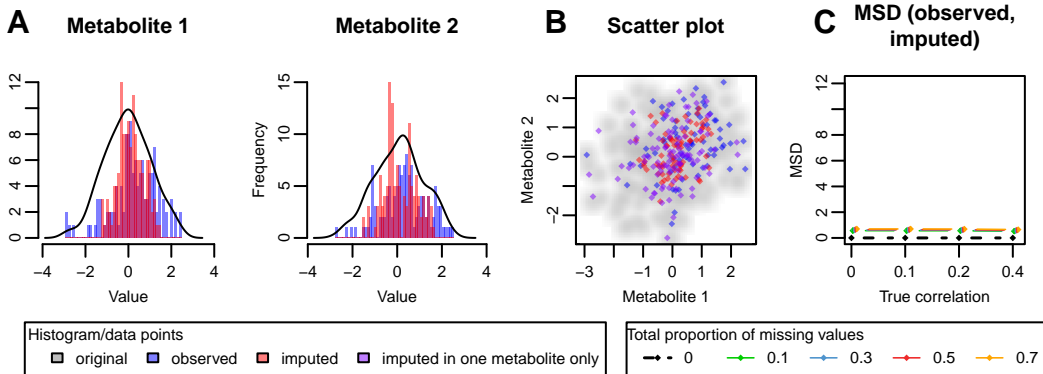


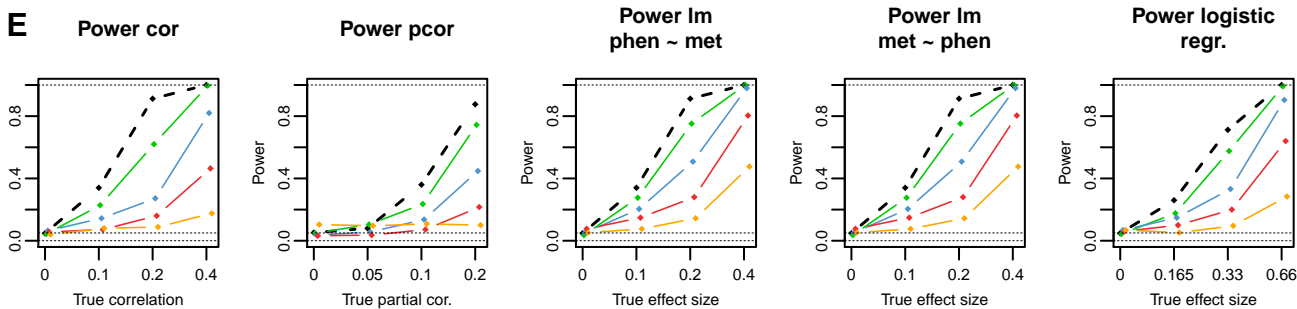
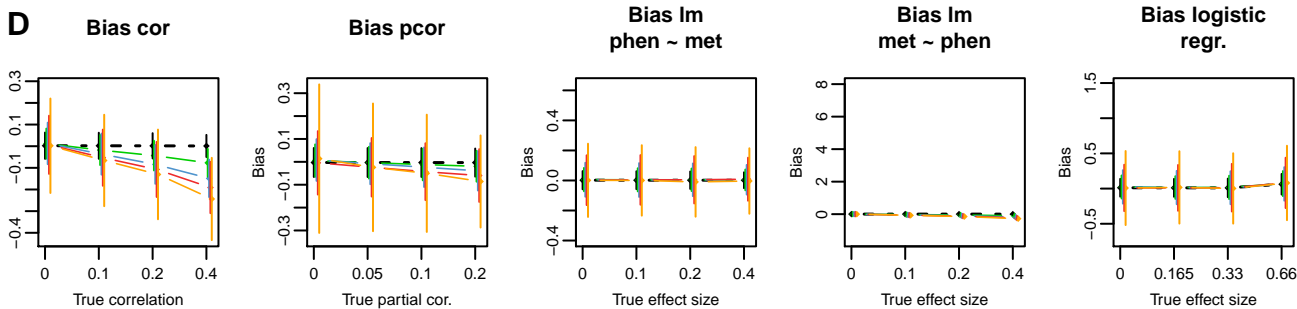
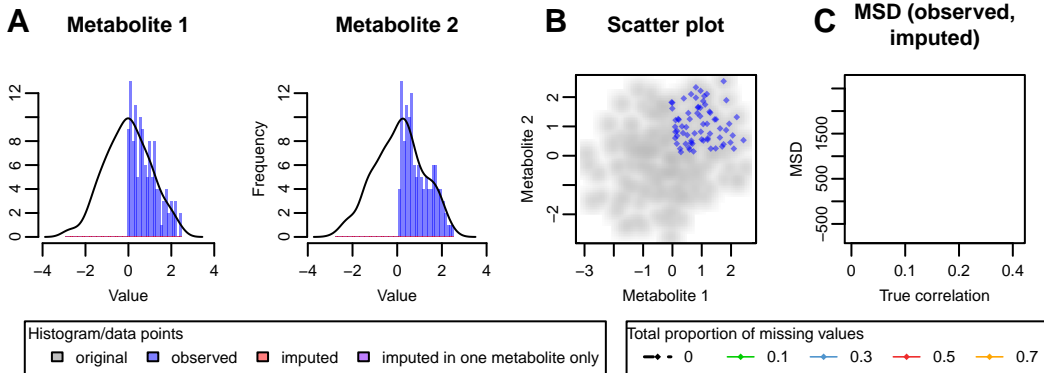




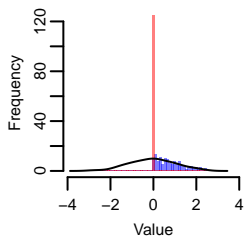




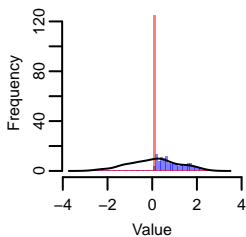




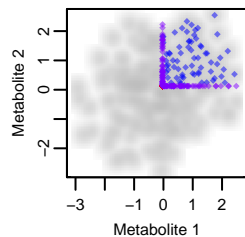
A Metabolite 1



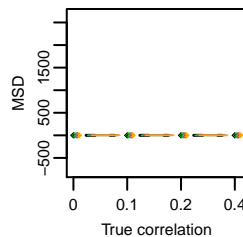
Metabolite 2



B Scatter plot



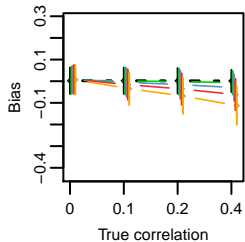
C MSD (observed, imputed)



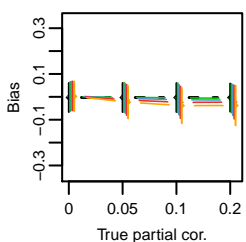
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 ● - 0 ● 0.1 ● 0.3 ● 0.5 ● 0.7

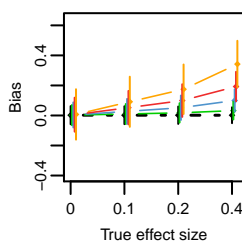
D Bias cor



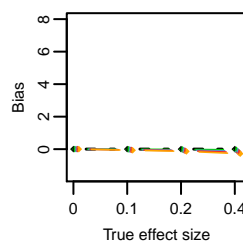
Bias pcor



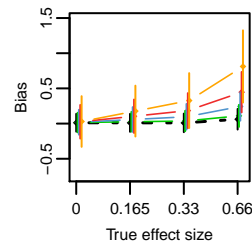
Bias lm phen ~ met



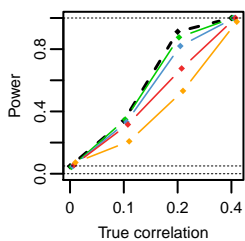
Bias lm met ~ phen



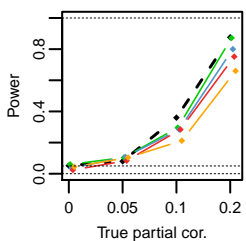
Bias logistic regr.



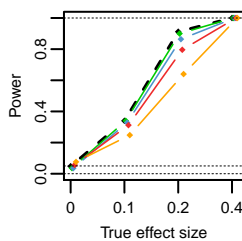
E Power cor



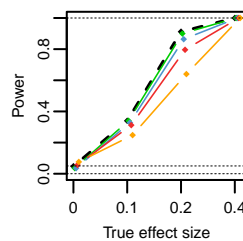
Power pcor



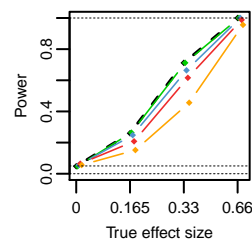
Power lm phen ~ met



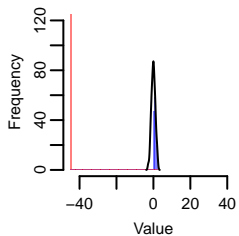
Power lm met ~ phen



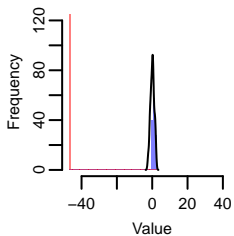
Power logistic regr.



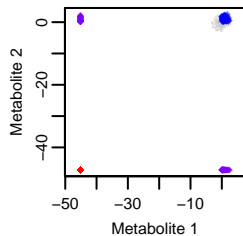
A Metabolite 1



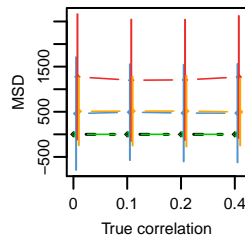
Metabolite 2



B Scatter plot



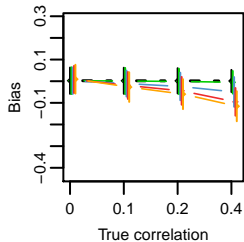
C MSD (observed, imputed)



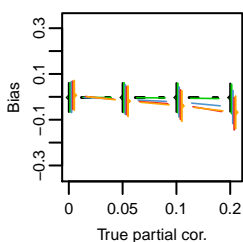
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 ● - 0 ● 0.1 ● 0.3 ● 0.5 ● 0.7

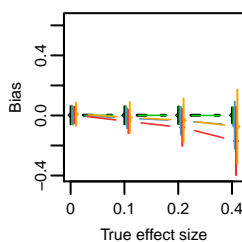
D Bias cor



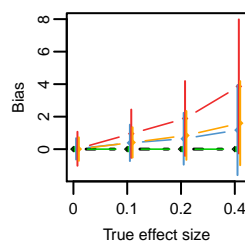
Bias pcor



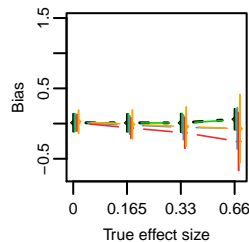
Bias lm phen ~ met



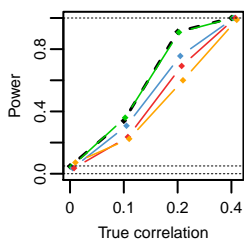
Bias lm met ~ phen



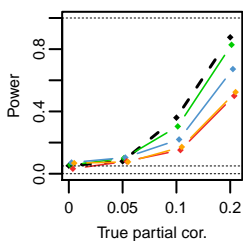
Bias logistic regr.



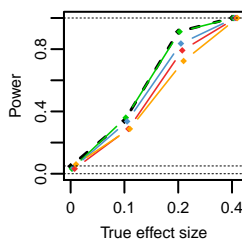
E Power cor



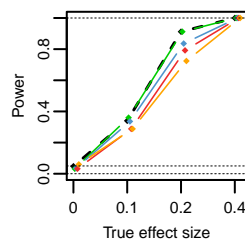
Power pcor



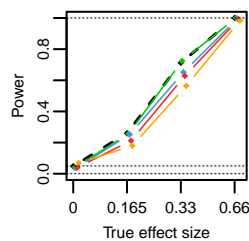
Power lm phen ~ met



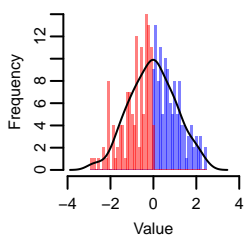
Power lm met ~ phen



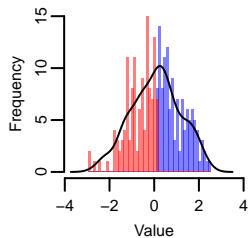
Power logistic regr.



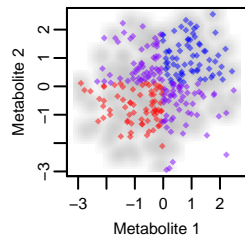
A Metabolite 1



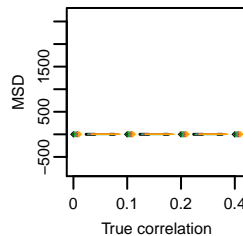
Metabolite 2



B Scatter plot



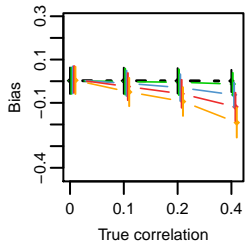
C MSD (observed, imputed)



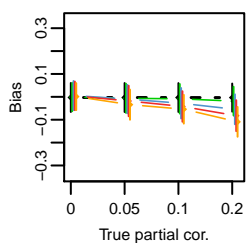
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 ● 0 ● 0.1 ● 0.3 ● 0.5 ● 0.7

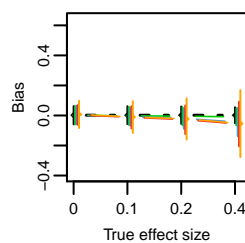
D Bias cor



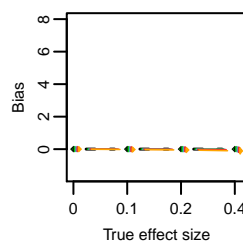
Bias pcor



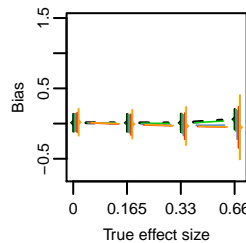
Bias lm phen ~ met



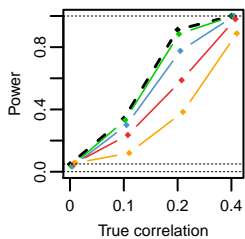
Bias lm met ~ phen



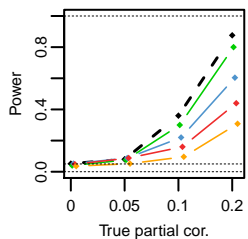
Bias logistic regr.



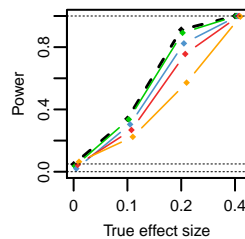
E Power cor



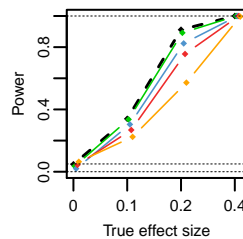
Power pcor



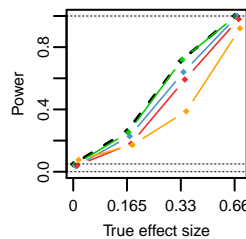
Power lm phen ~ met



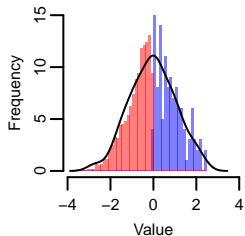
Power lm met ~ phen



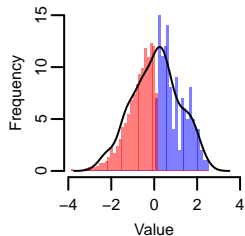
Power logistic regr.



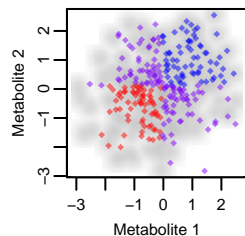
A Metabolite 1



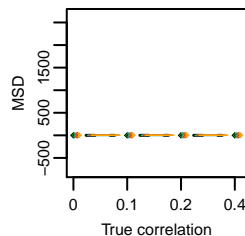
Metabolite 2



B Scatter plot



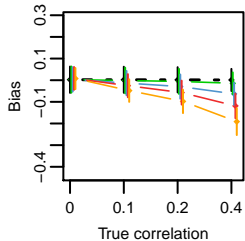
C MSD (observed, imputed)



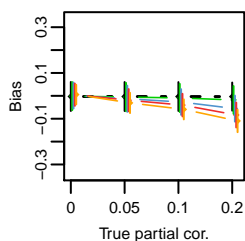
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 ● 0 ● 0.1 ● 0.3 ● 0.5 ● 0.7

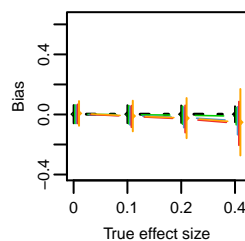
D Bias cor



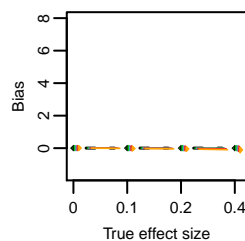
Bias pcor



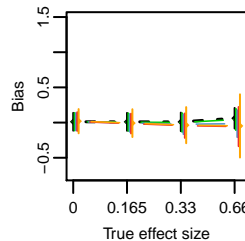
Bias lm phen ~ met



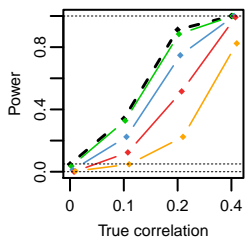
Bias lm met ~ phen



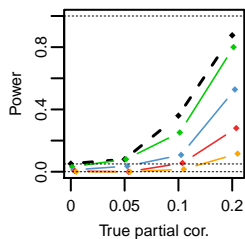
Bias logistic regr.



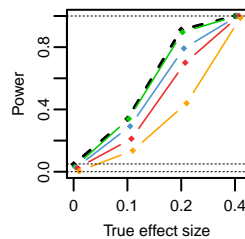
E Power cor



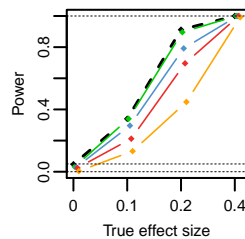
Power pcor



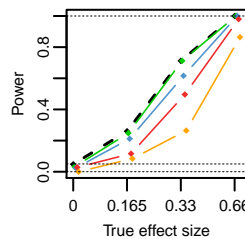
Power lm phen ~ met

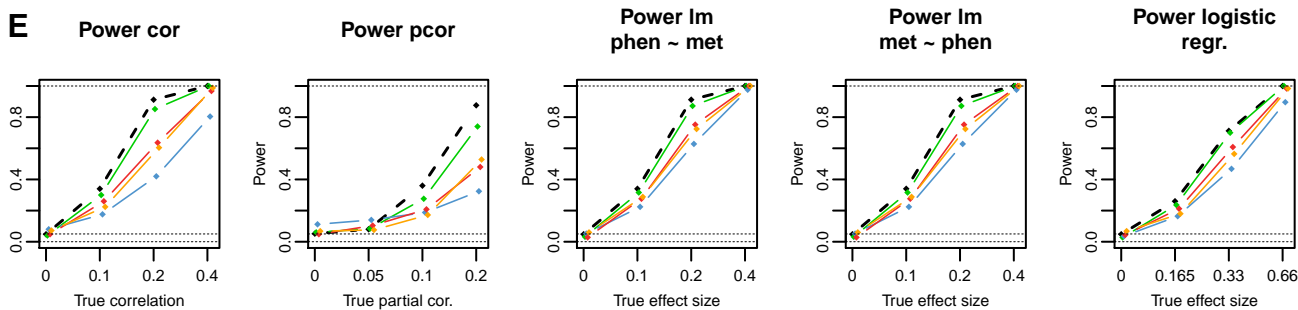
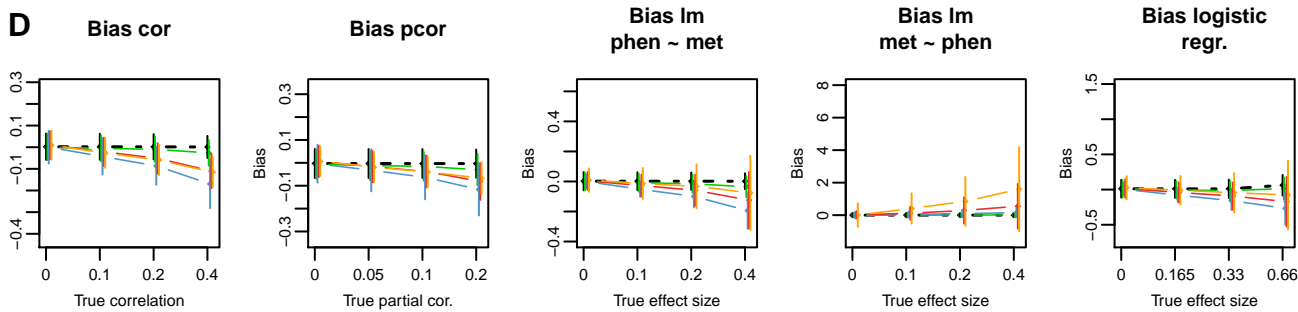
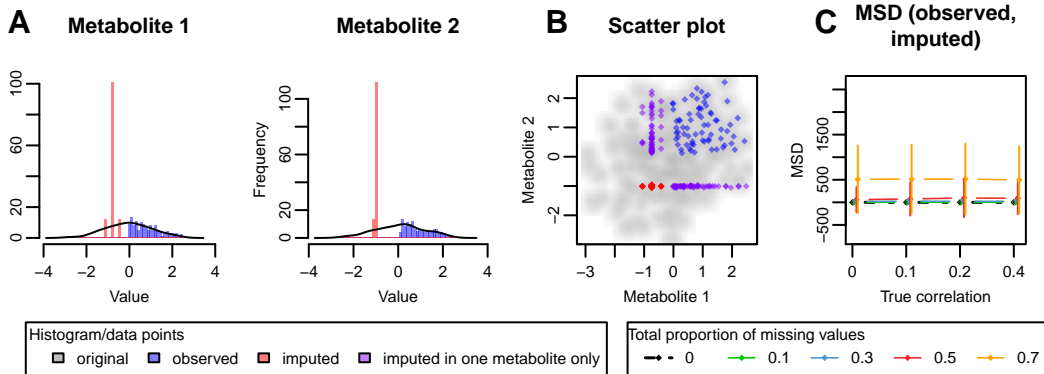


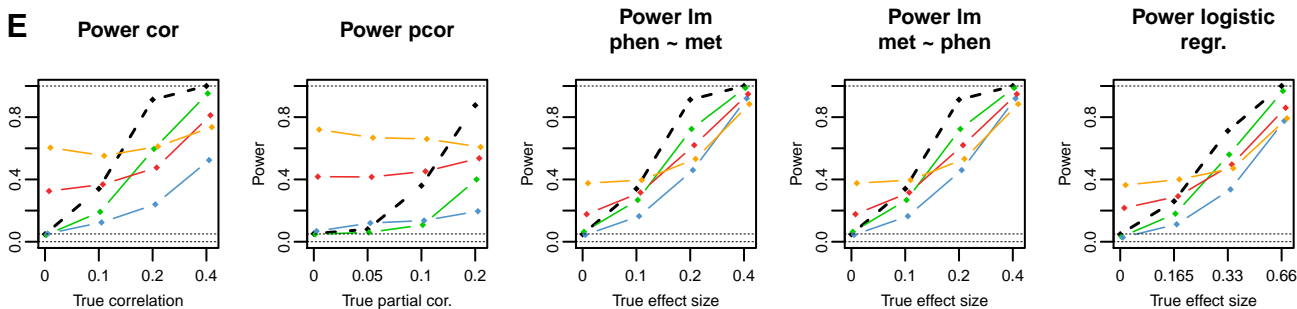
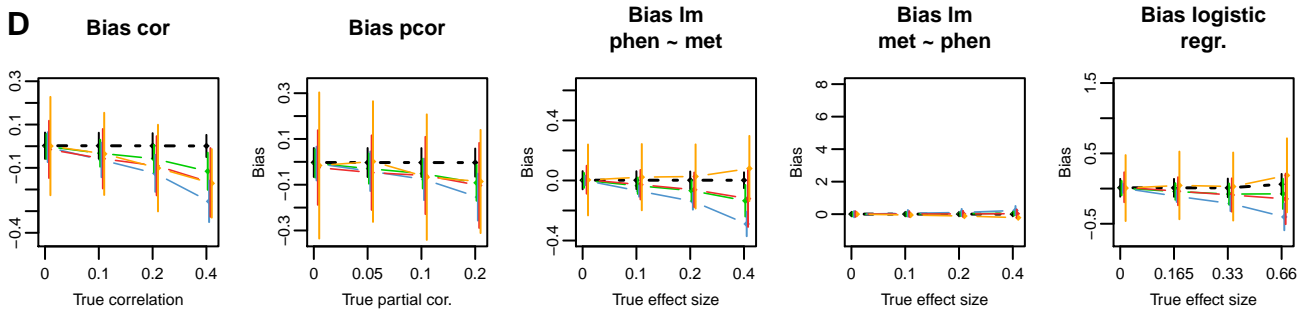
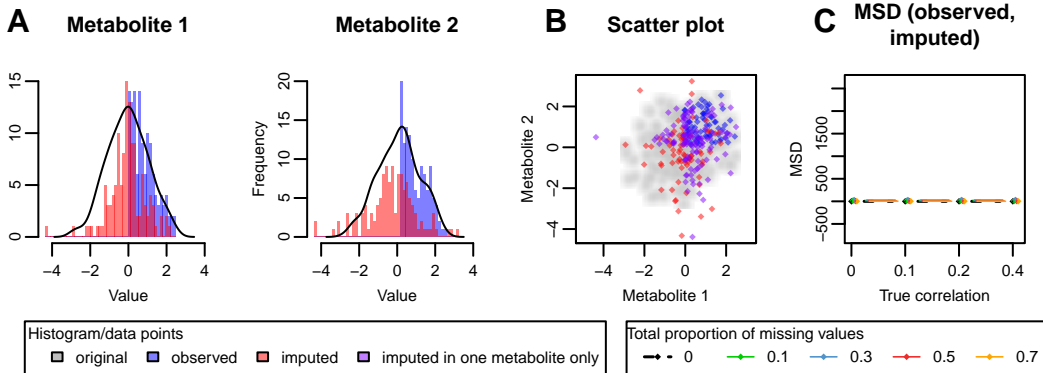
Power lm met ~ phen



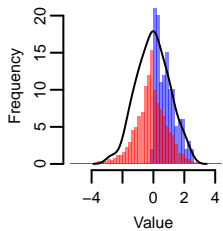
Power logistic regr.



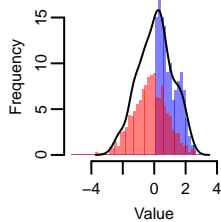




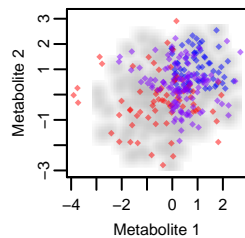
A Metabolite 1



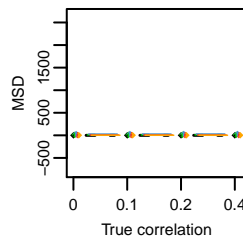
Metabolite 2



B Scatter plot



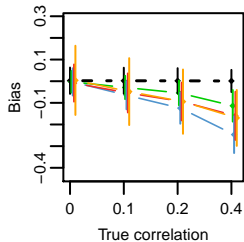
C MSD (observed, imputed)



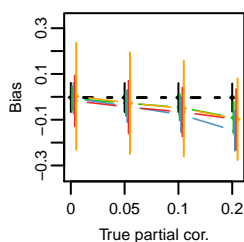
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 ● - 0 ● 0.1 ● 0.3 ● 0.5 ● 0.7

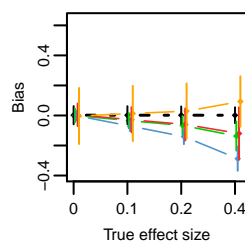
D Bias cor



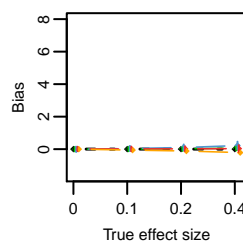
Bias pcor



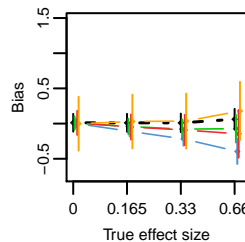
Bias lm phen ~ met



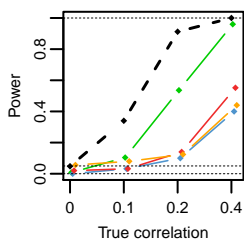
Bias lm met ~ phen



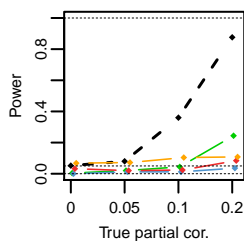
Bias logistic regr.



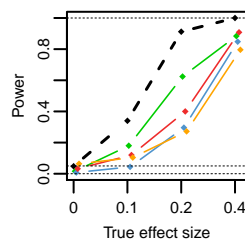
E Power cor



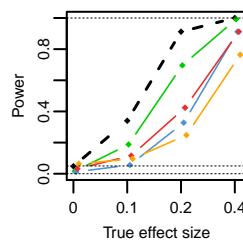
Power pcor



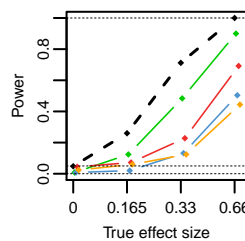
Power lm phen ~ met

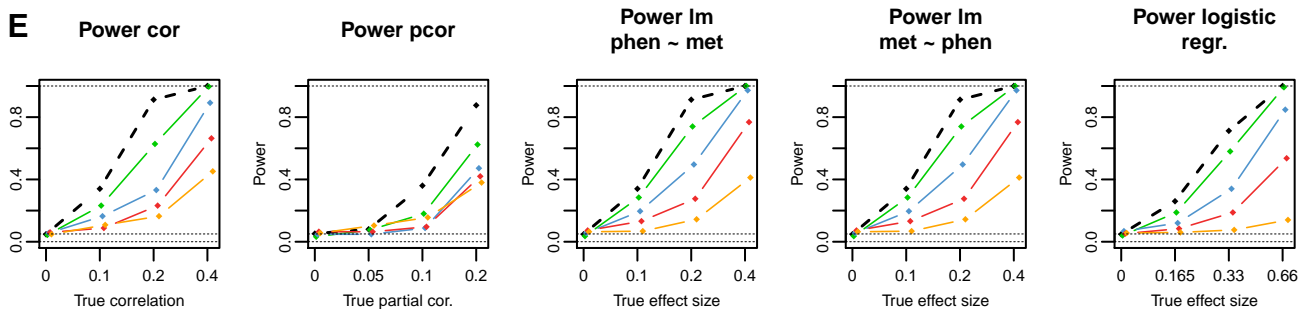
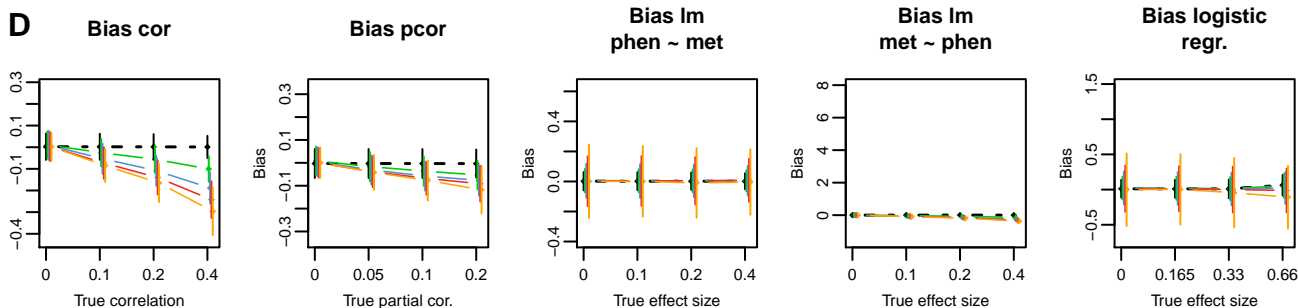
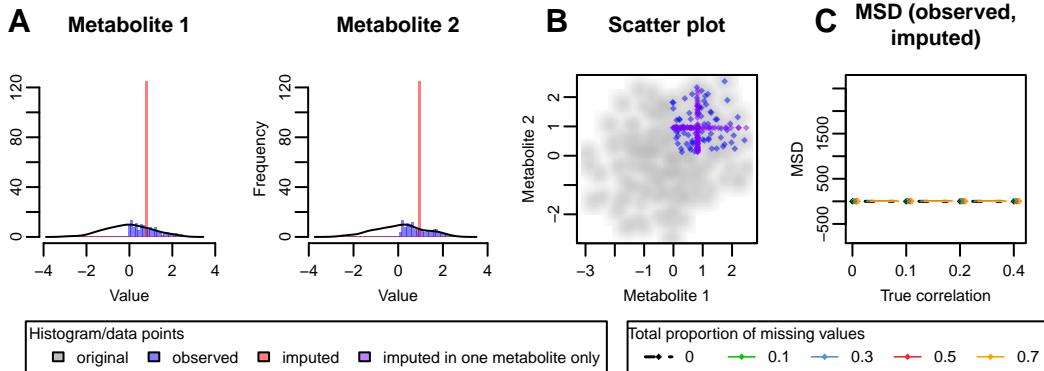


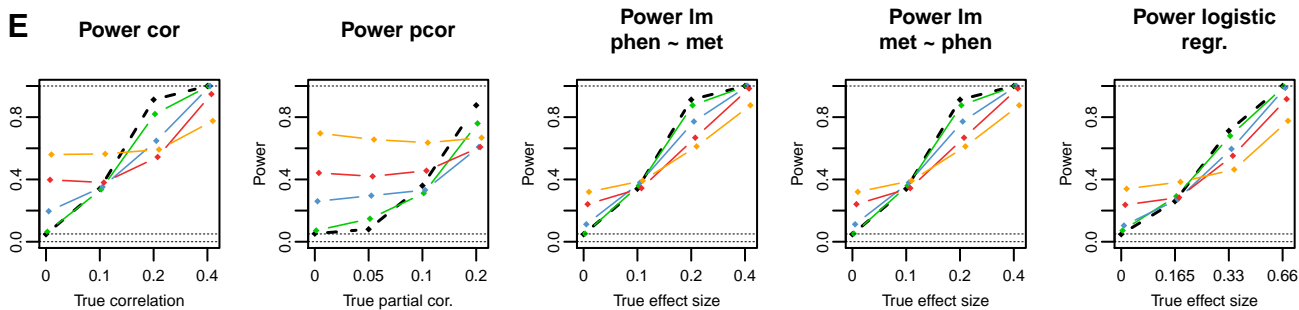
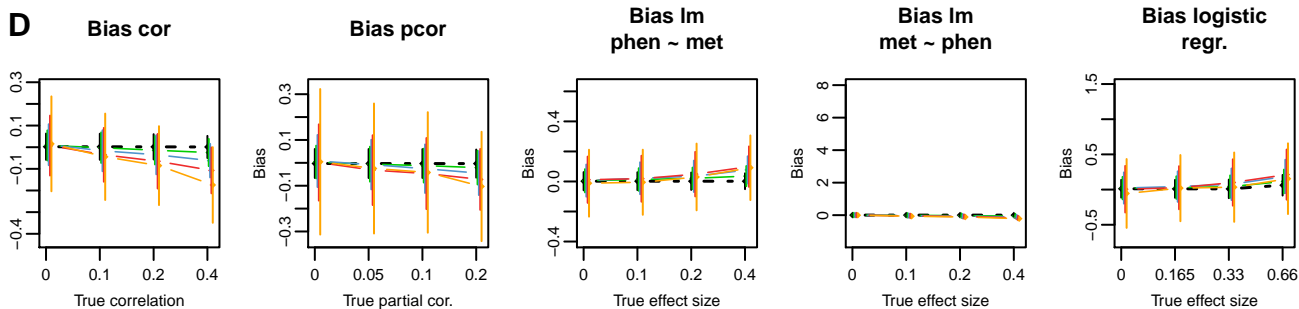
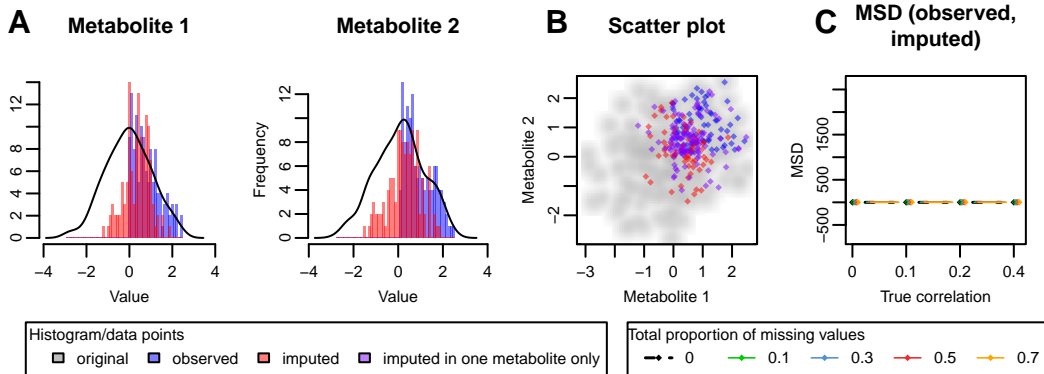
Power lm met ~ phen

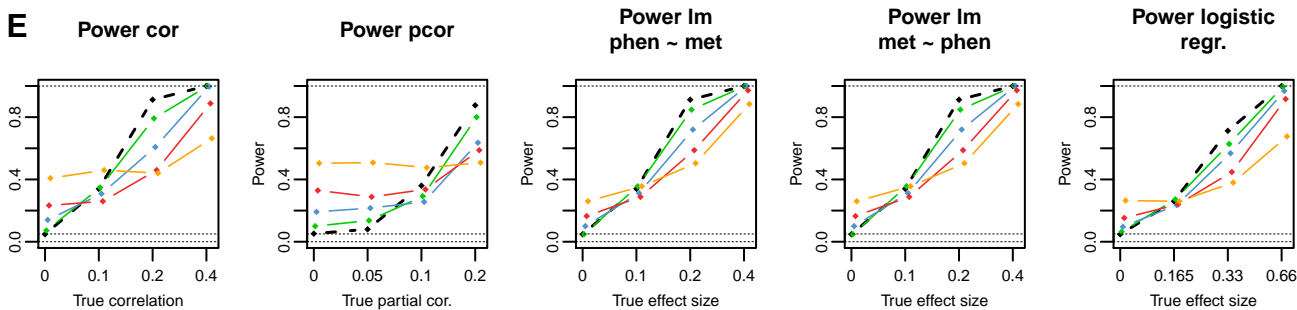
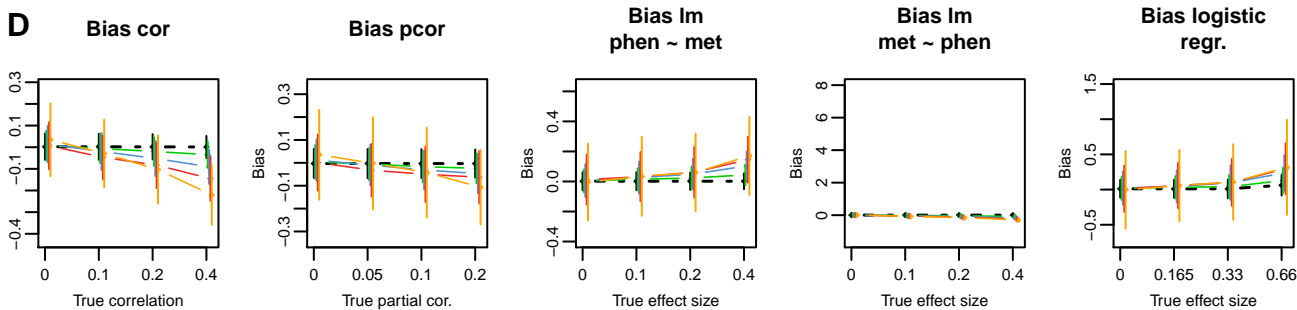
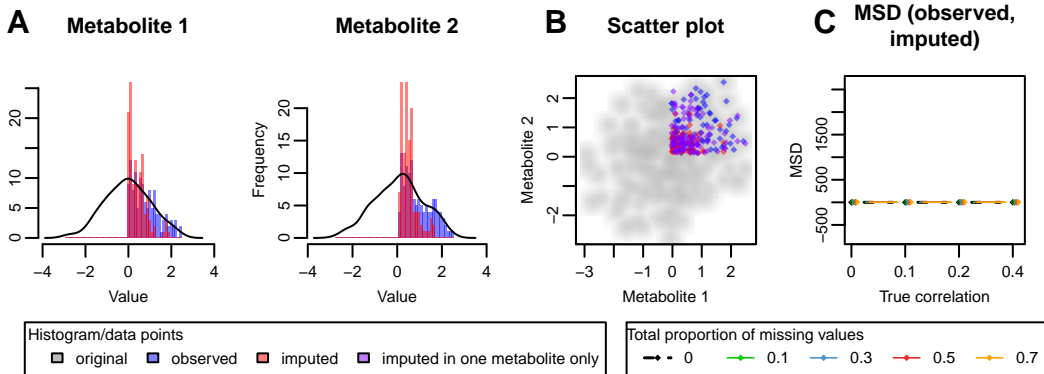


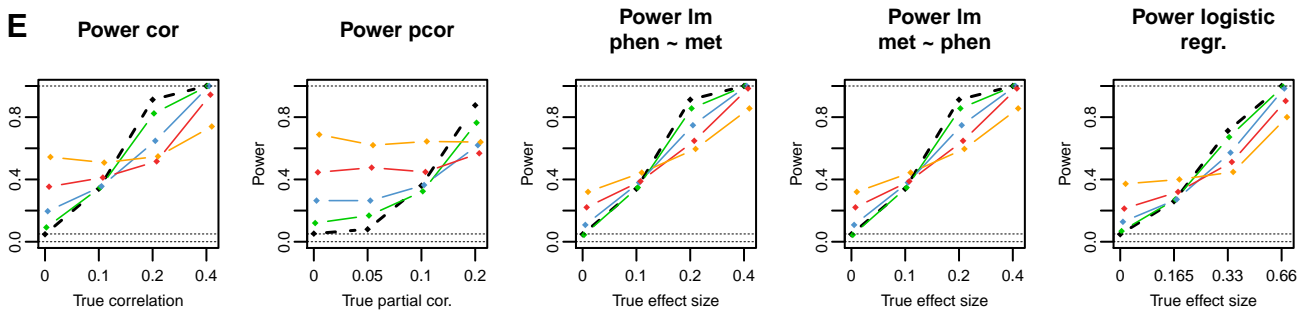
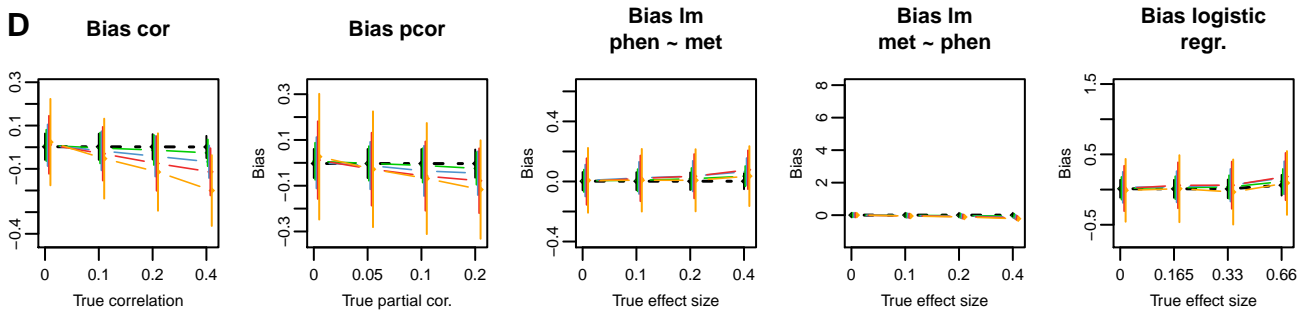
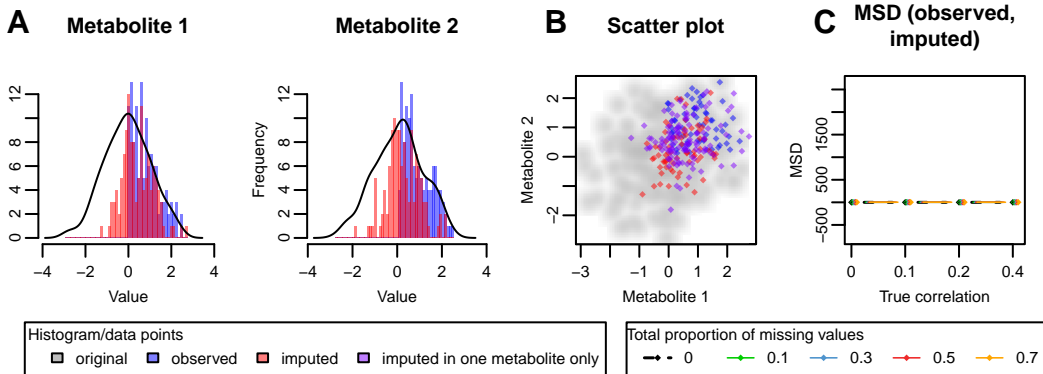
Power logistic regr.

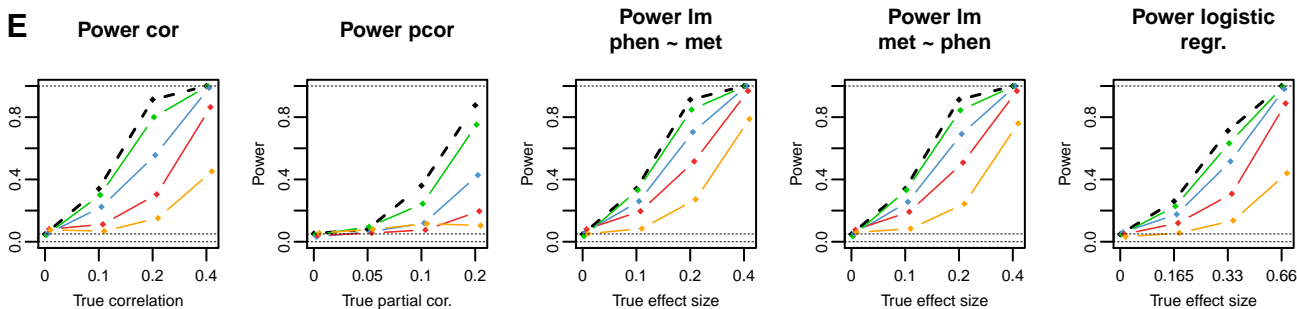
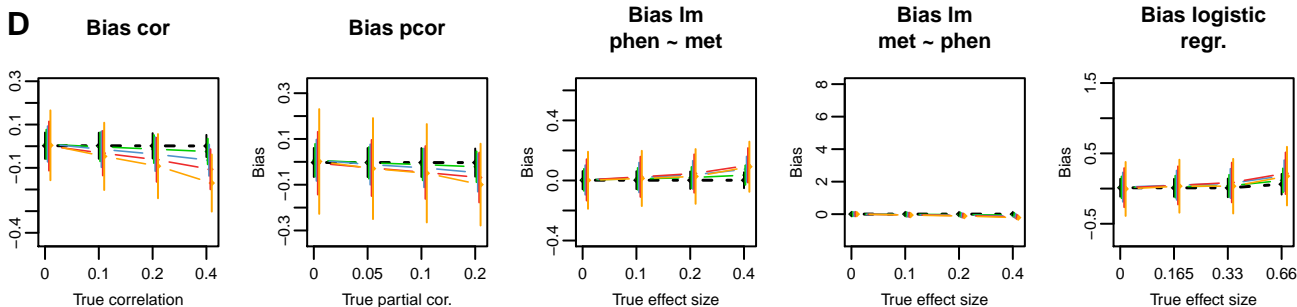
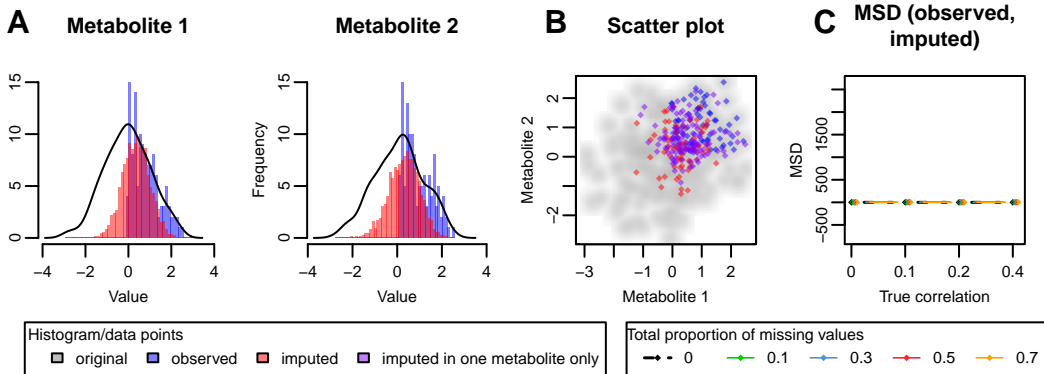


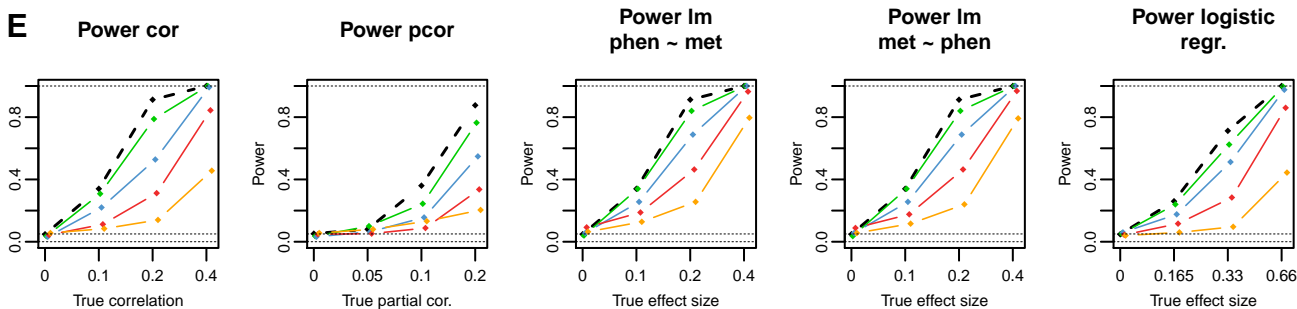
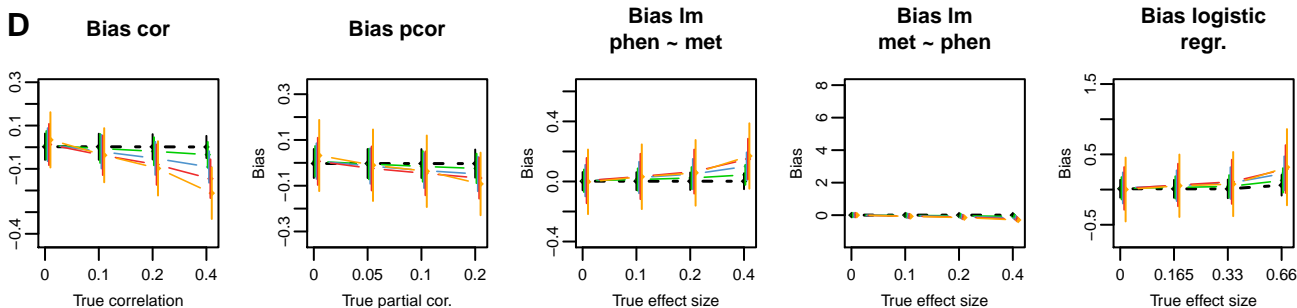
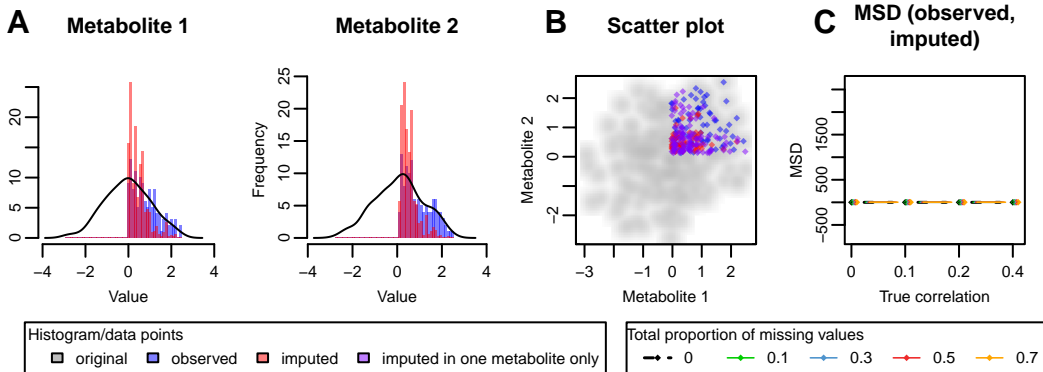


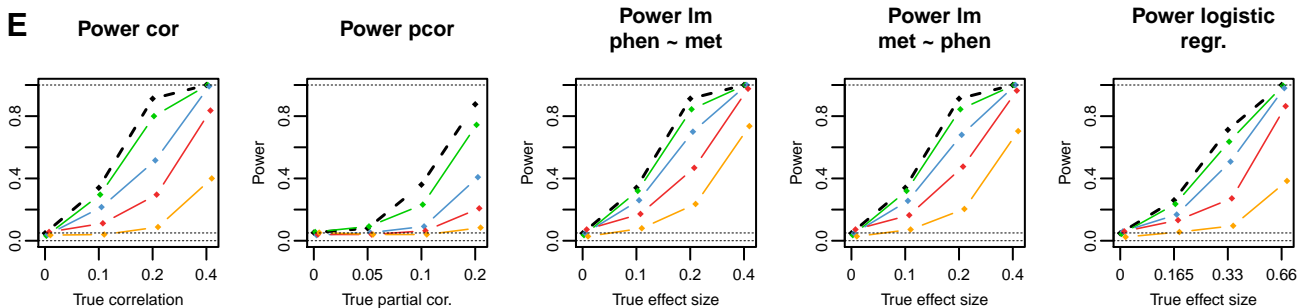
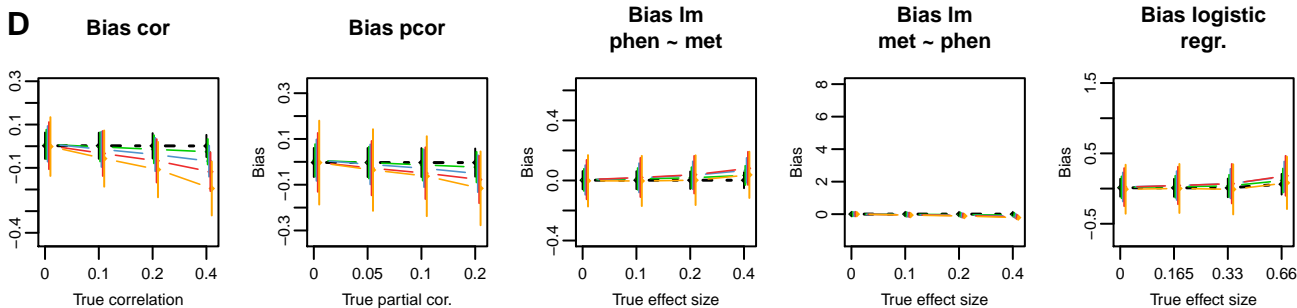
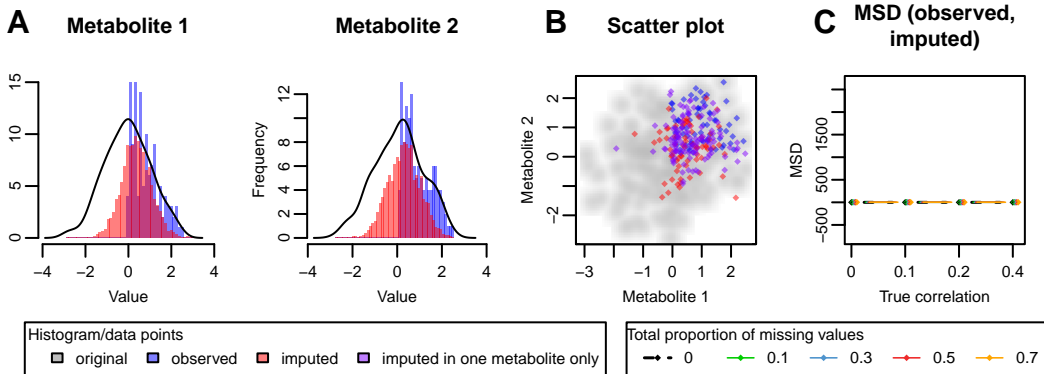




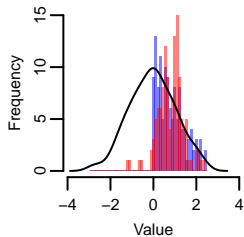




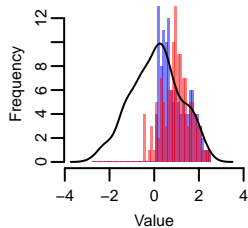




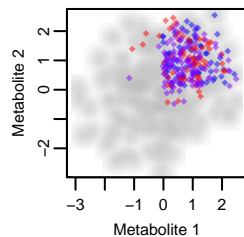
A Metabolite 1



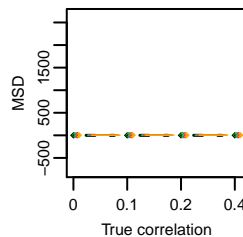
Metabolite 2



B Scatter plot



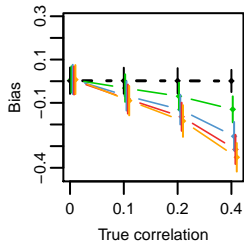
C MSD (observed, imputed)



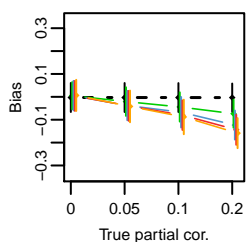
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 ● - 0 ● 0.1 ● 0.3 ● 0.5 ● 0.7

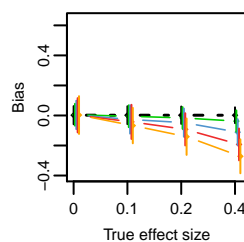
D Bias cor



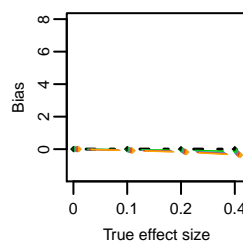
Bias pcor



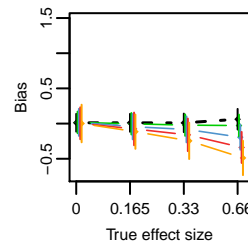
Bias lm phen ~ met



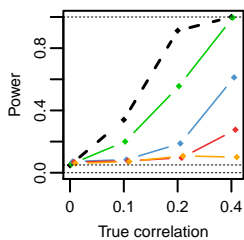
Bias lm met ~ phen



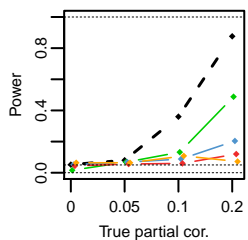
Bias logistic regr.



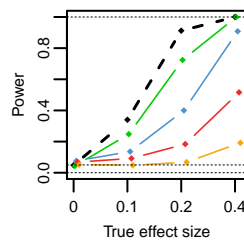
E Power cor



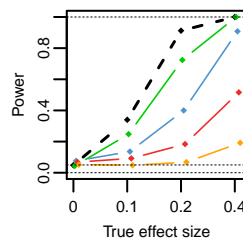
Power pcor



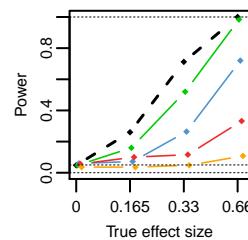
Power lm phen ~ met



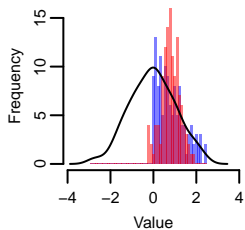
Power lm met ~ phen



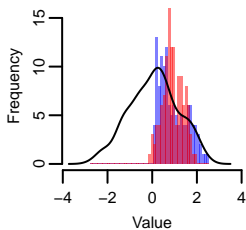
Power logistic regr.



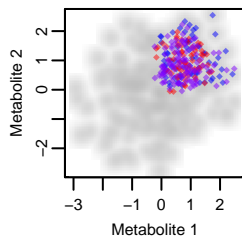
A Metabolite 1



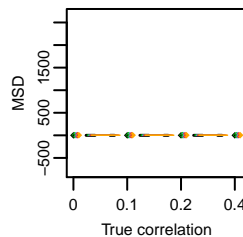
Metabolite 2



B Scatter plot



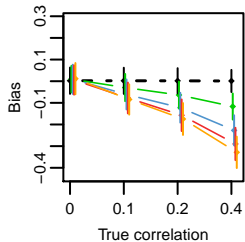
C MSD (observed, imputed)



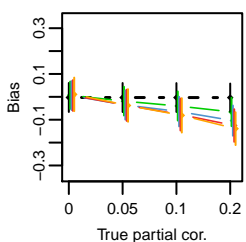
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 ● 0 ● 0.1 ● 0.3 ● 0.5 ● 0.7

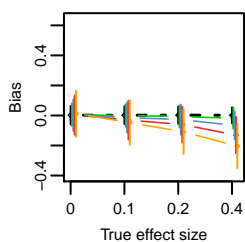
D Bias cor



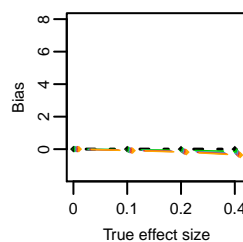
Bias pcor



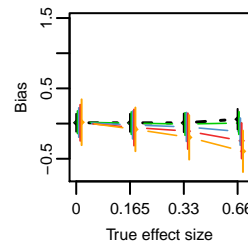
Bias lm phen ~ met



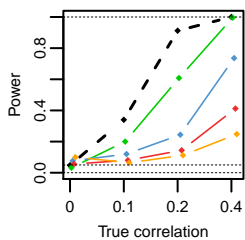
Bias lm met ~ phen



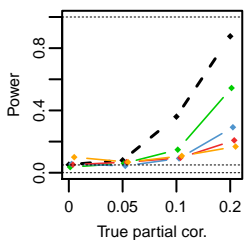
Bias logistic regr.



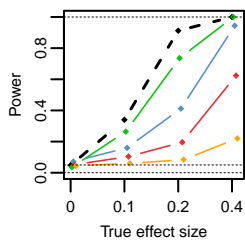
E Power cor



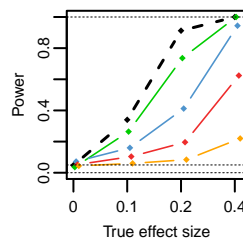
Power pcor



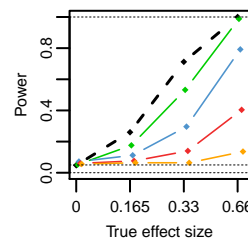
Power lm phen ~ met



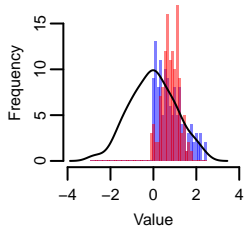
Power lm met ~ phen



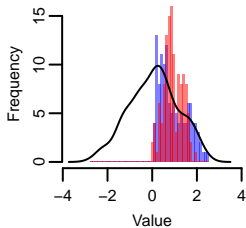
Power logistic regr.



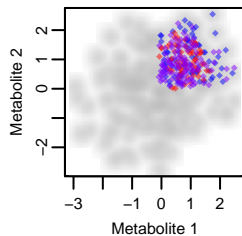
A Metabolite 1



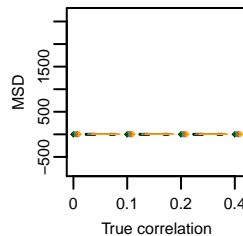
Metabolite 2



B Scatter plot



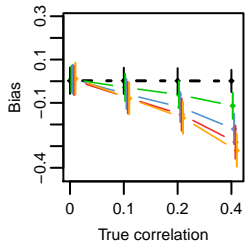
C MSD (observed, imputed)



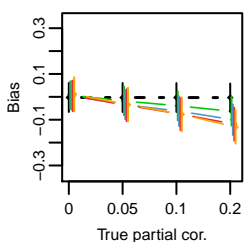
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 ● 0 ● 0.1 ● 0.3 ● 0.5 ● 0.7

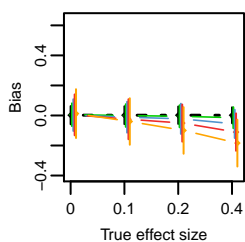
D Bias cor



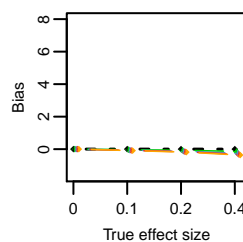
Bias pcor



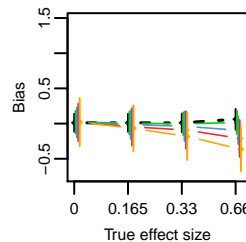
Bias lm phen ~ met



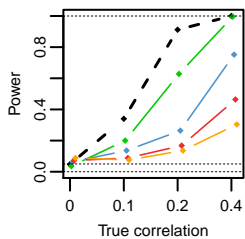
Bias lm met ~ phen



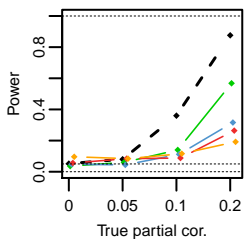
Bias logistic regr.



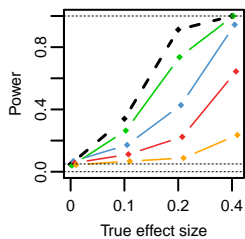
E Power cor



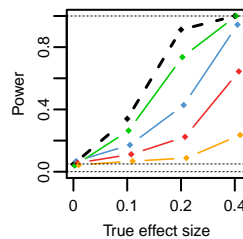
Power pcor



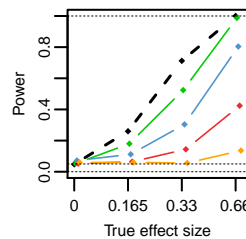
Power lm phen ~ met

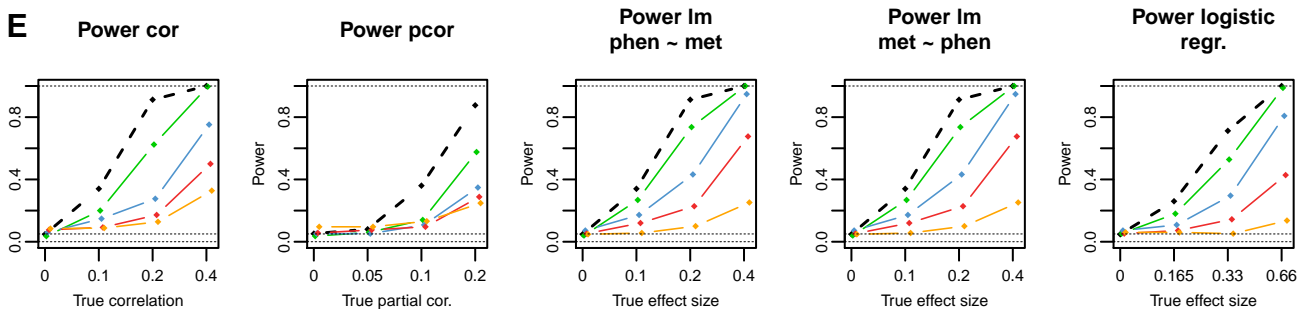
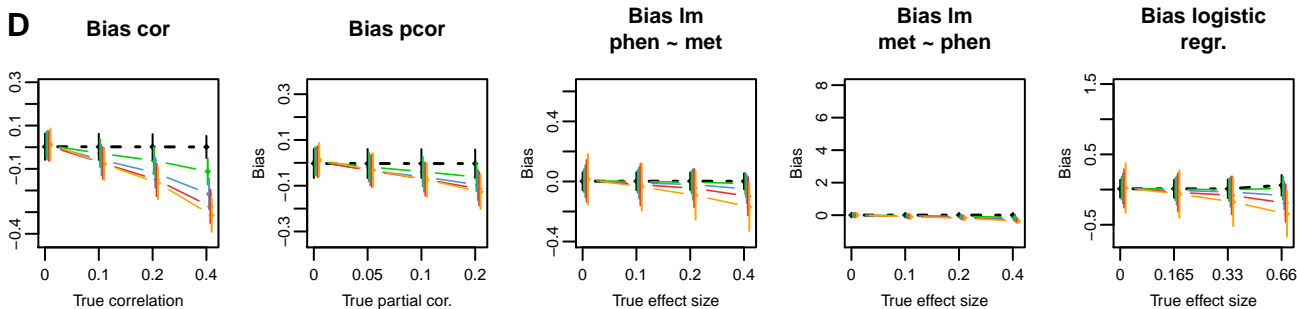
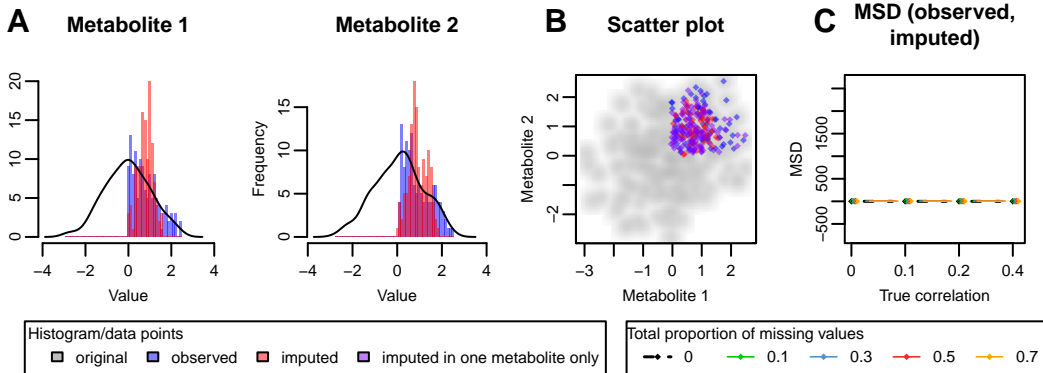


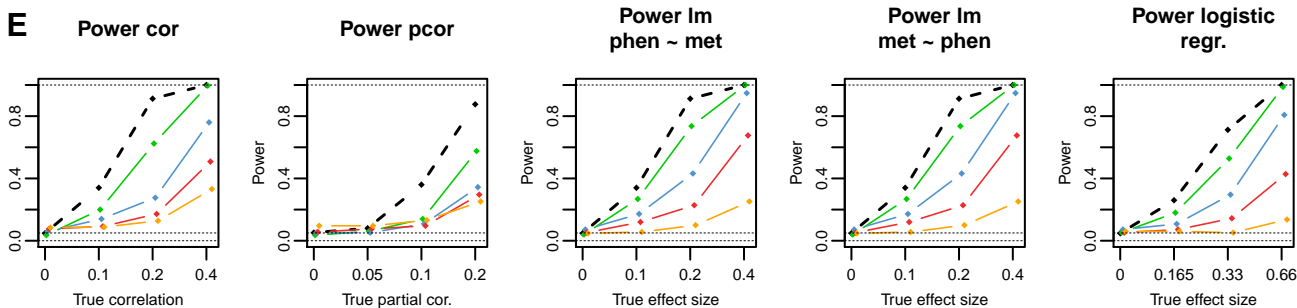
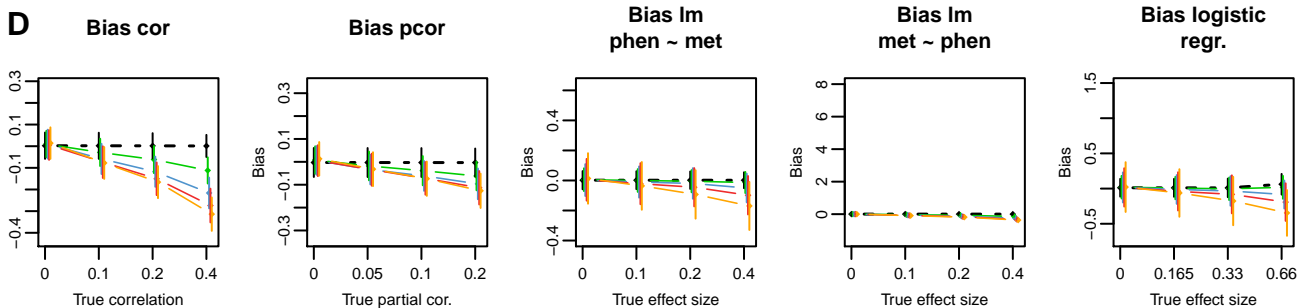
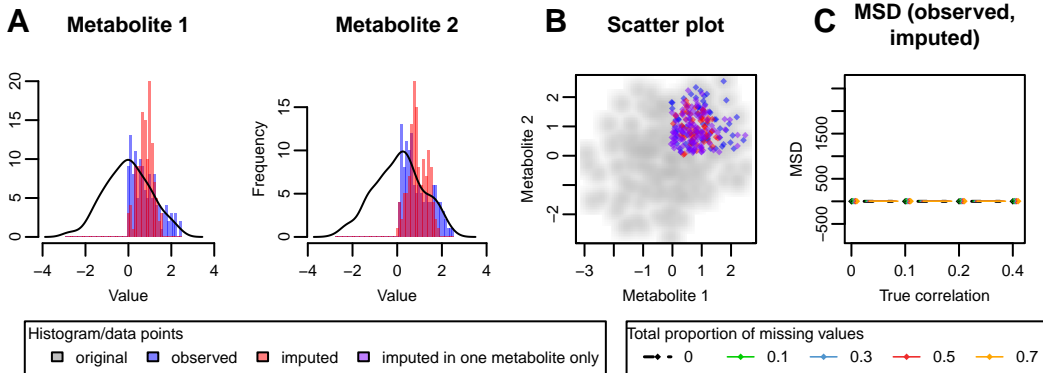
Power lm met ~ phen

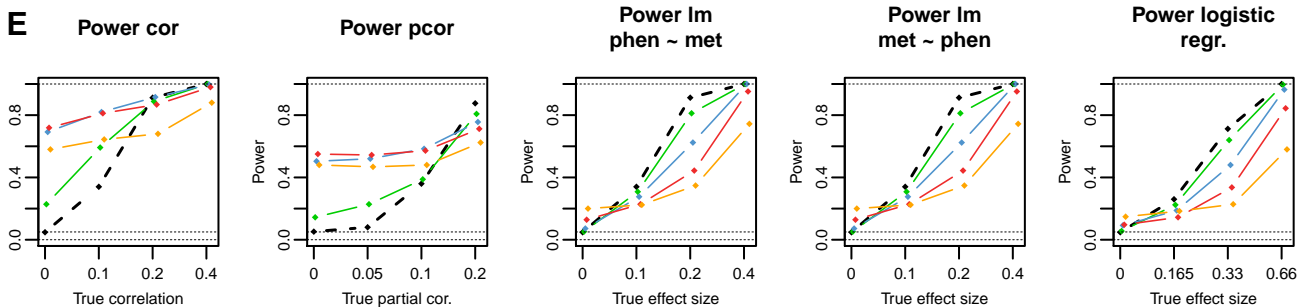
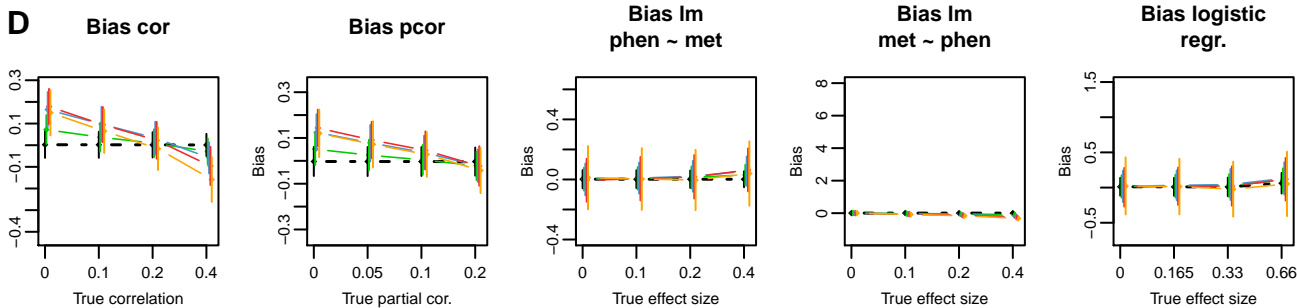
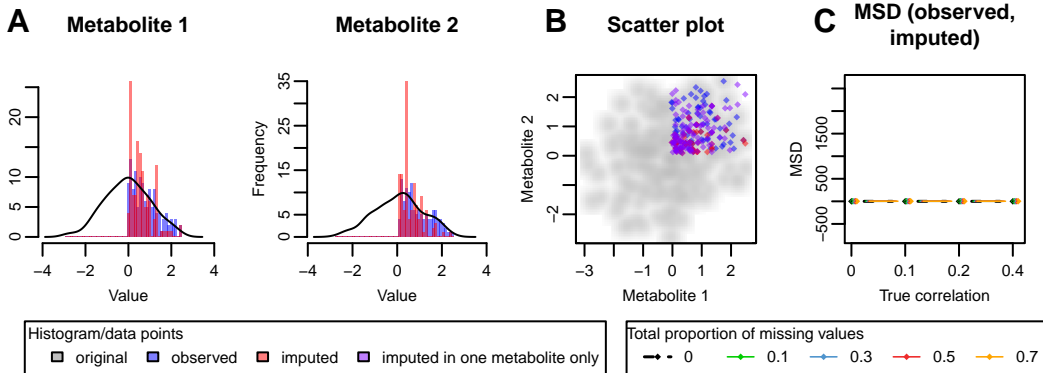


Power logistic regr.

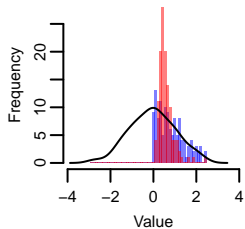




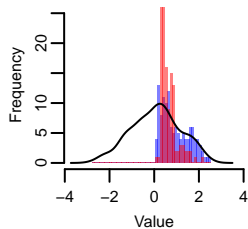




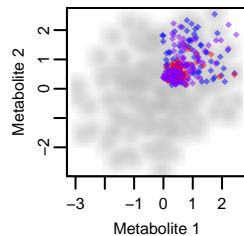
A Metabolite 1



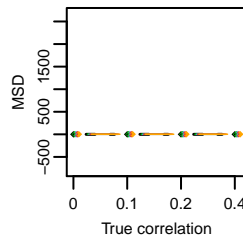
Metabolite 2



B Scatter plot



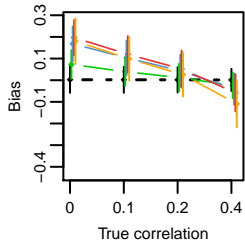
C MSD (observed, imputed)



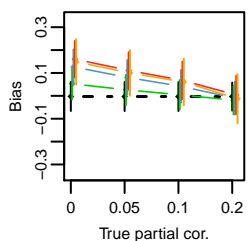
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 ● - 0 ● 0.1 ● 0.3 ● 0.5 ● 0.7

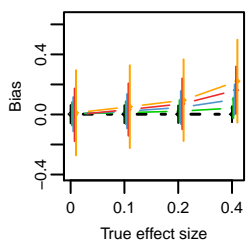
D Bias cor



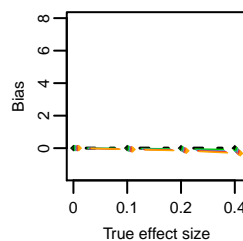
Bias pcor



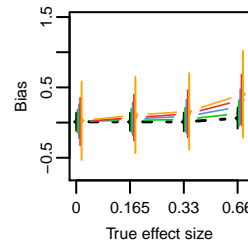
Bias lm phen ~ met



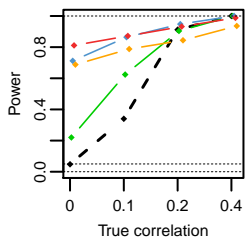
Bias lm met ~ phen



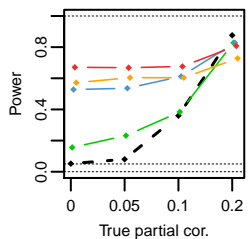
Bias logistic regr.



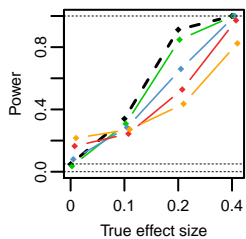
E Power cor



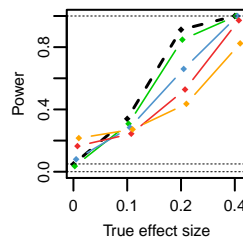
Power pcor



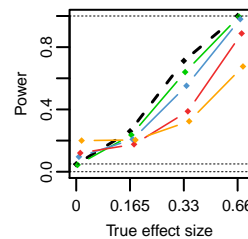
Power lm phen ~ met

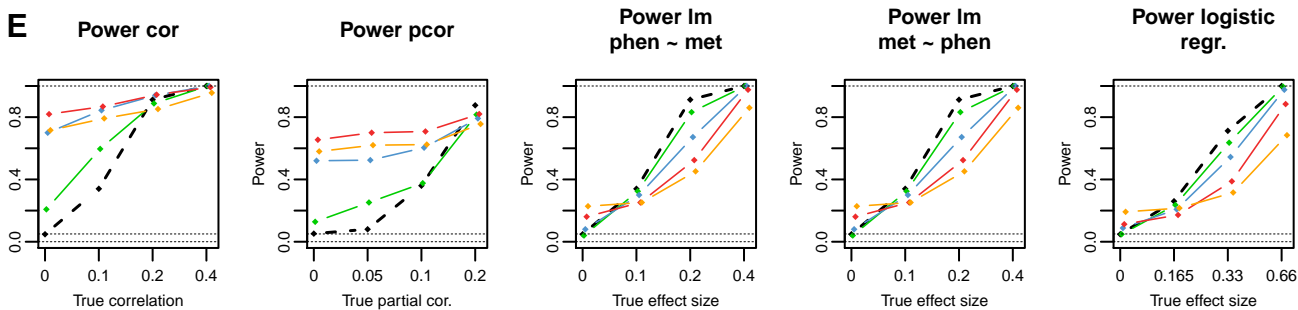
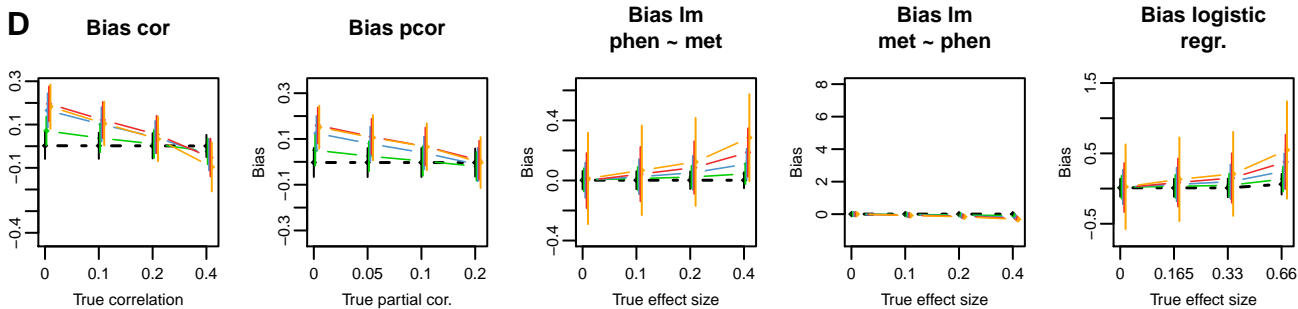
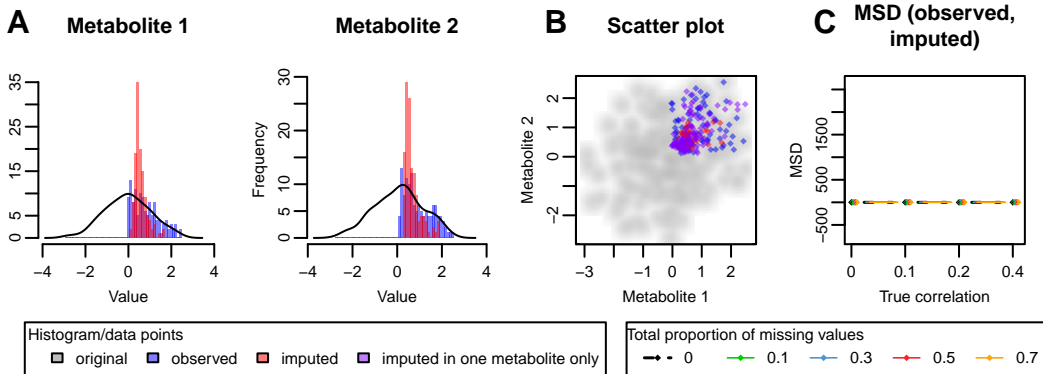


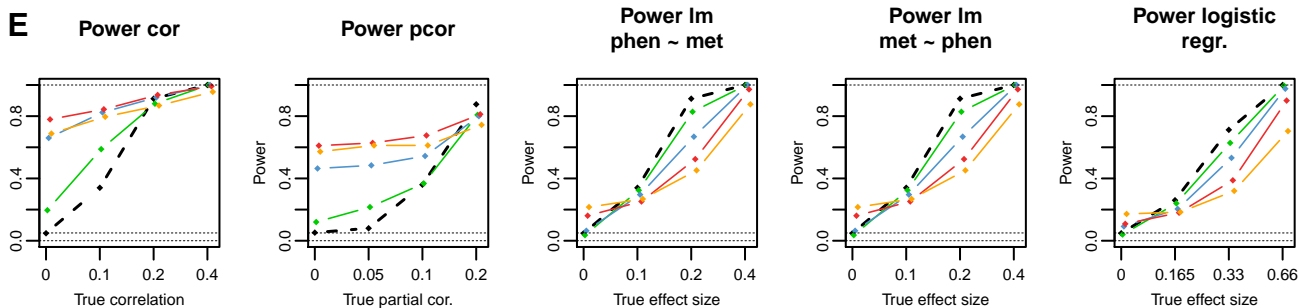
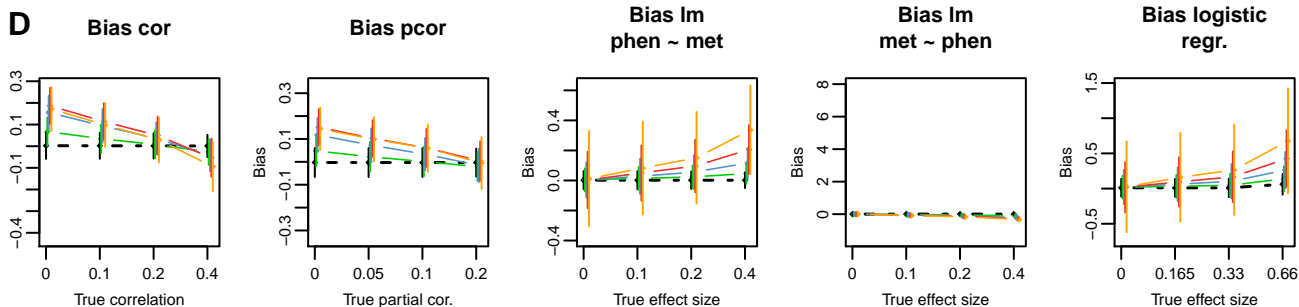
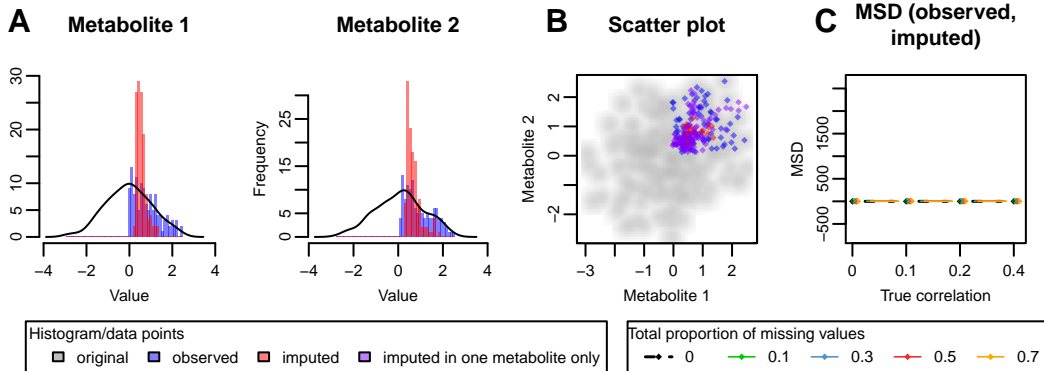
Power lm met ~ phen

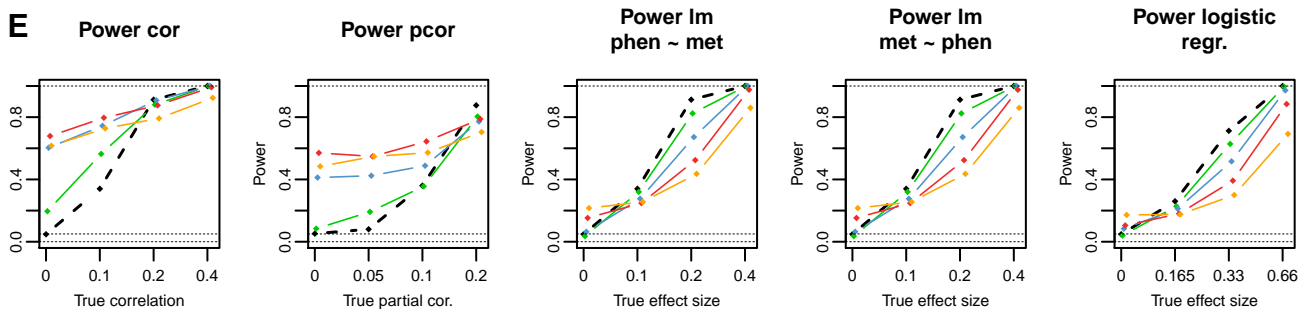
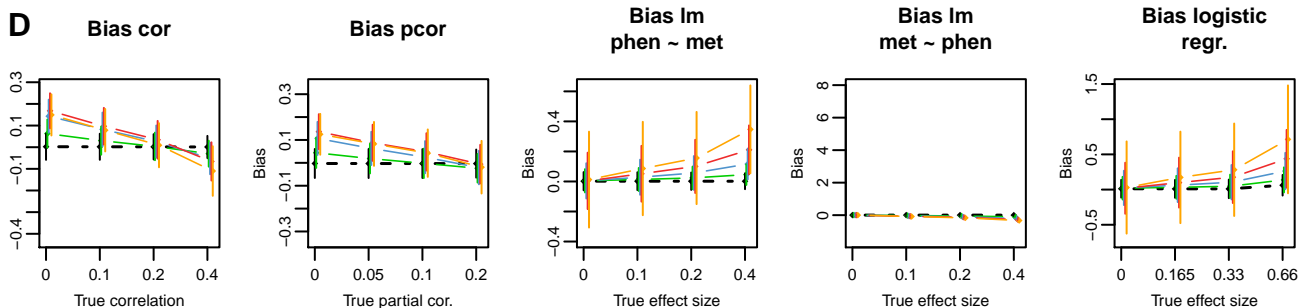
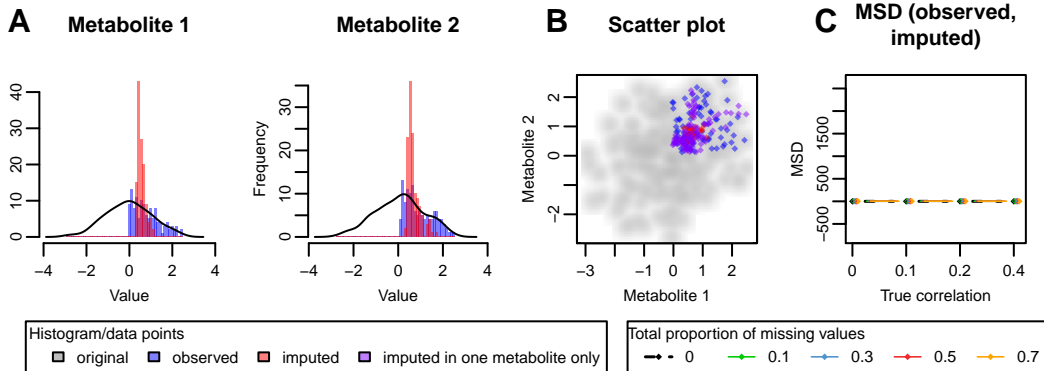


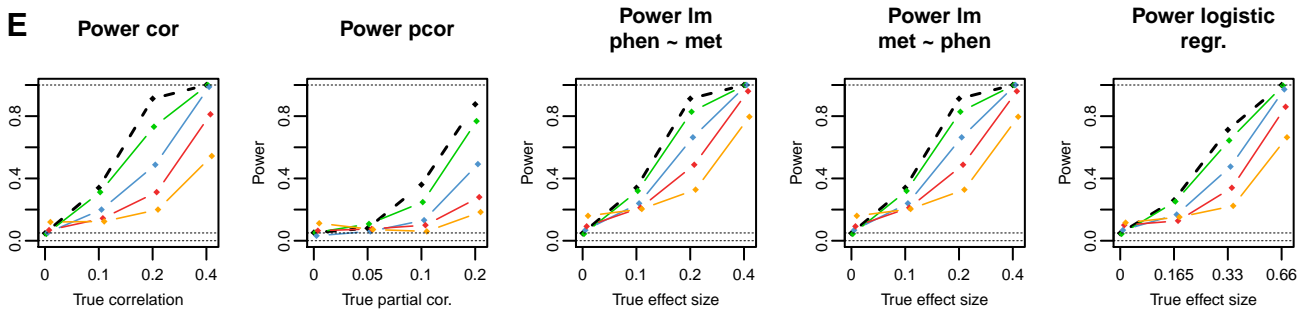
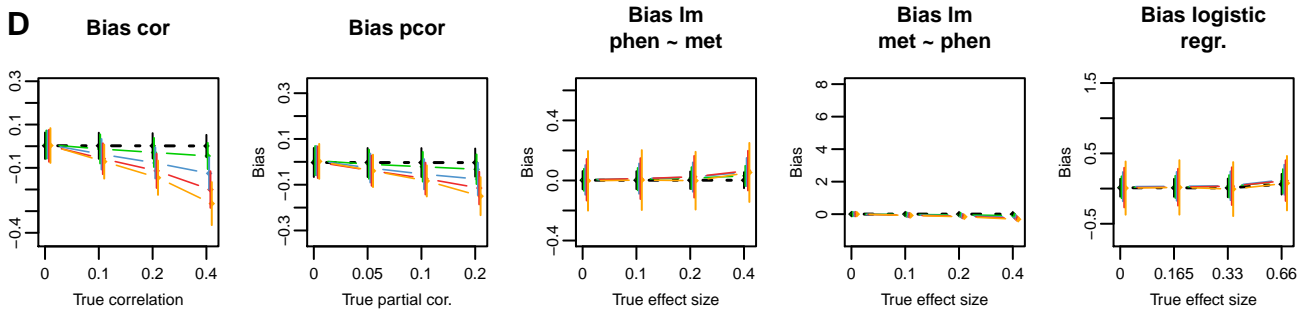
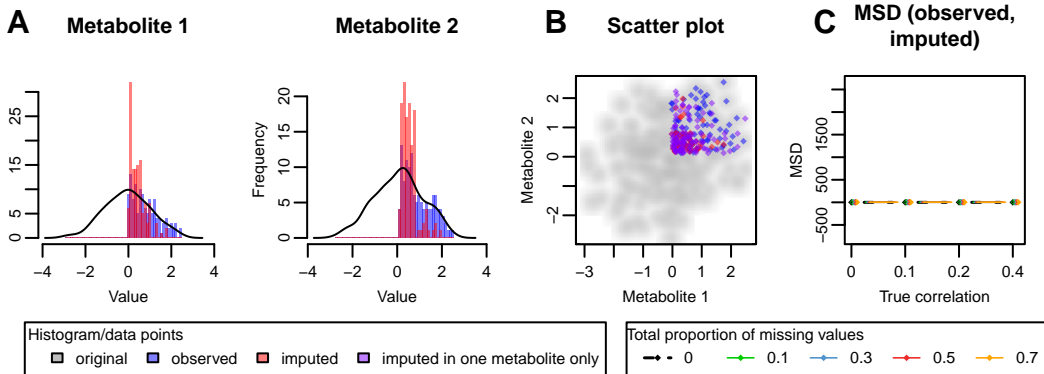
Power logistic regr.

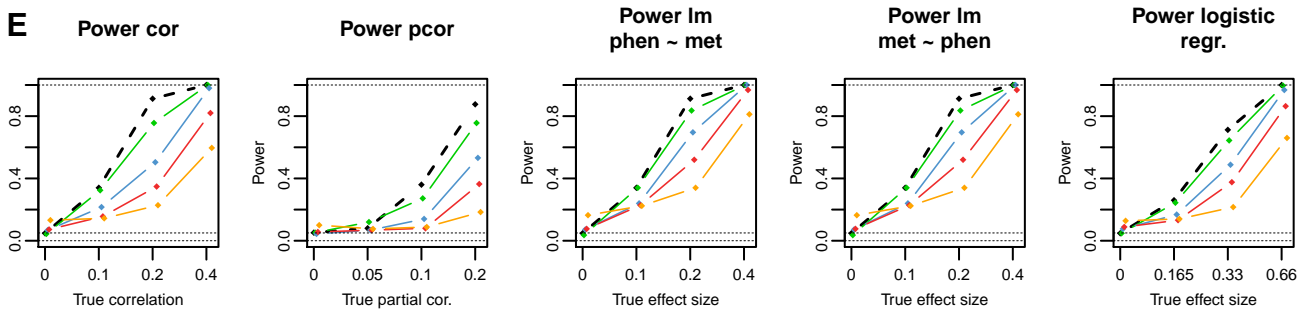
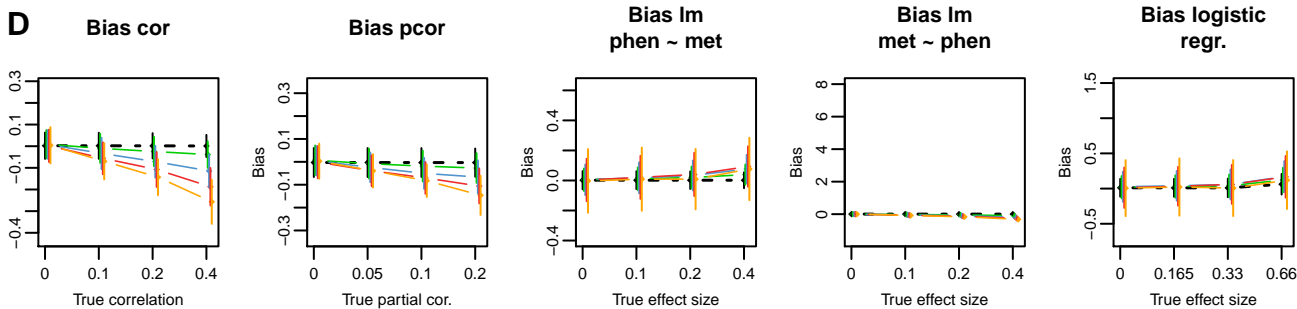
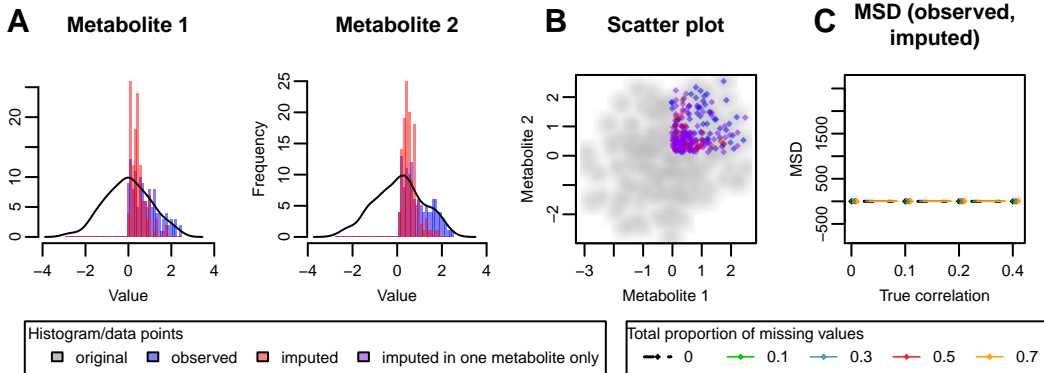


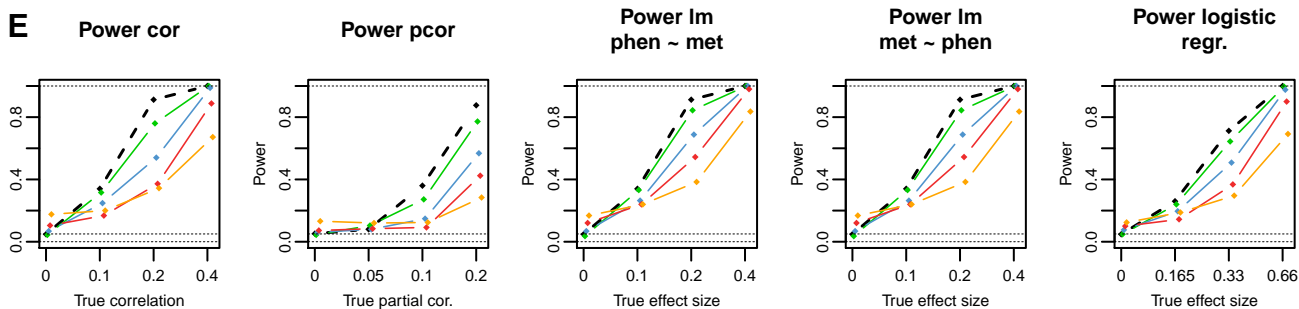
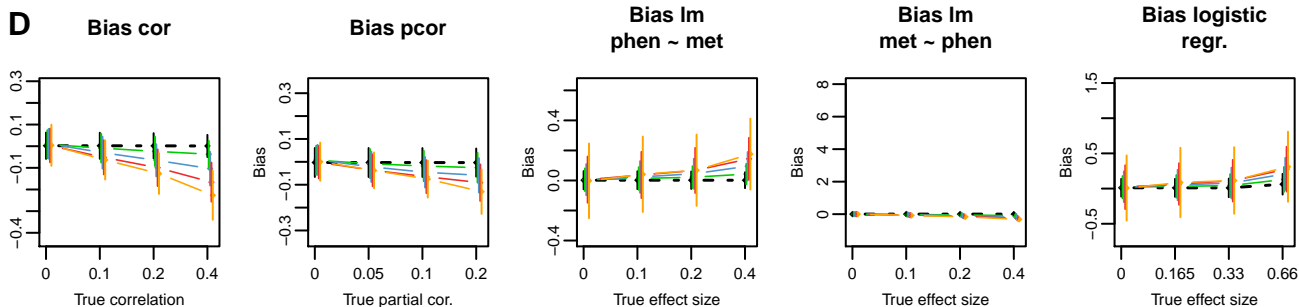
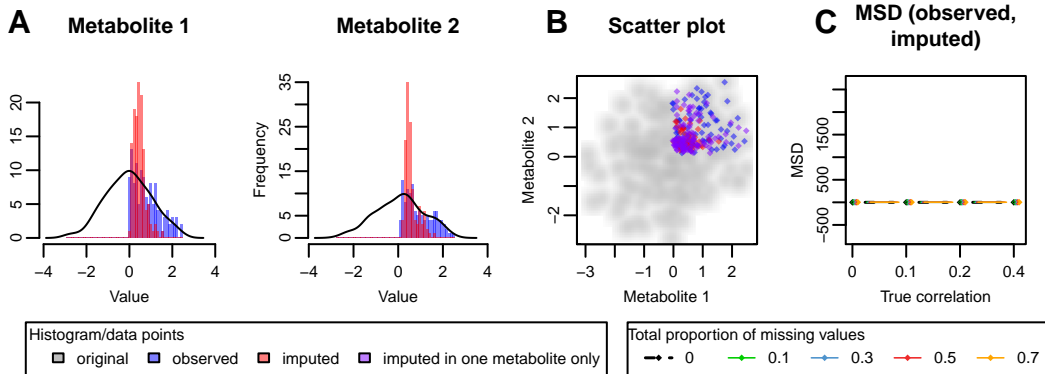


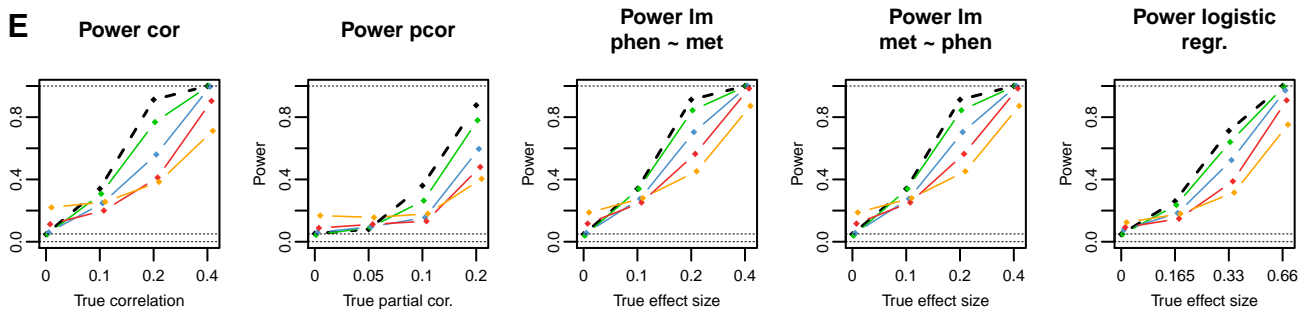
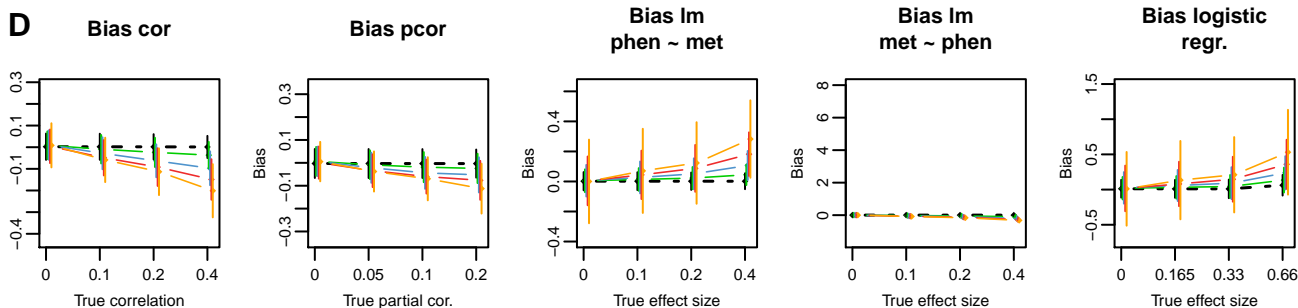
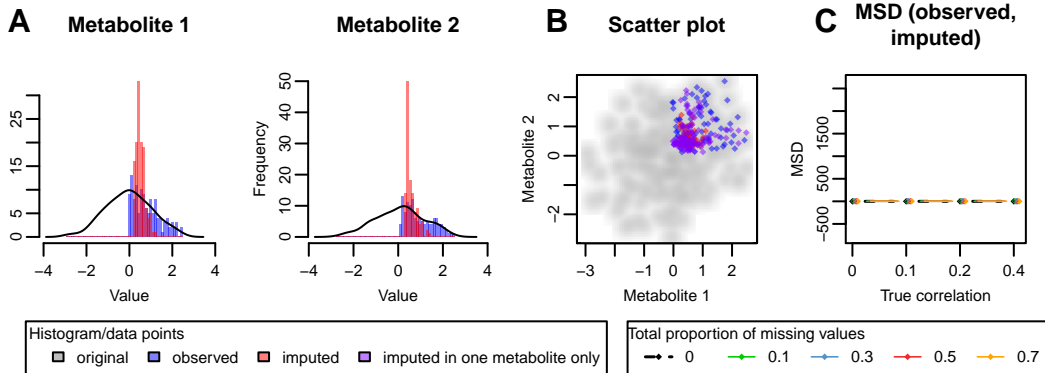


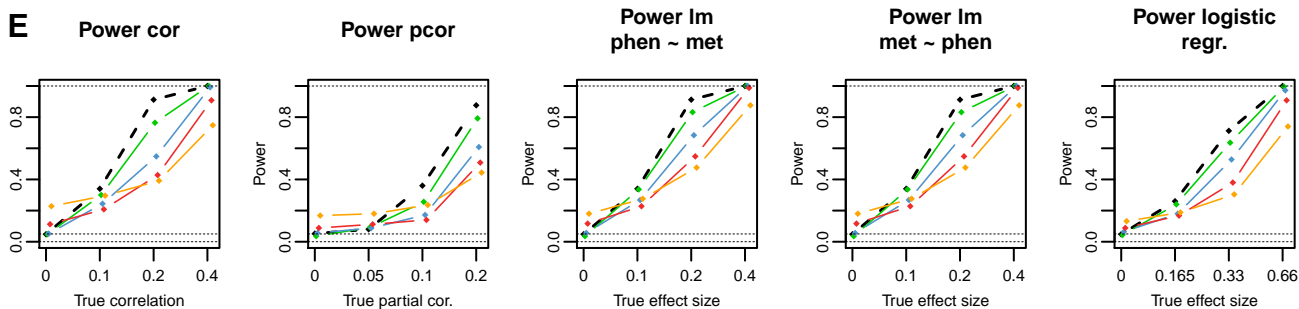
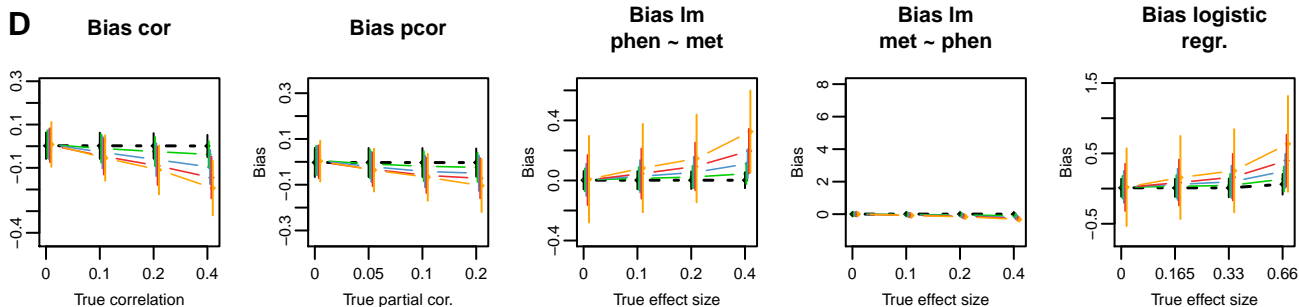
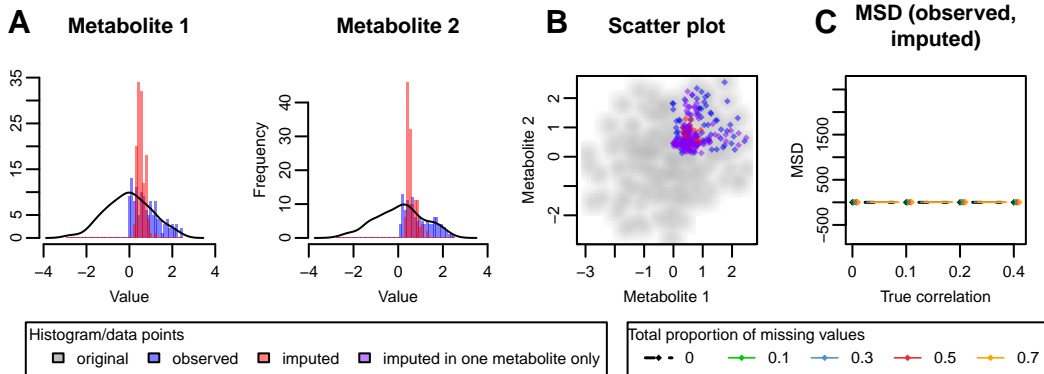


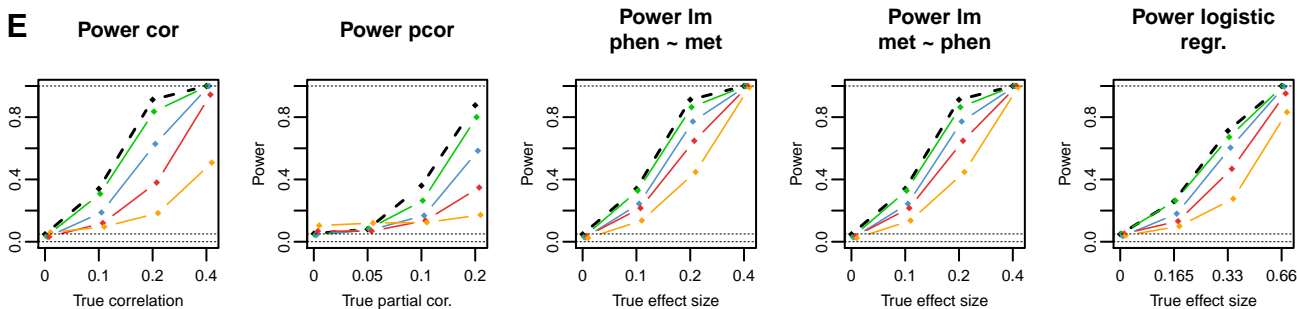
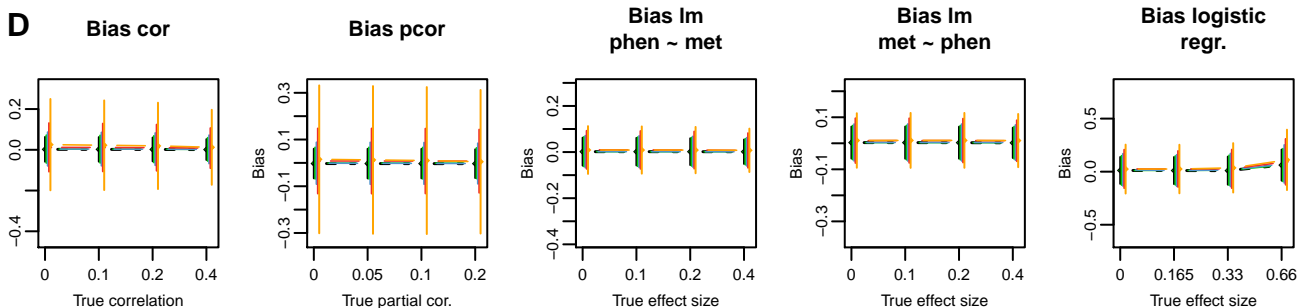
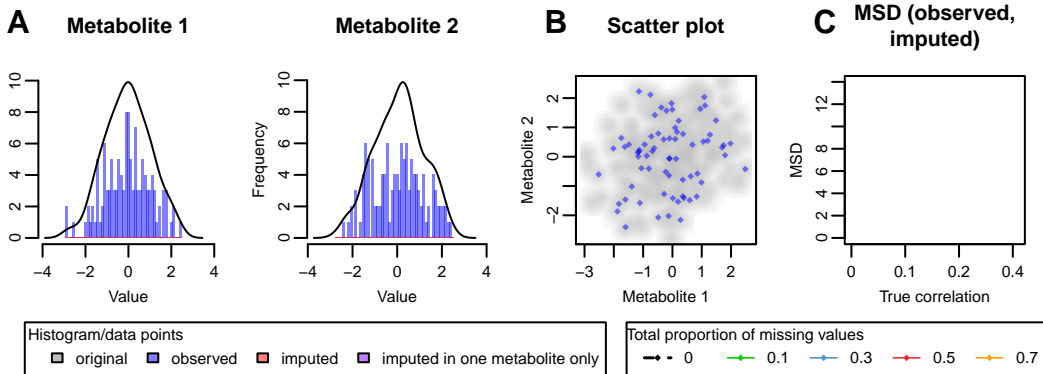




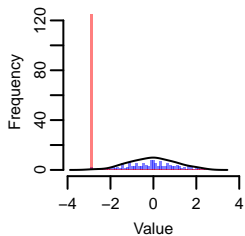




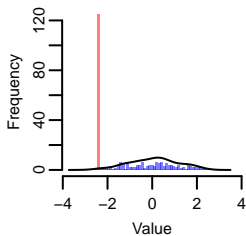




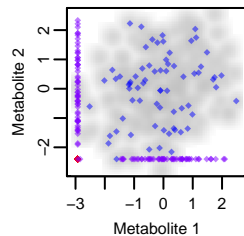
A Metabolite 1



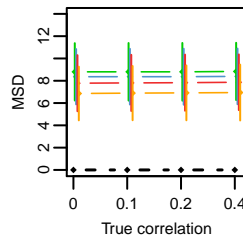
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



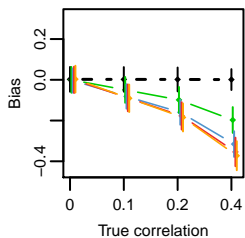
Histogram/data points

original observed imputed imputed in one metabolite only

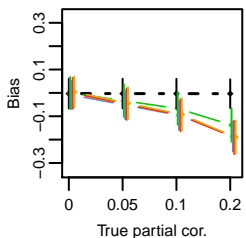
Total proportion of missing values

0 0.1 0.3 0.5 0.7

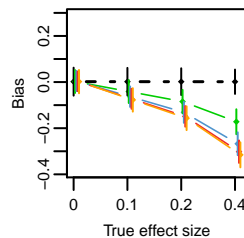
D Bias cor



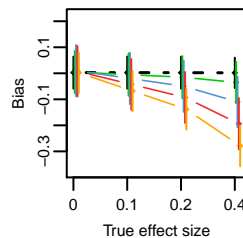
Bias pcor



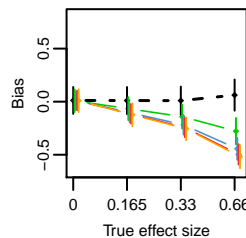
Bias lm phen ~ met



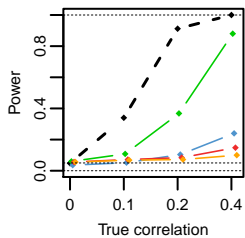
Bias lm met ~ phen



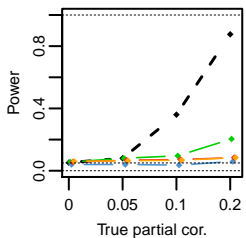
Bias logistic regr.



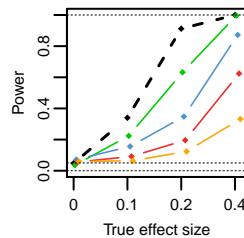
E Power cor



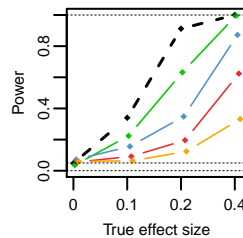
Power pcor



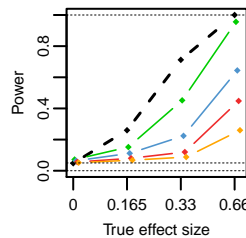
Power lm phen ~ met

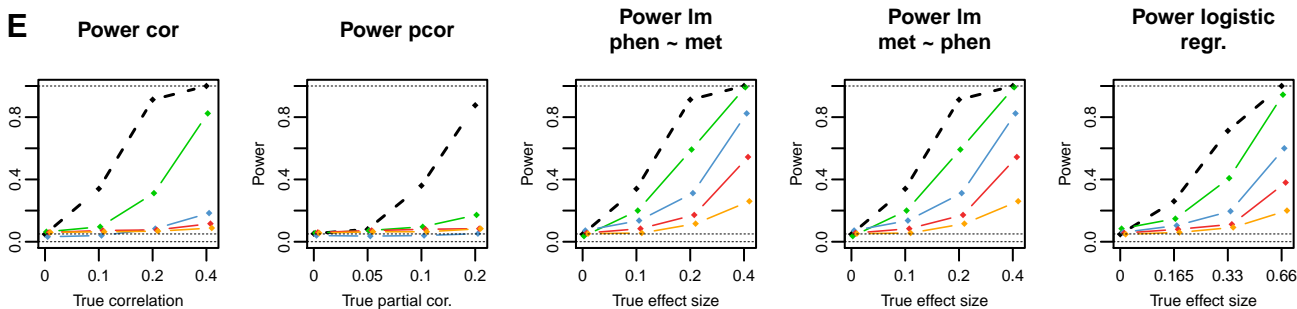
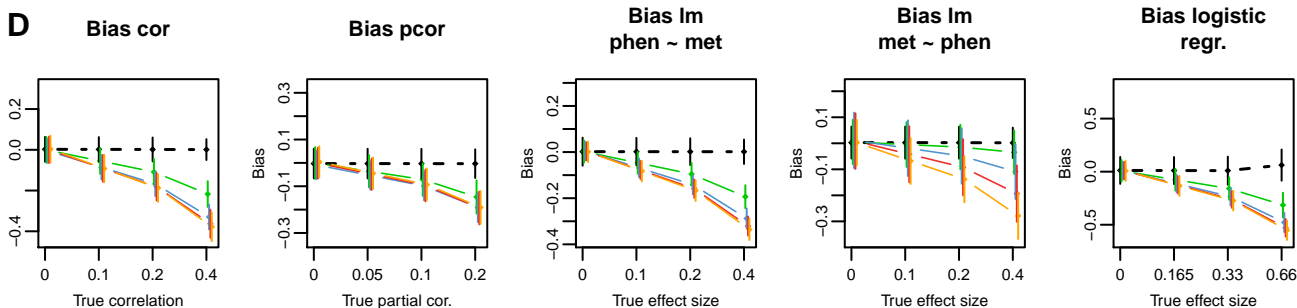
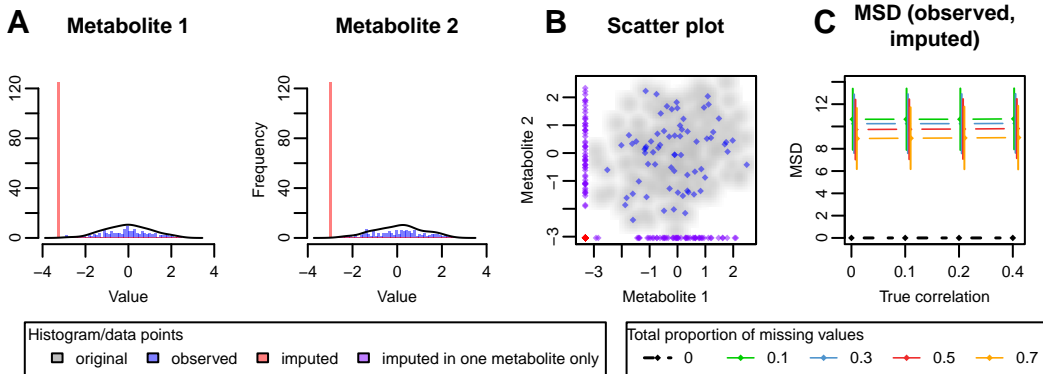


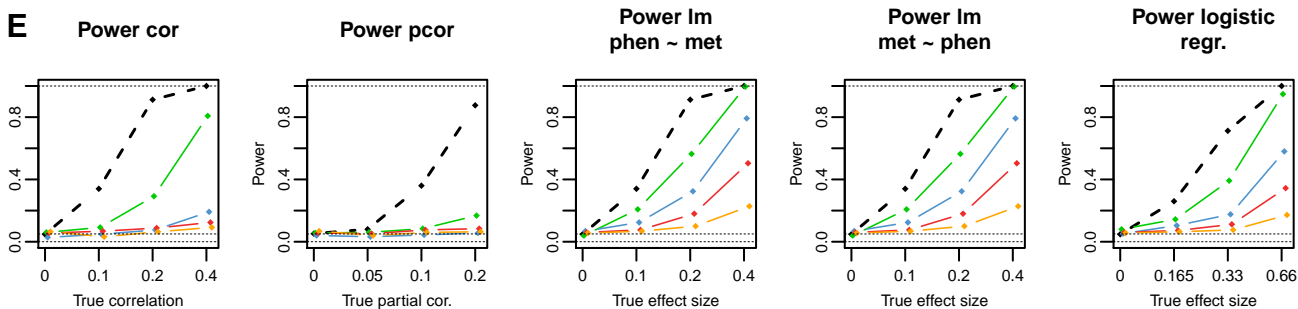
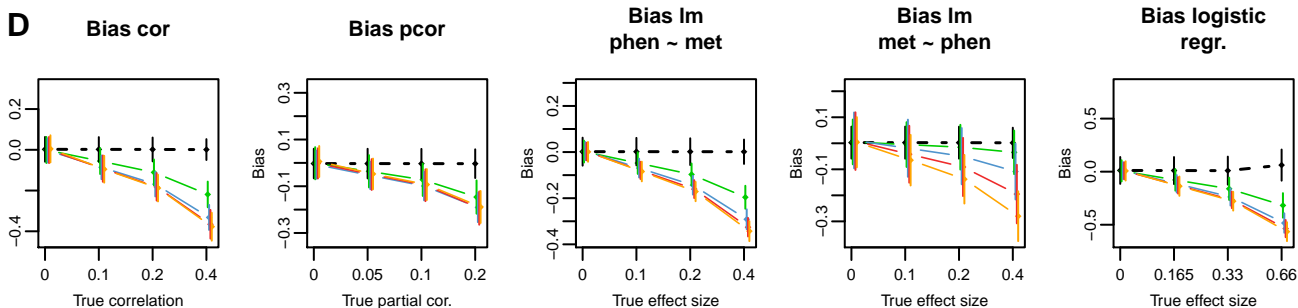
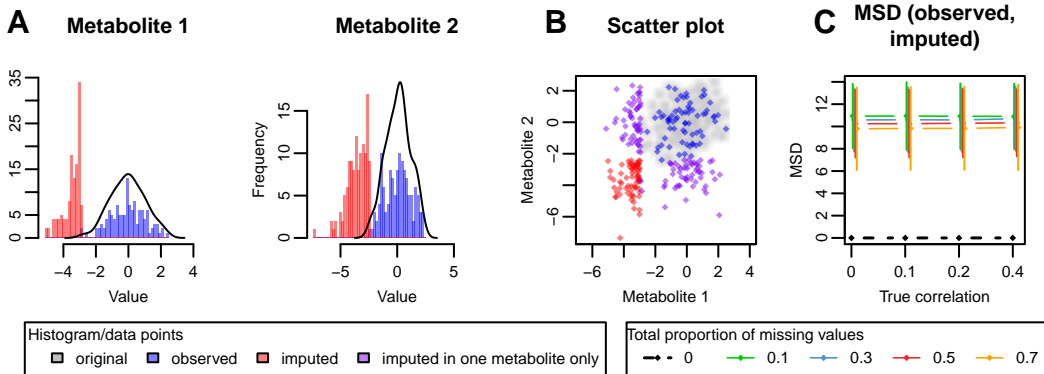
Power lm met ~ phen



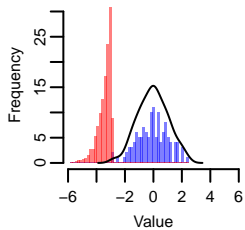
Power logistic regr.



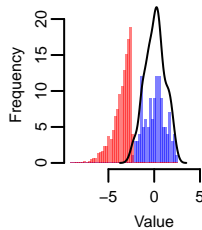




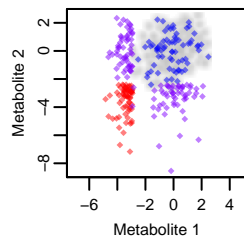
A Metabolite 1



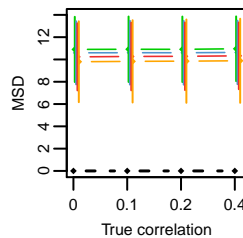
Metabolite 2



B Scatter plot



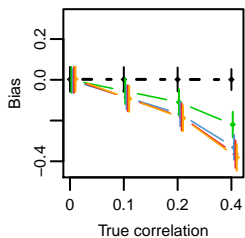
C MSD (observed, imputed)



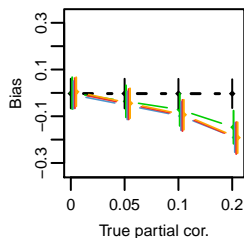
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 - - 0 — 0.1 — 0.3 — 0.5 — 0.7

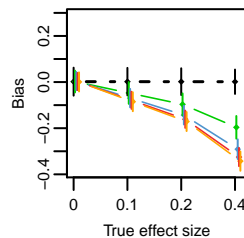
D Bias cor



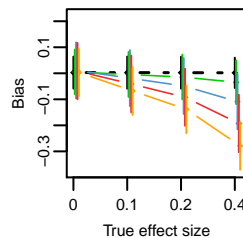
Bias pcor



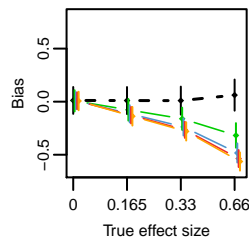
Bias Im phen ~ met



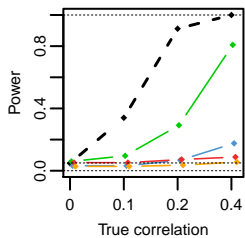
Bias Im met ~ phen



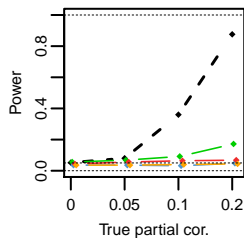
Bias logistic regr.



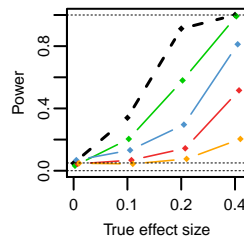
E Power cor



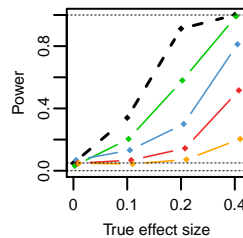
Power pcor



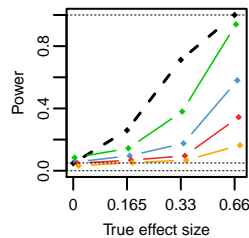
Power Im phen ~ met

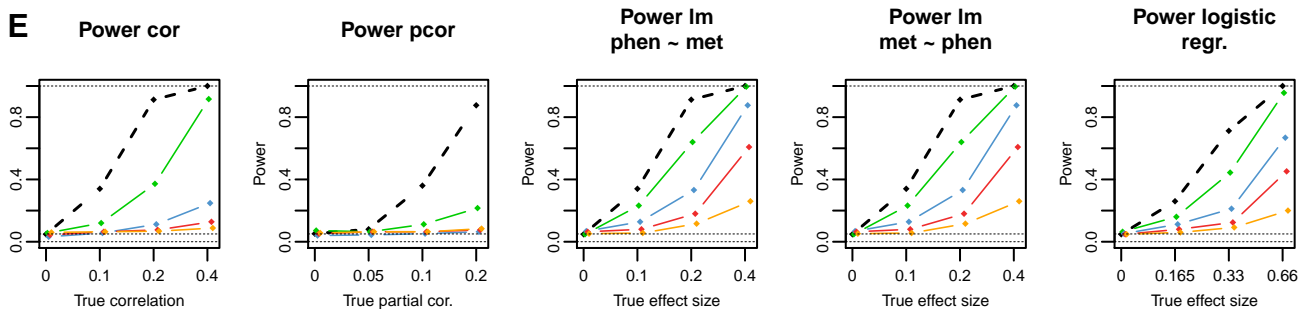
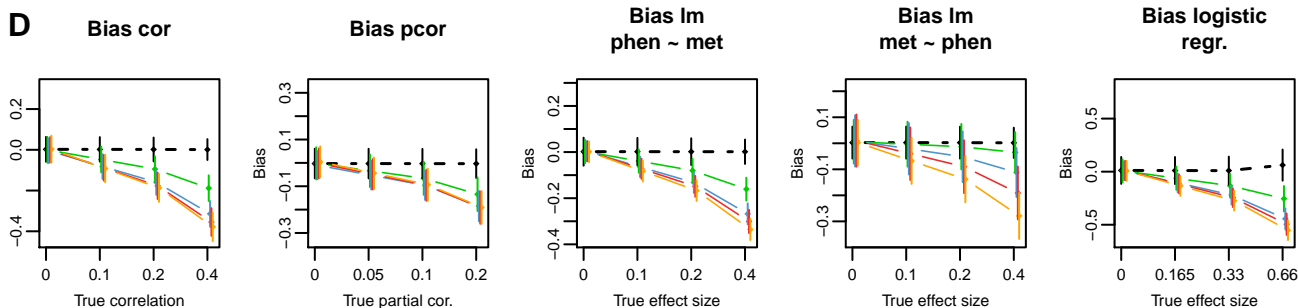
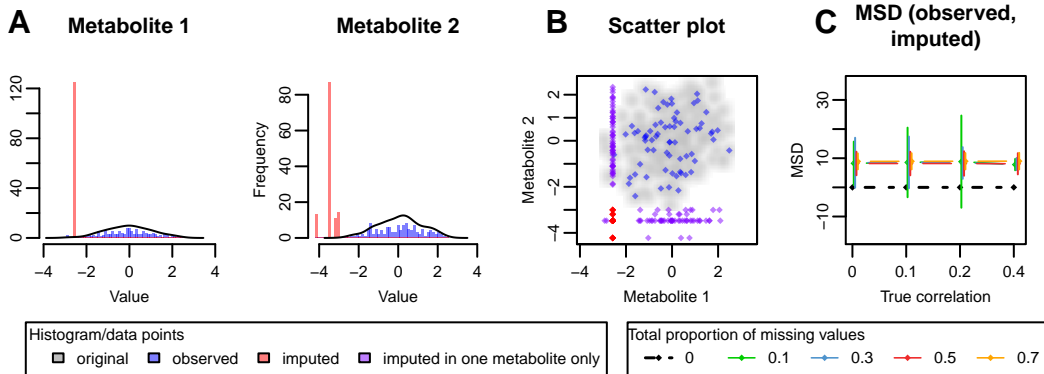


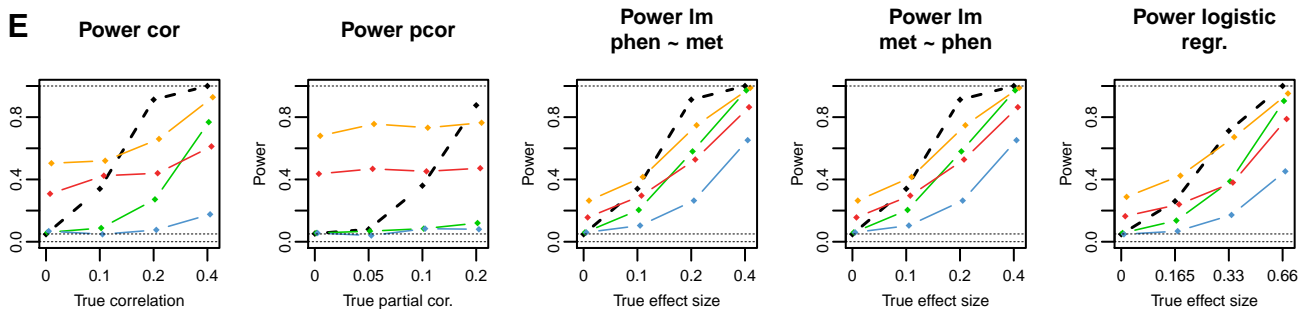
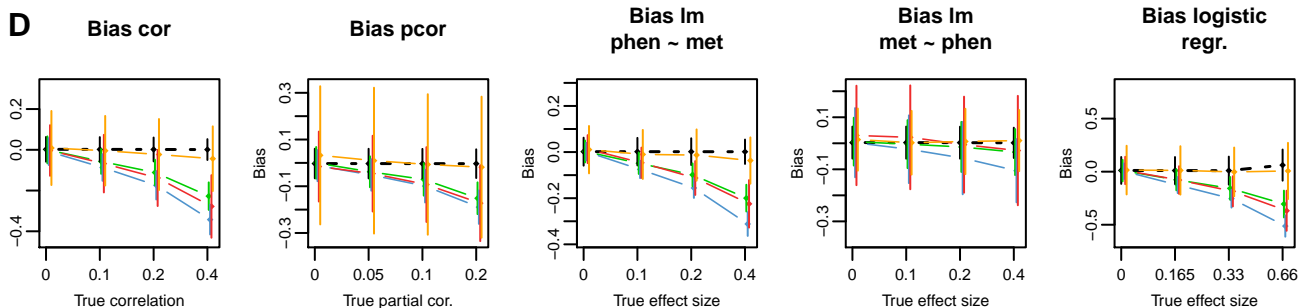
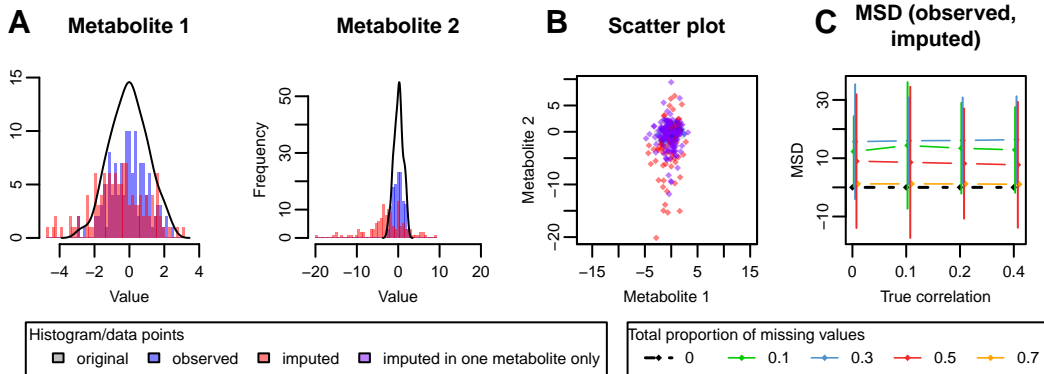
Power Im met ~ phen

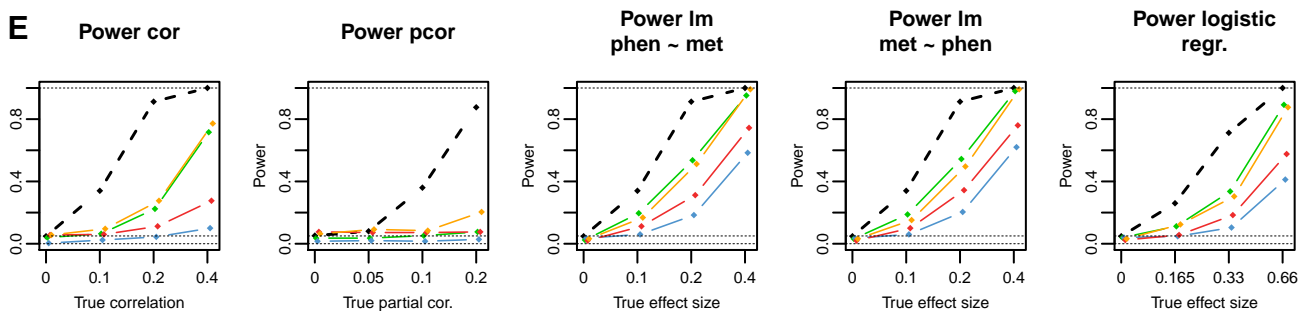
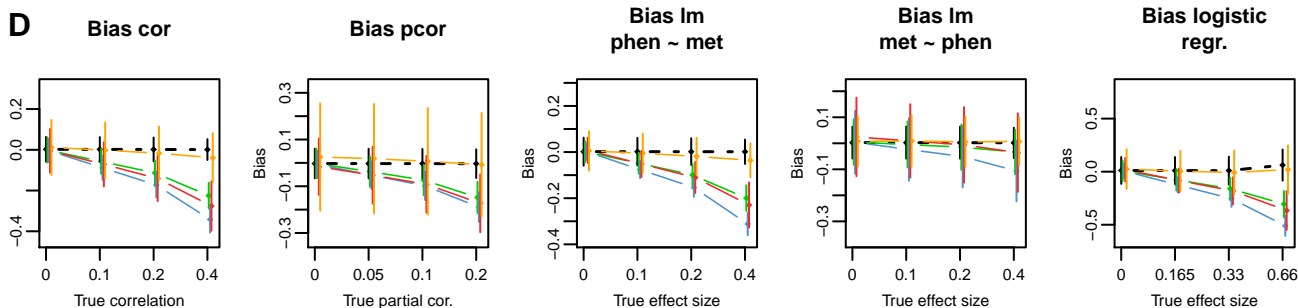
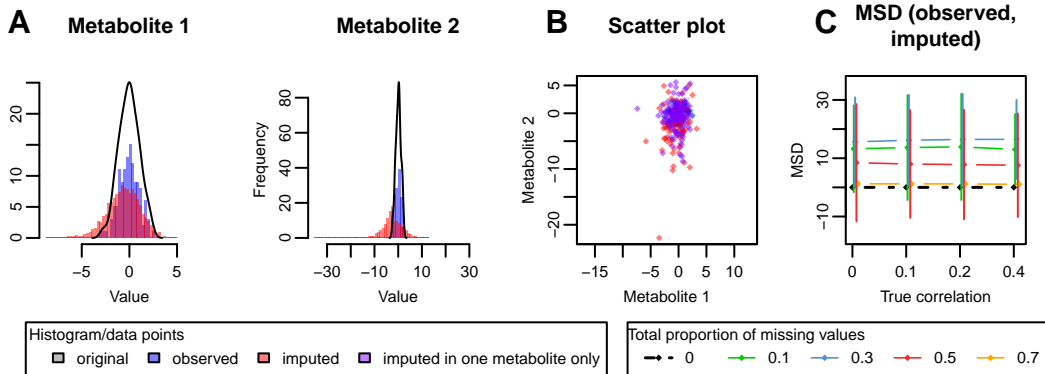


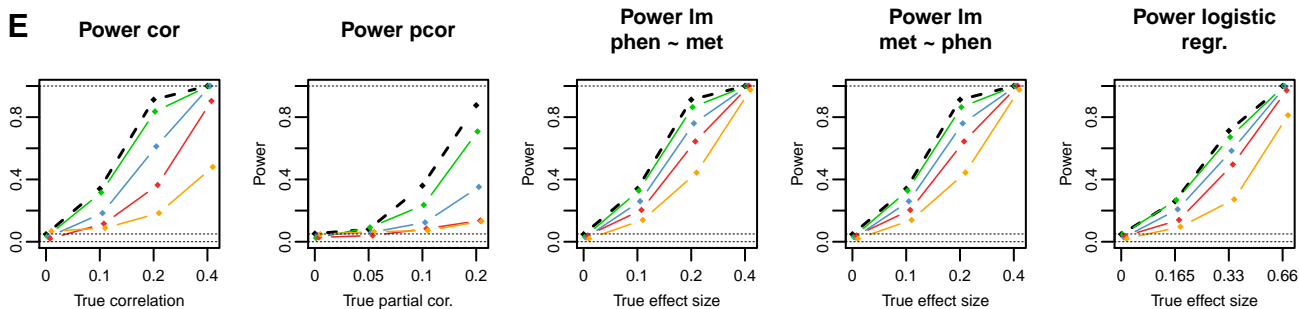
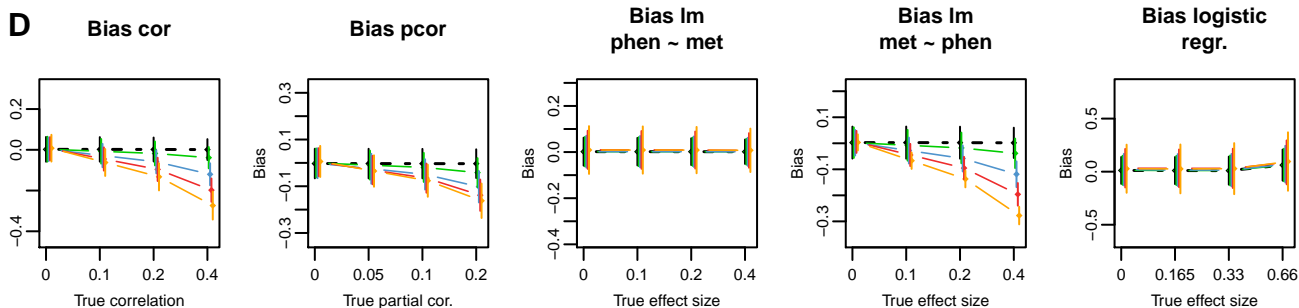
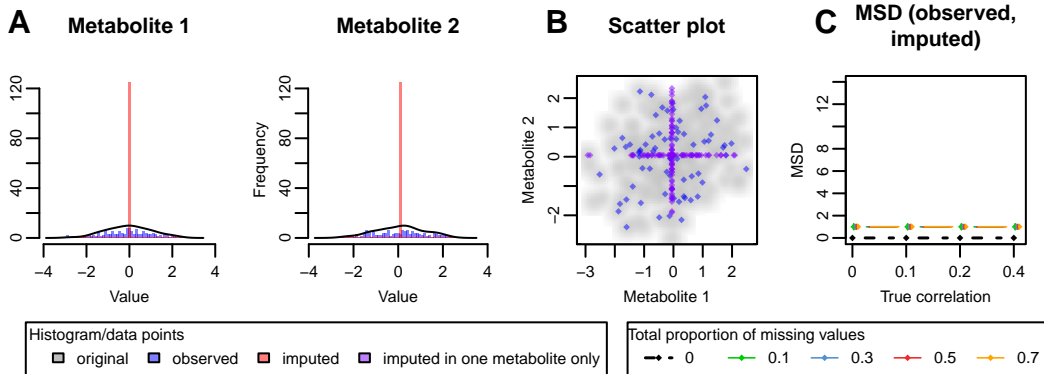
Power logistic regr.

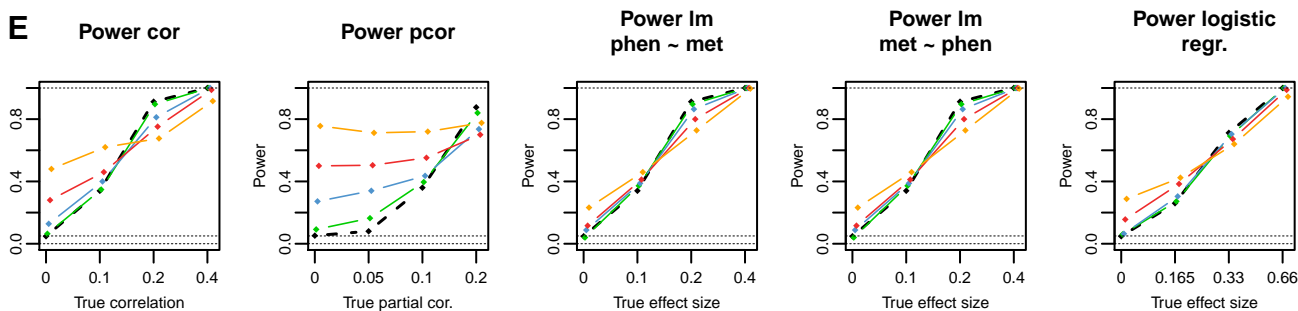
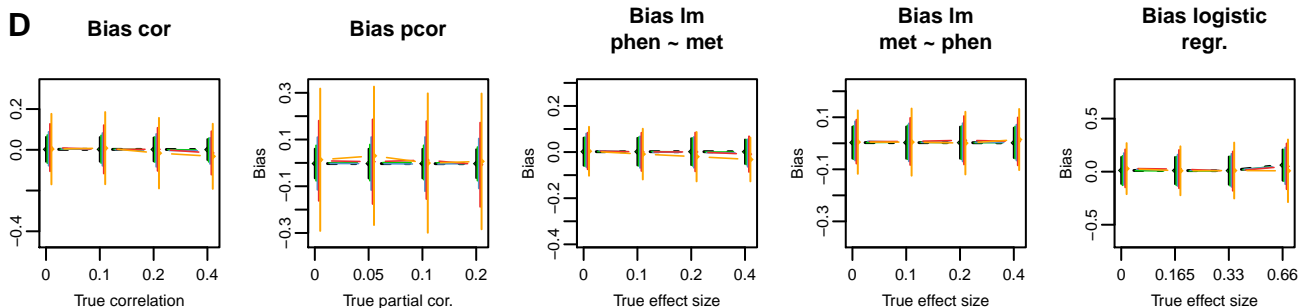
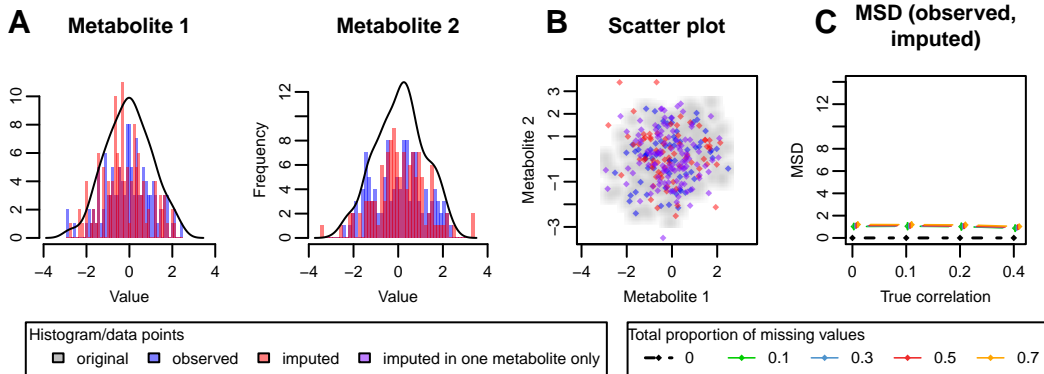




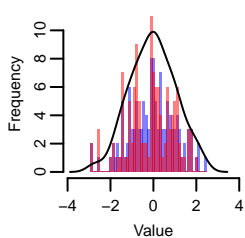




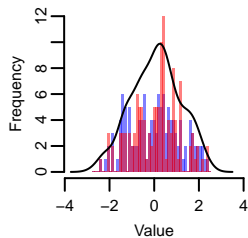




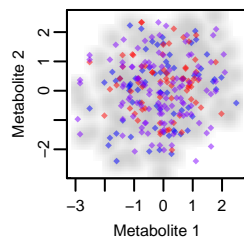
A Metabolite 1



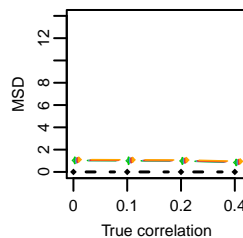
Metabolite 2



B Scatter plot



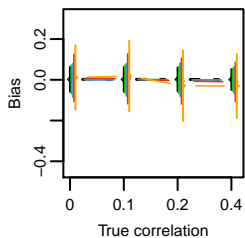
C MSD (observed, imputed)



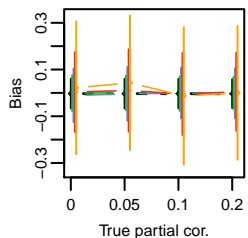
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 ● - 0 ● 0.1 ● 0.3 ● 0.5 ● 0.7

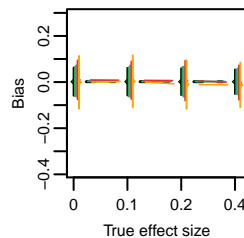
D Bias cor



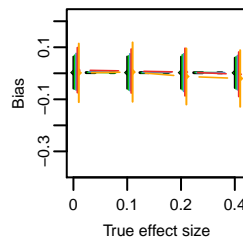
Bias pcor



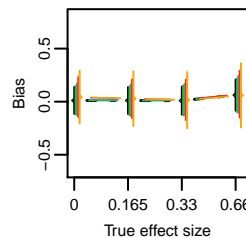
Bias lm phen ~ met



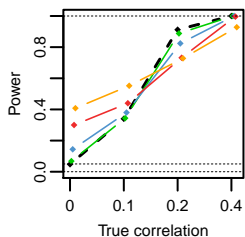
Bias lm met ~ phen



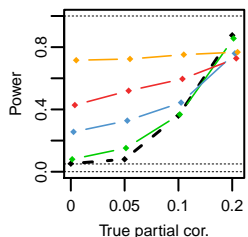
Bias logistic regr.



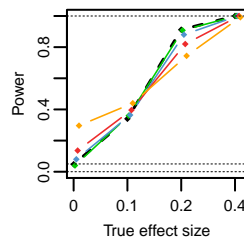
E Power cor



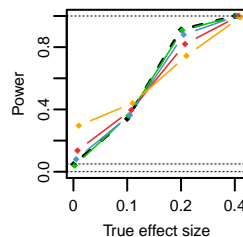
Power pcor



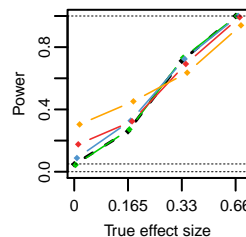
Power lm phen ~ met

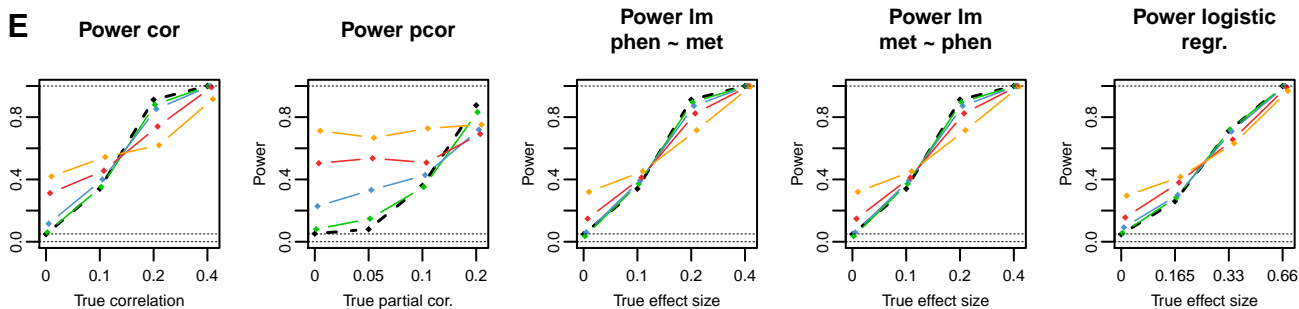
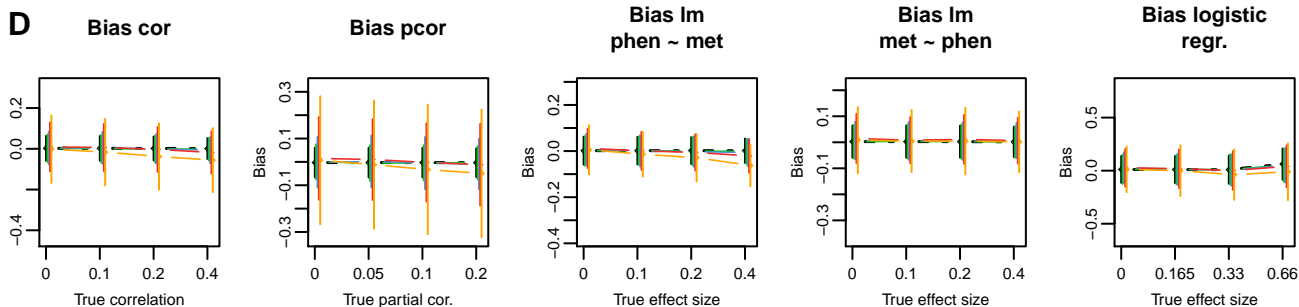
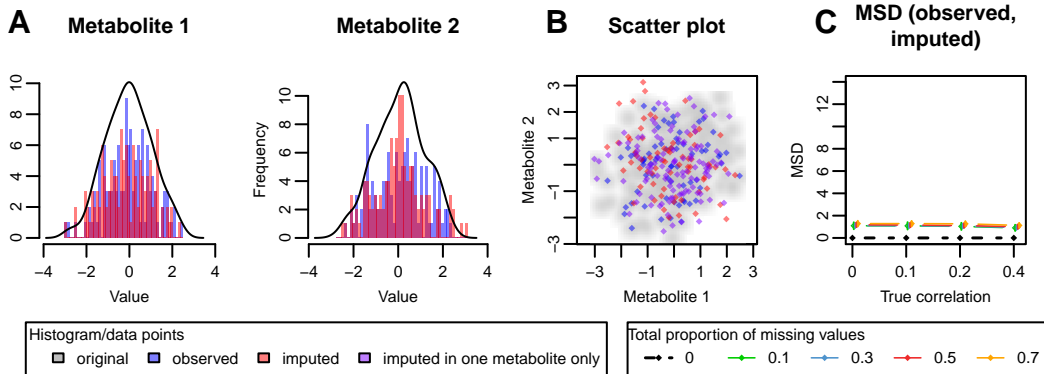


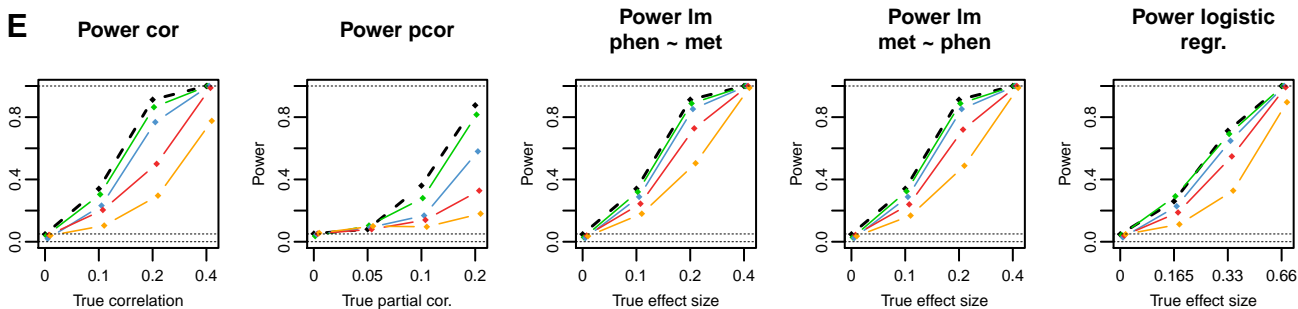
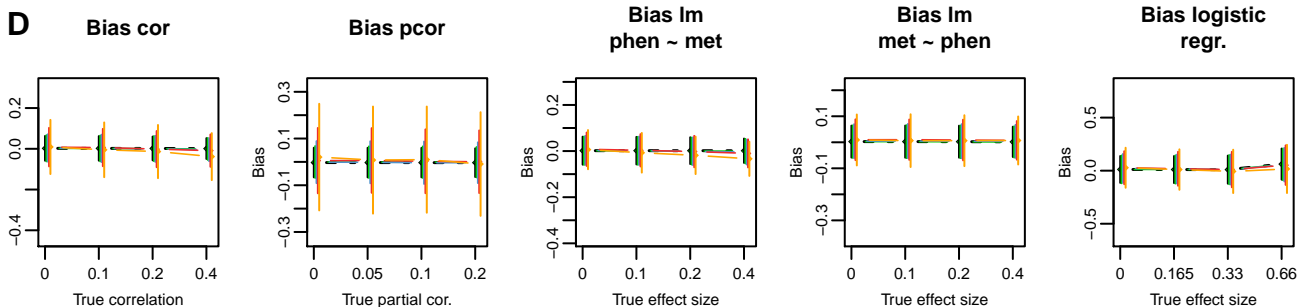
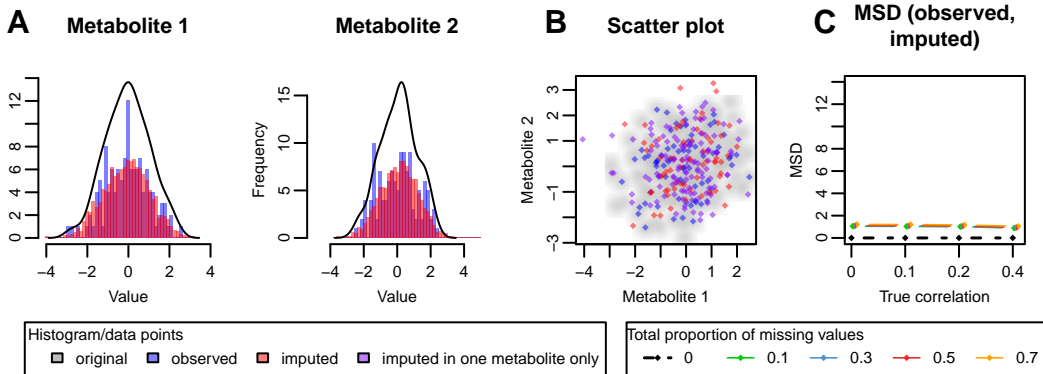
Power lm met ~ phen

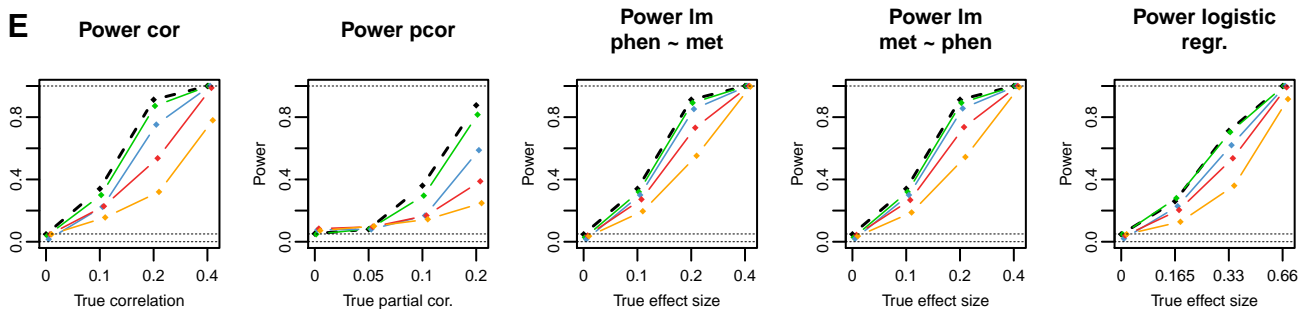
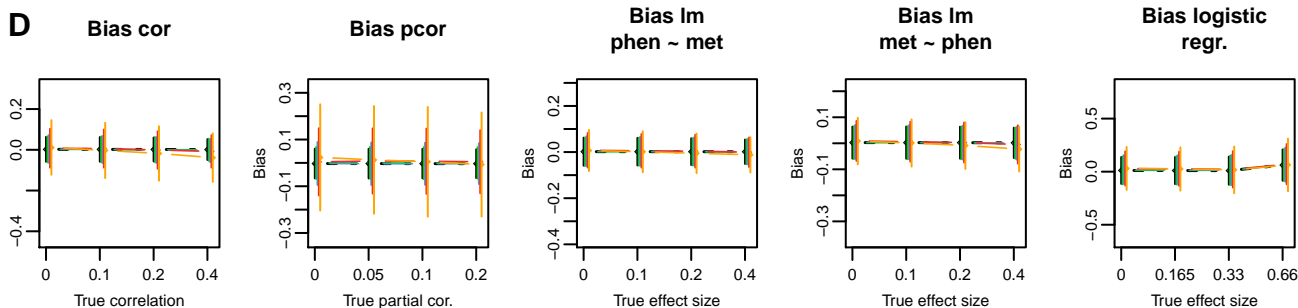
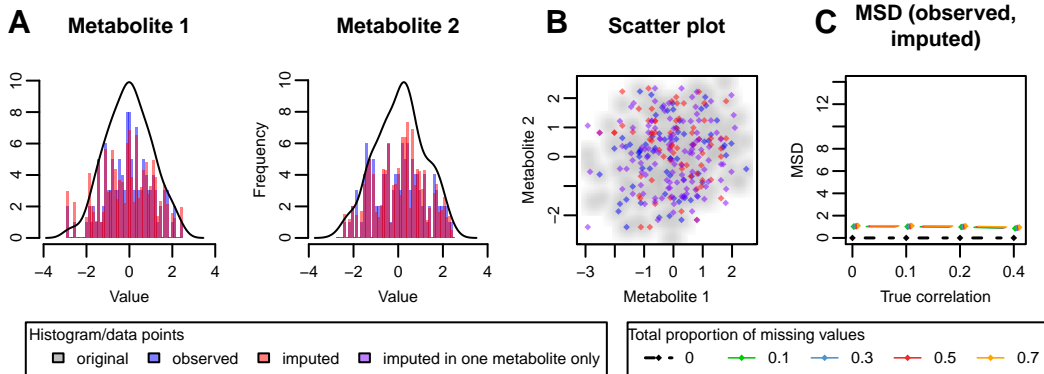


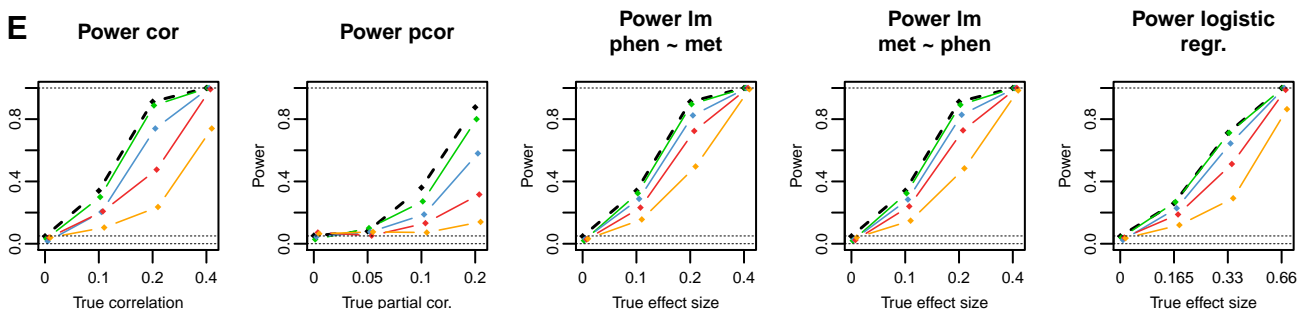
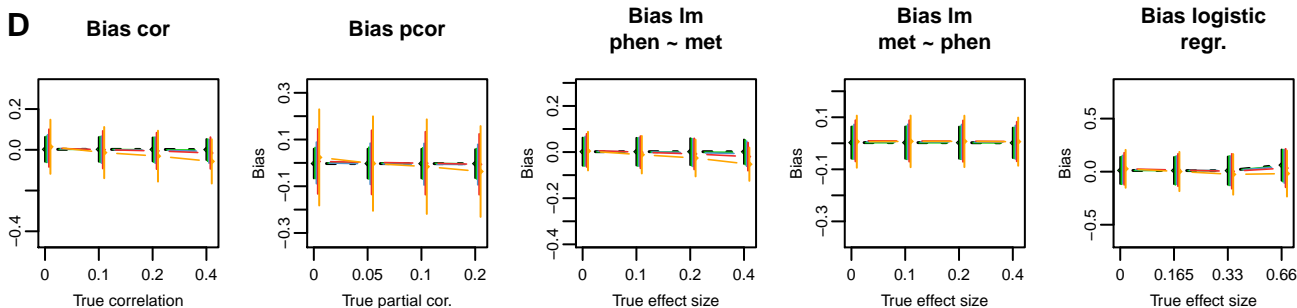
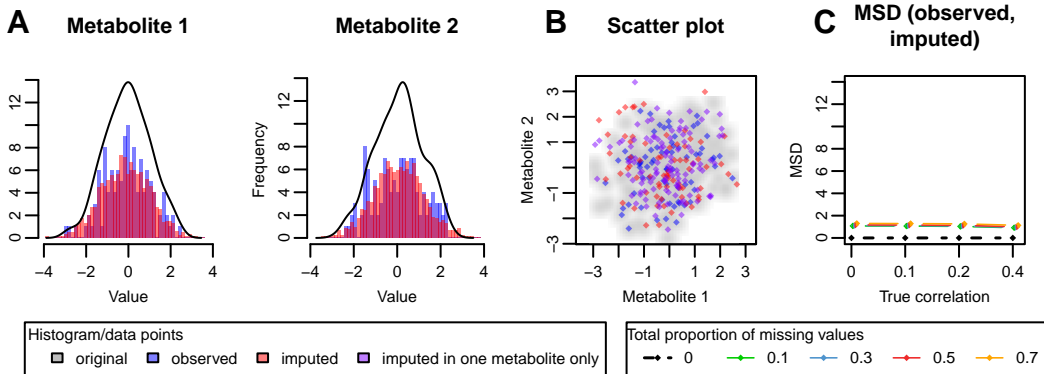
Power logistic regr.

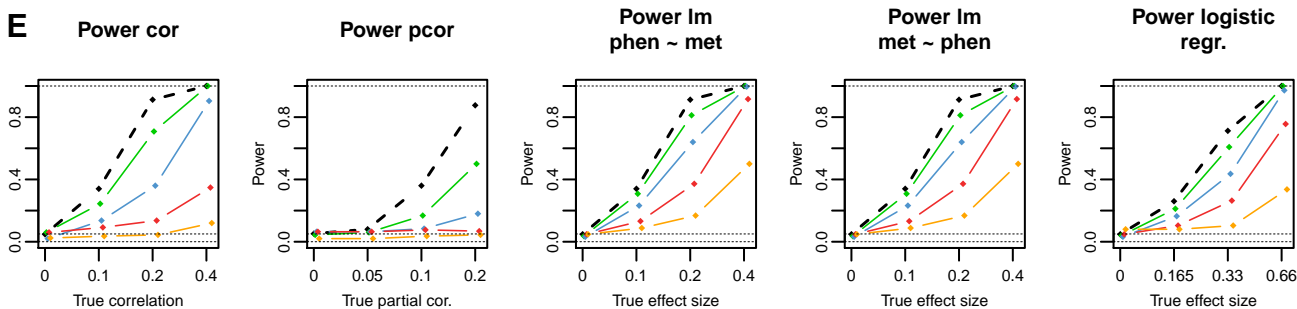
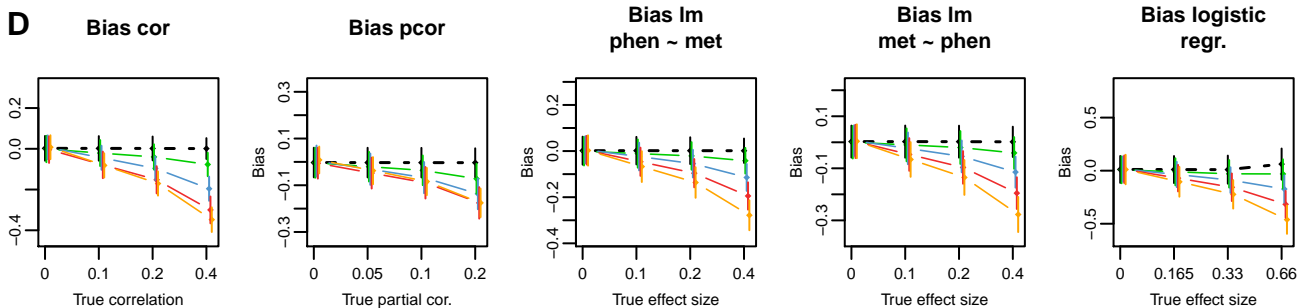
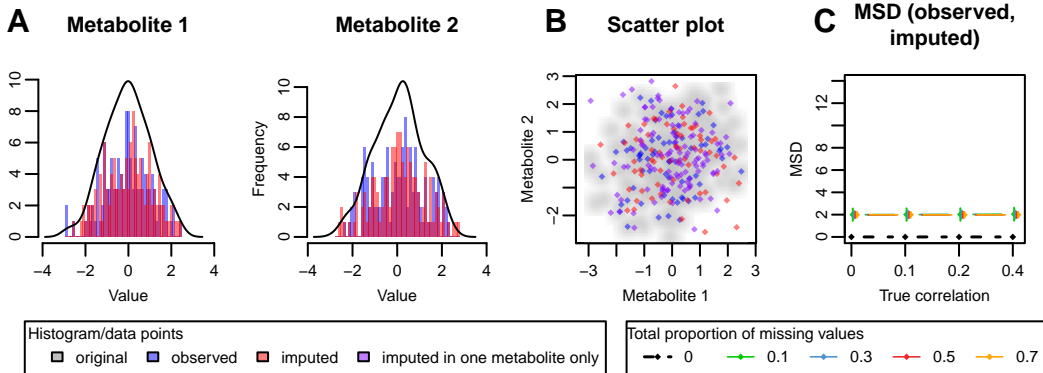


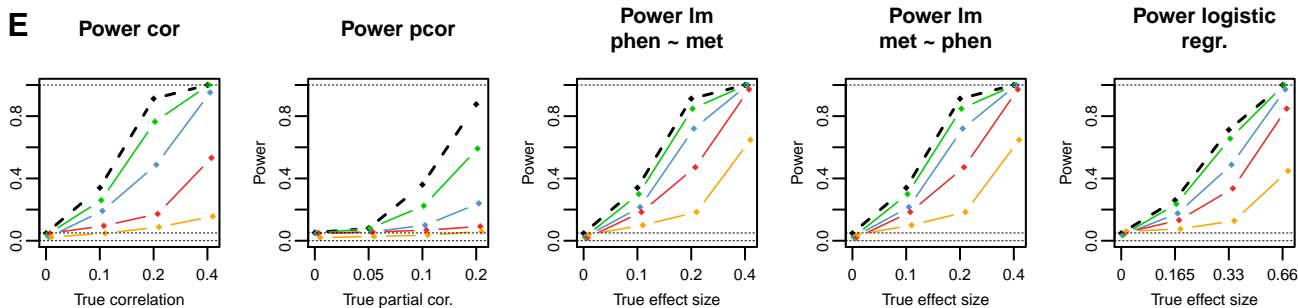
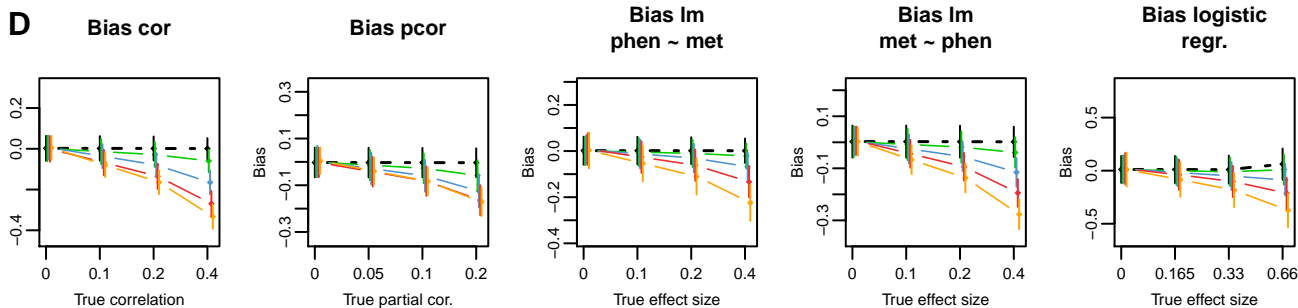
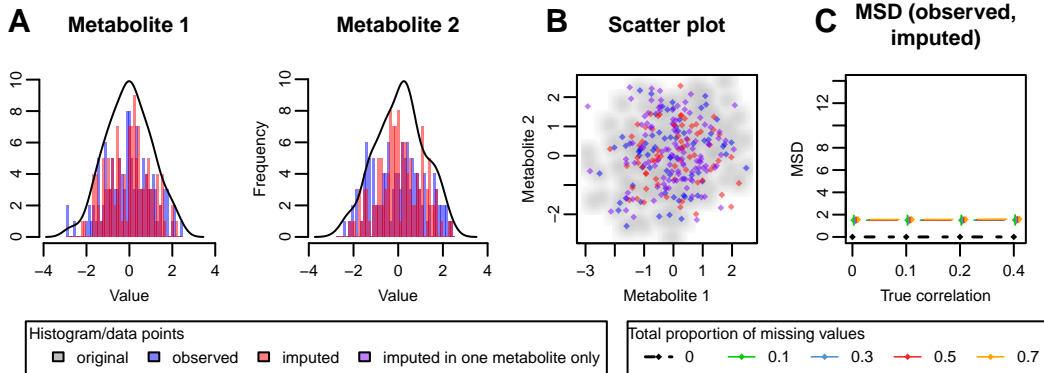




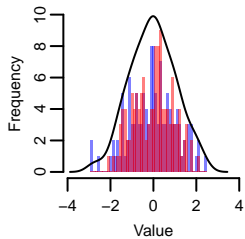




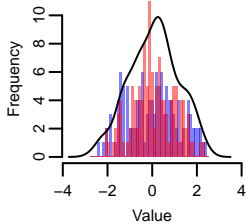




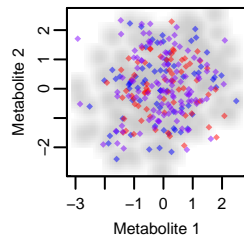
A Metabolite 1



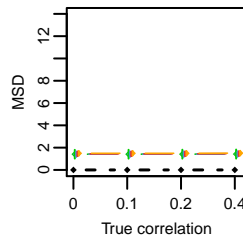
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



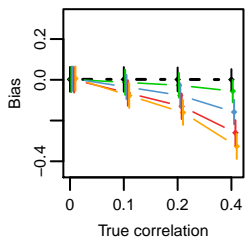
Histogram/data points

original observed imputed imputed in one metabolite only

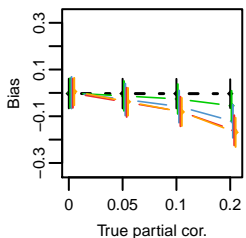
Total proportion of missing values

0 0.1 0.3 0.5 0.7

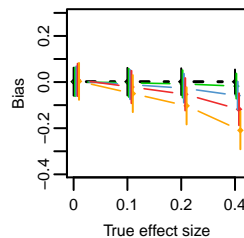
D Bias cor



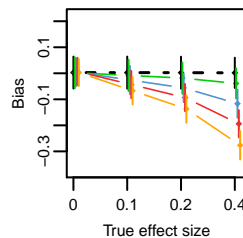
Bias pcor



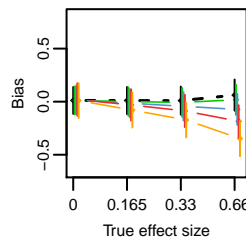
Bias lm phen ~ met



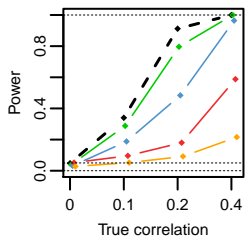
Bias lm met ~ phen



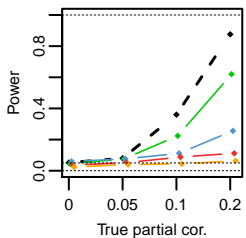
Bias logistic regr.



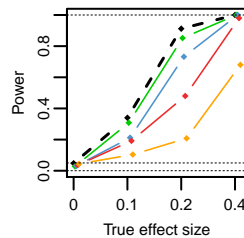
E Power cor



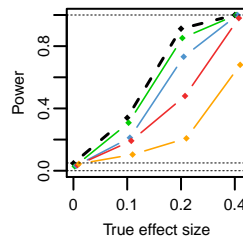
Power pcor



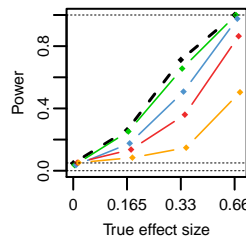
Power lm phen ~ met



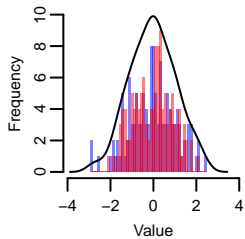
Power lm met ~ phen



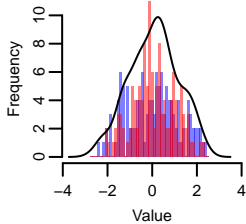
Power logistic regr.



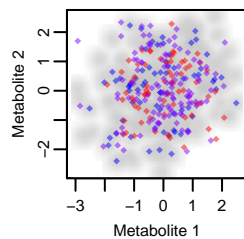
A Metabolite 1



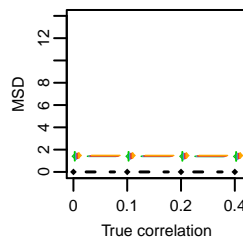
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



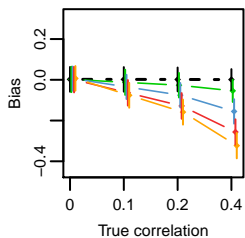
Histogram/data points

original observed imputed imputed in one metabolite only

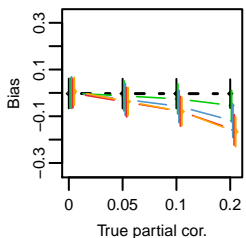
Total proportion of missing values

0 0.1 0.3 0.5 0.7

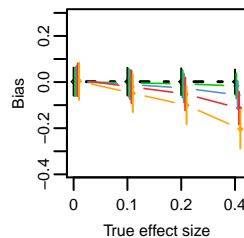
D Bias cor



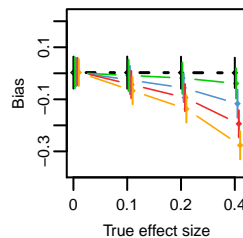
Bias pcor



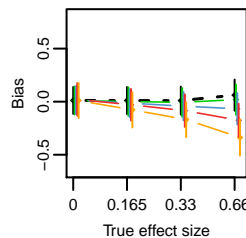
Bias lm phen ~ met



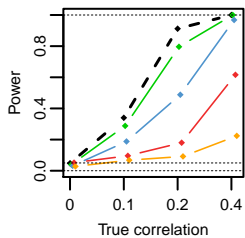
Bias lm met ~ phen



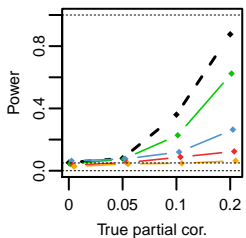
Bias logistic regr.



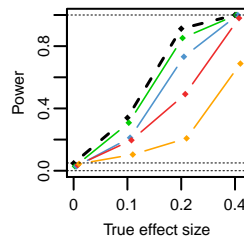
E Power cor



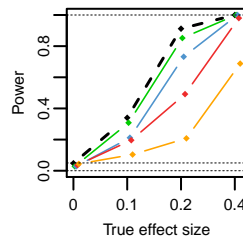
Power pcor



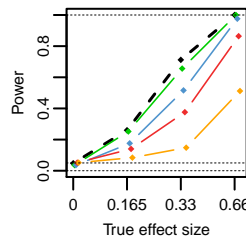
Power lm phen ~ met



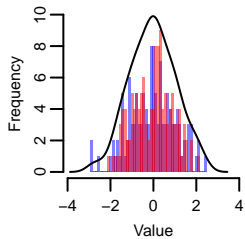
Power lm met ~ phen



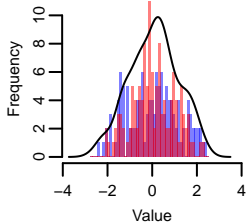
Power logistic regr.



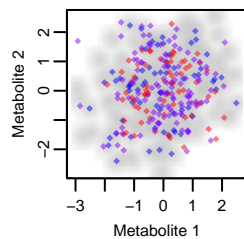
A Metabolite 1



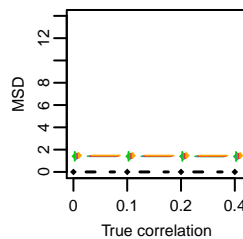
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



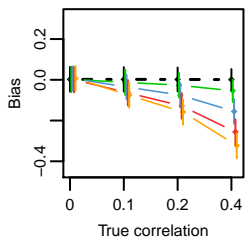
Histogram/data points

original observed imputed imputed in one metabolite only

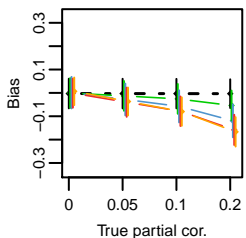
Total proportion of missing values

0 0.1 0.3 0.5 0.7

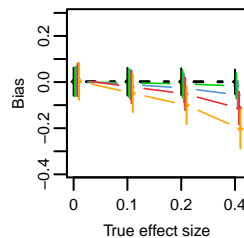
D Bias cor



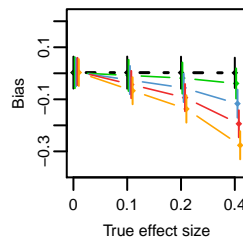
Bias pcor



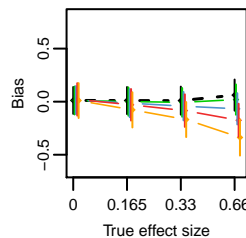
Bias Im phen ~ met



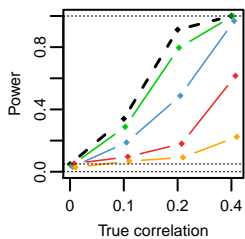
Bias Im met ~ phen



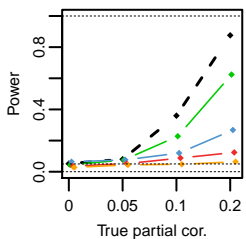
Bias logistic regr.



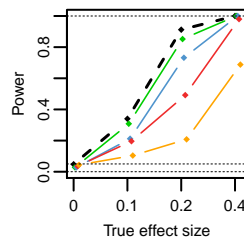
E Power cor



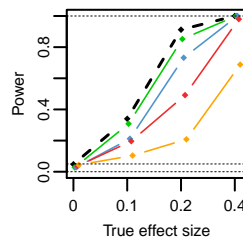
Power pcor



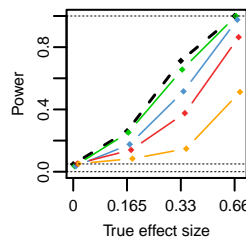
Power Im phen ~ met

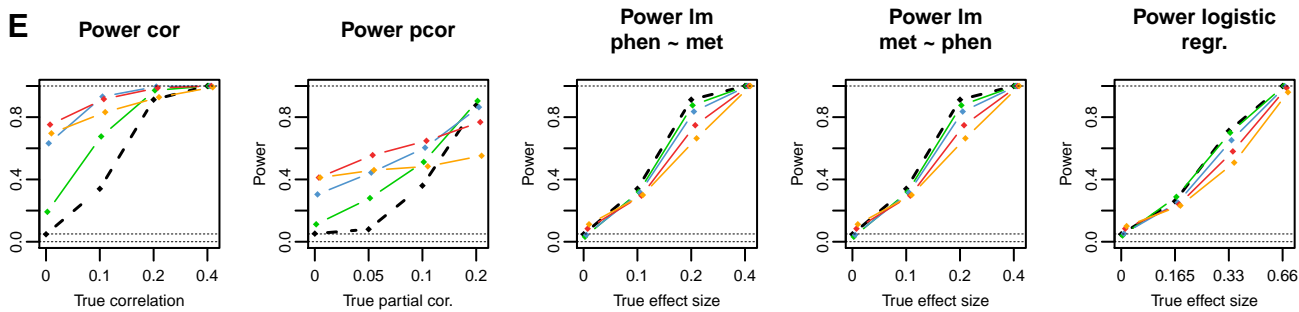
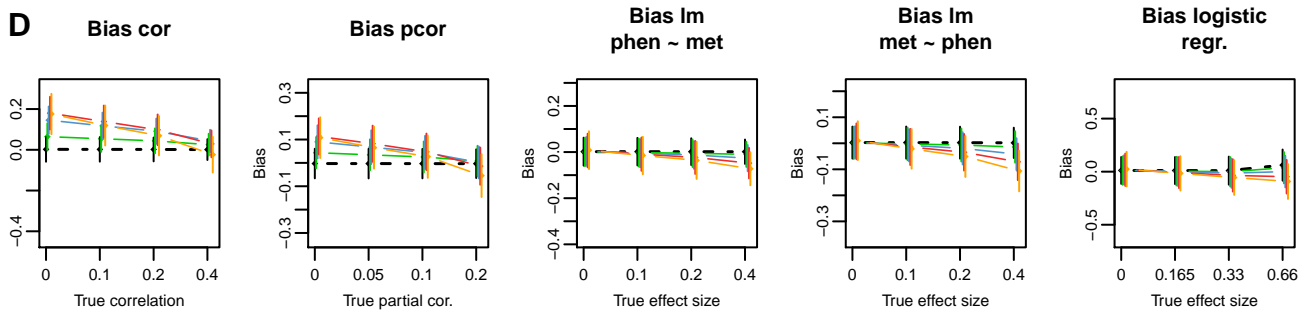
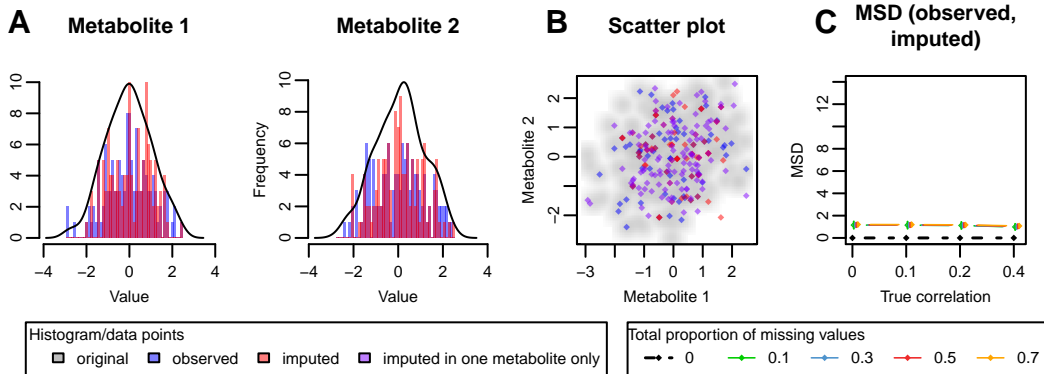


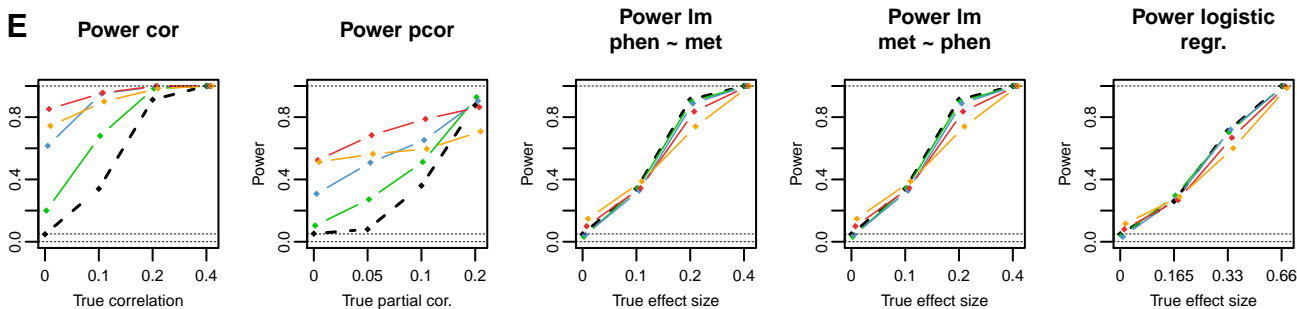
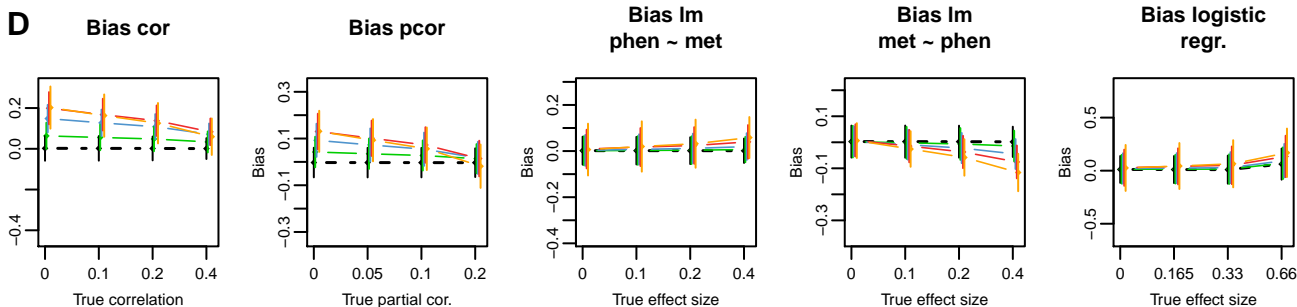
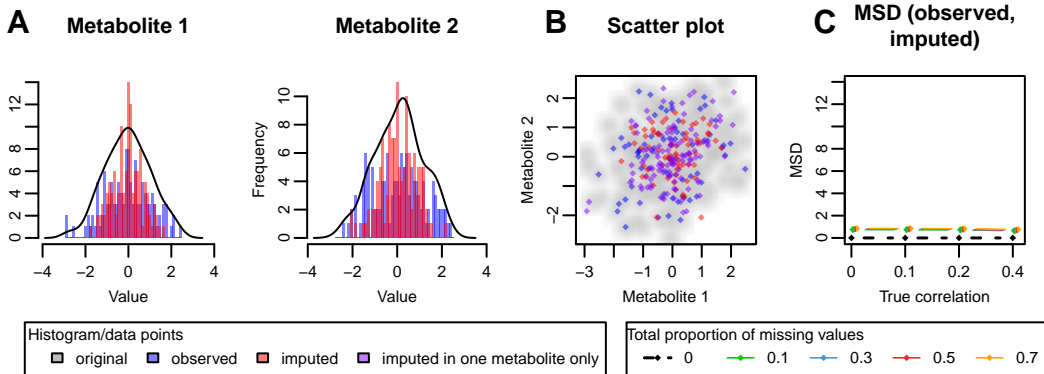
Power Im met ~ phen

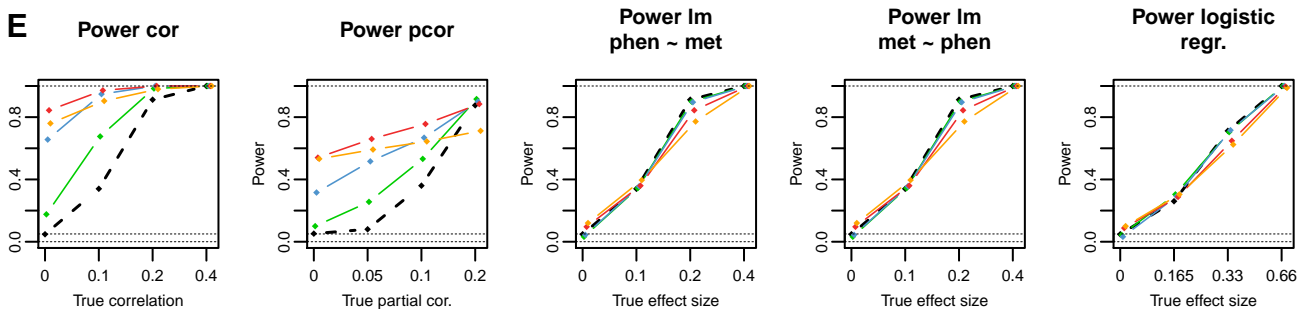
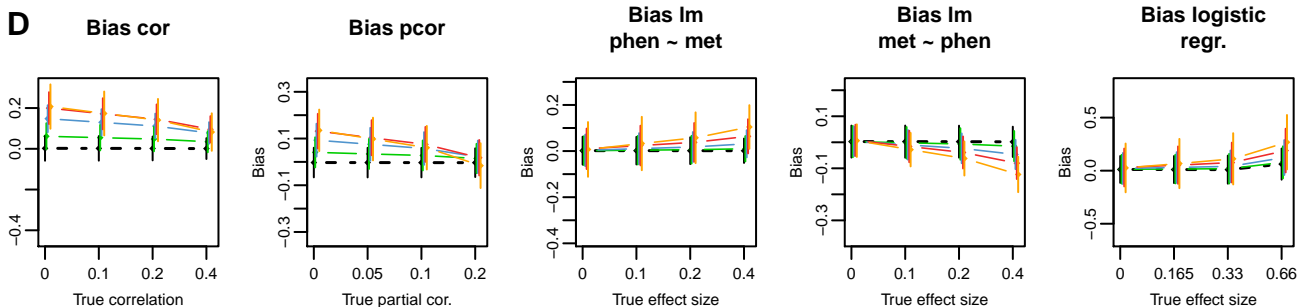
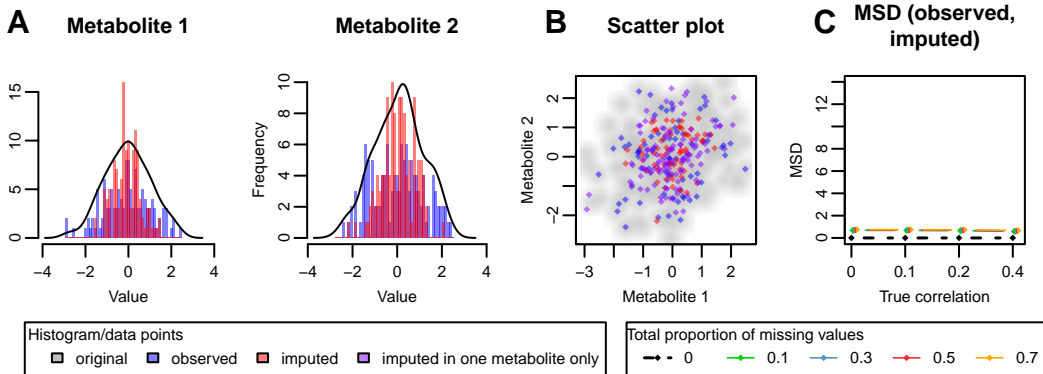


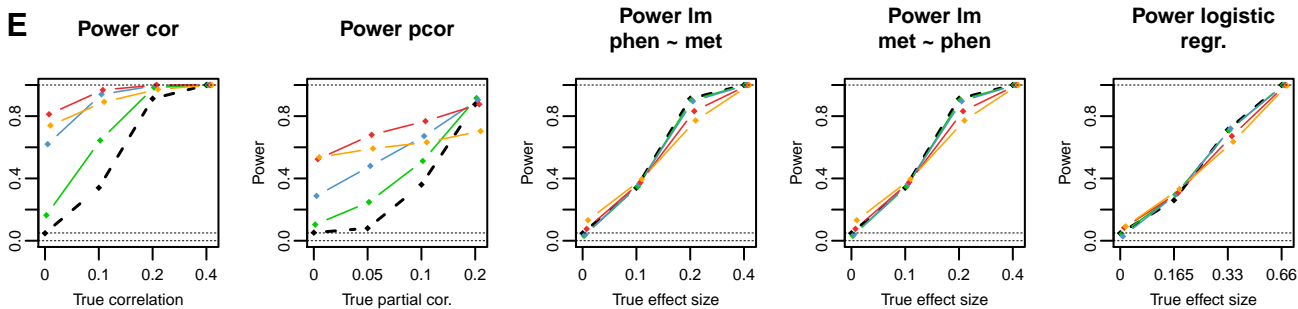
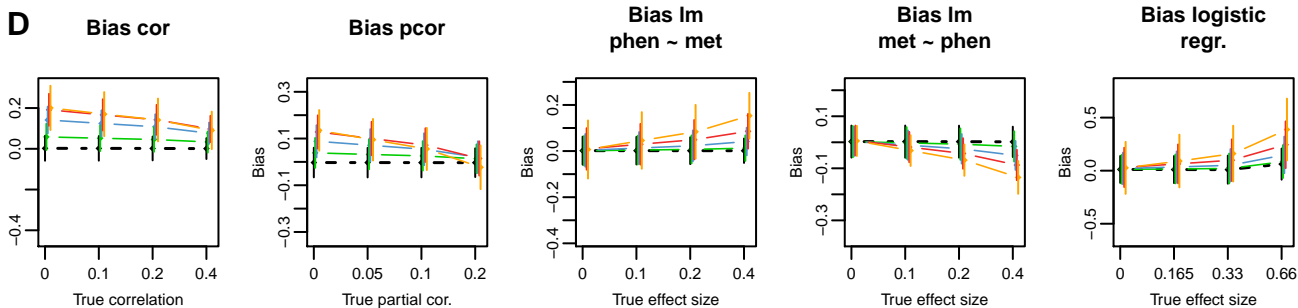
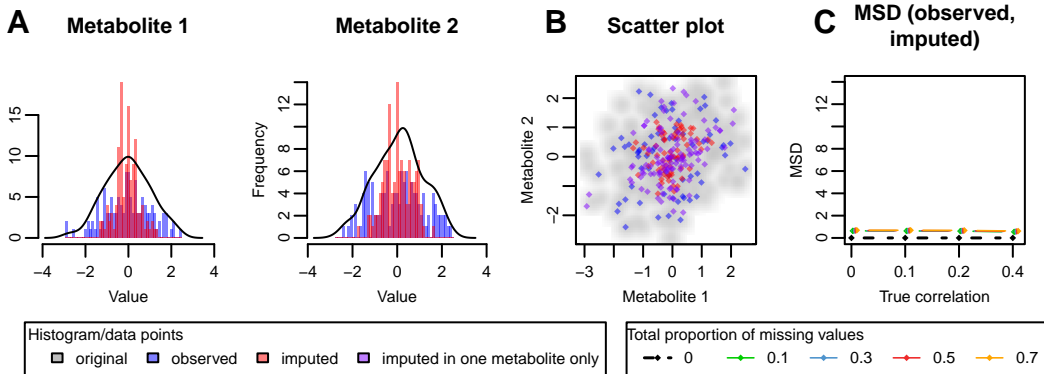
Power logistic regr.

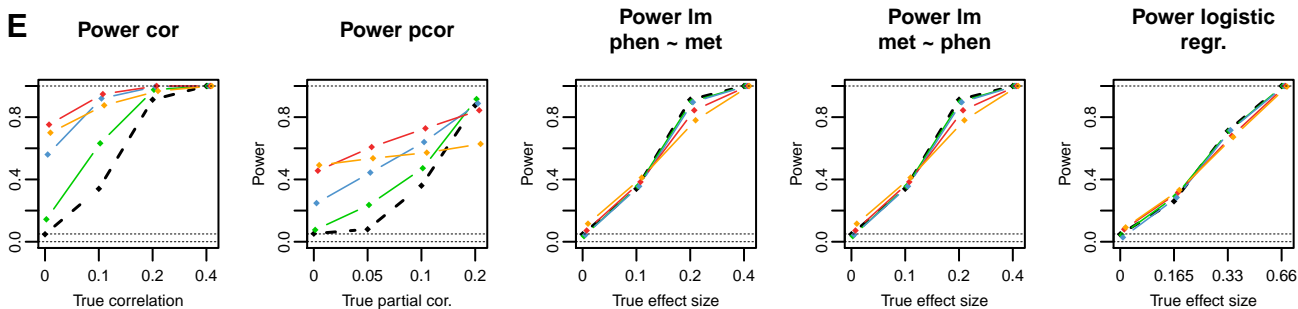
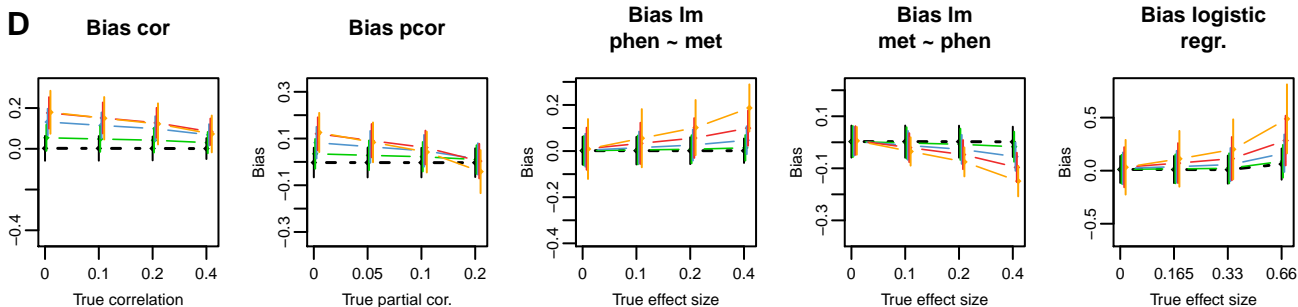
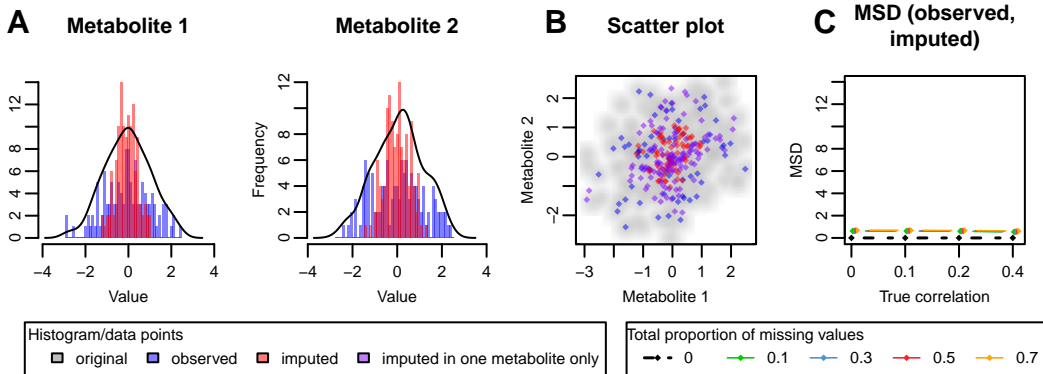


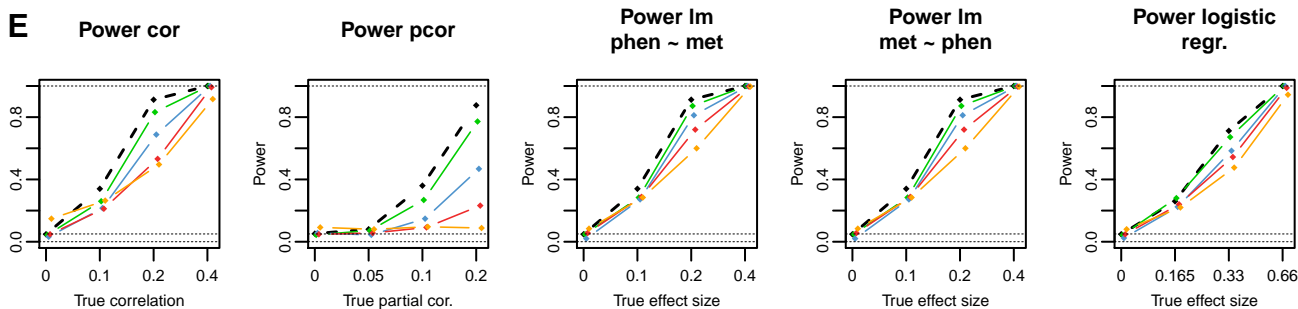
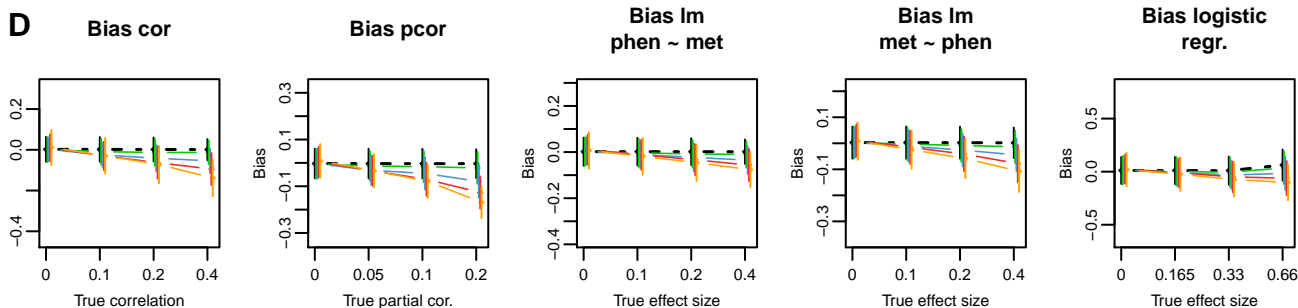
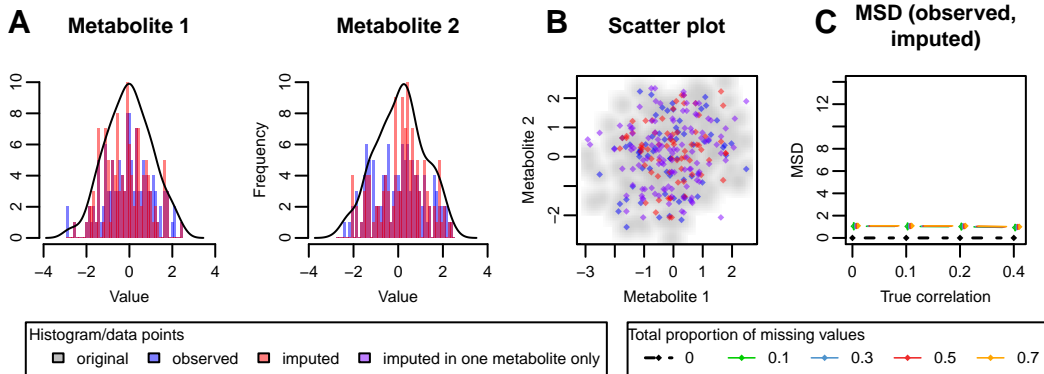


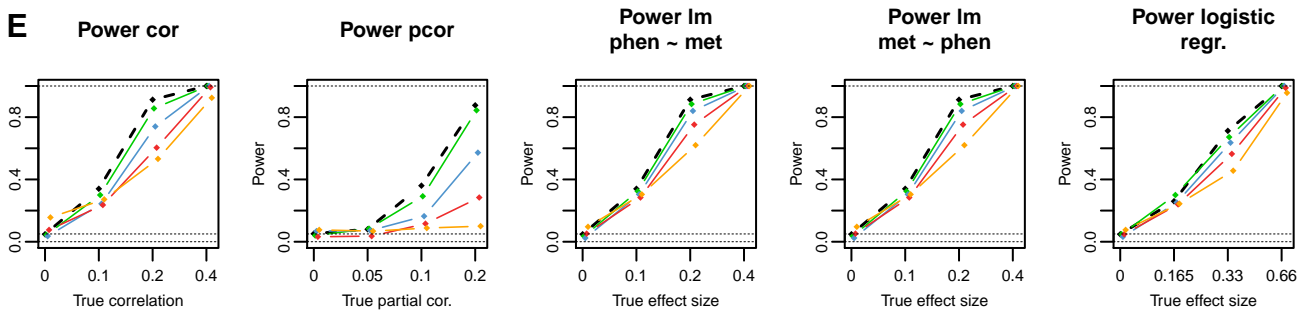
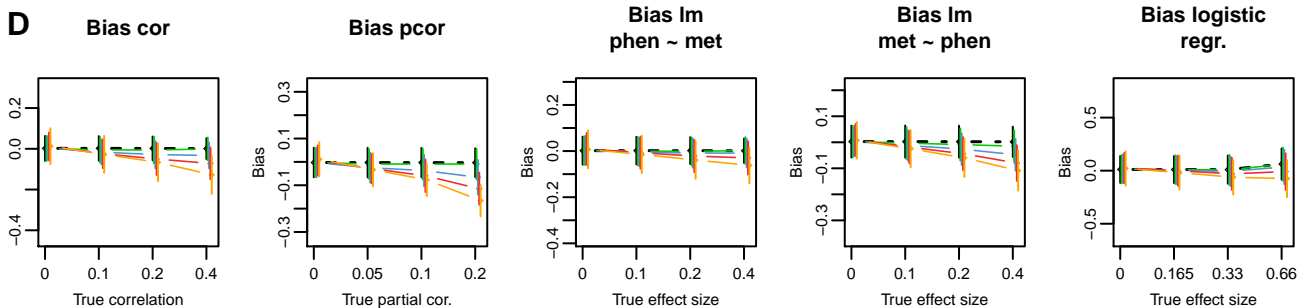
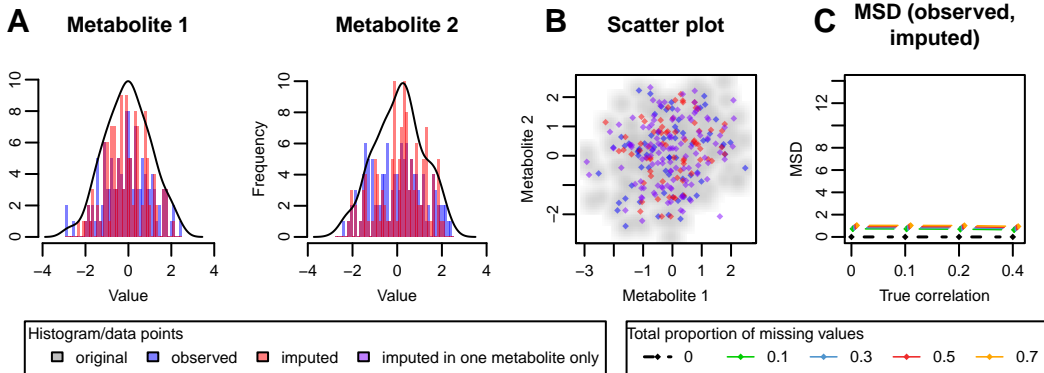


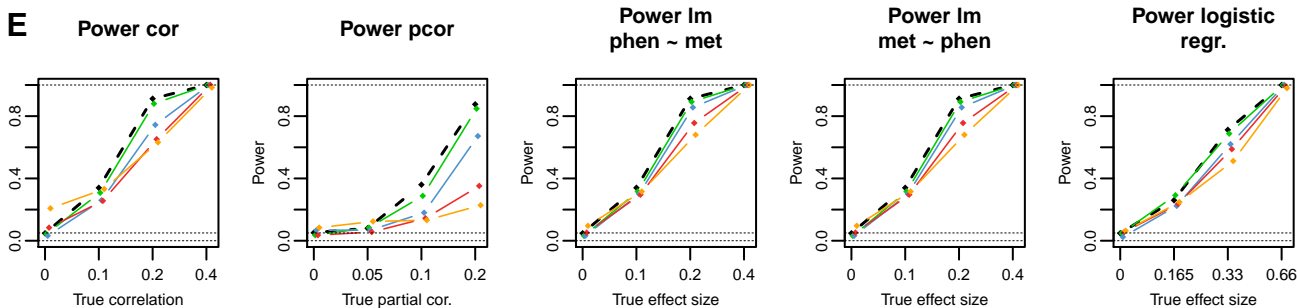
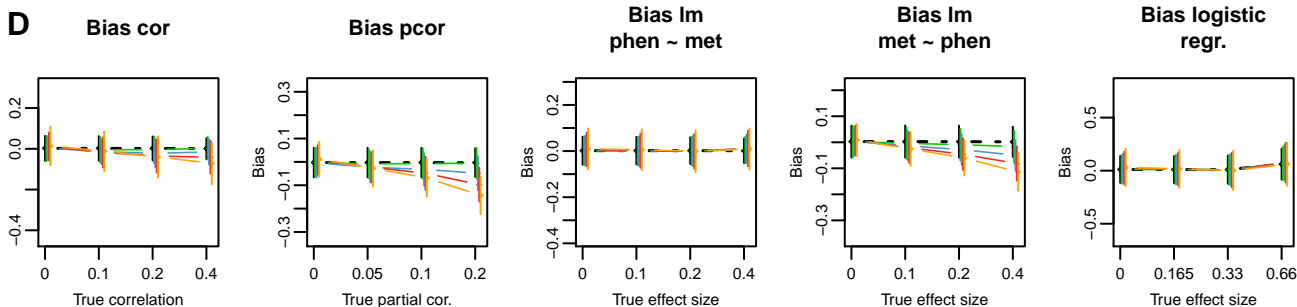
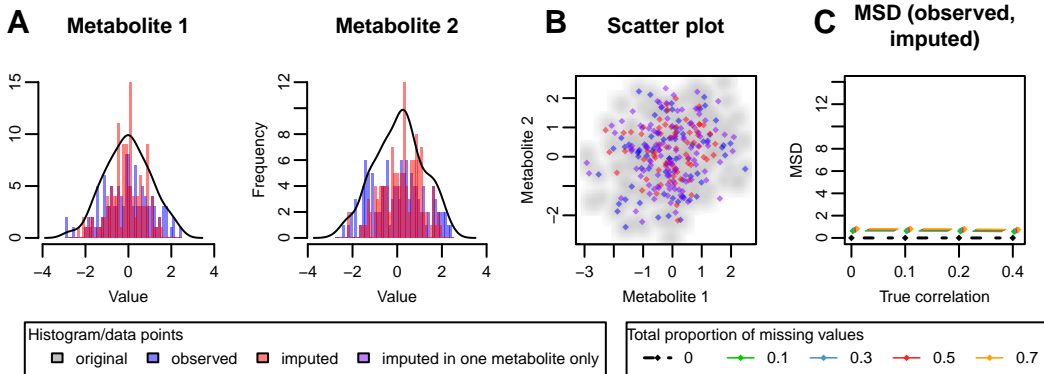


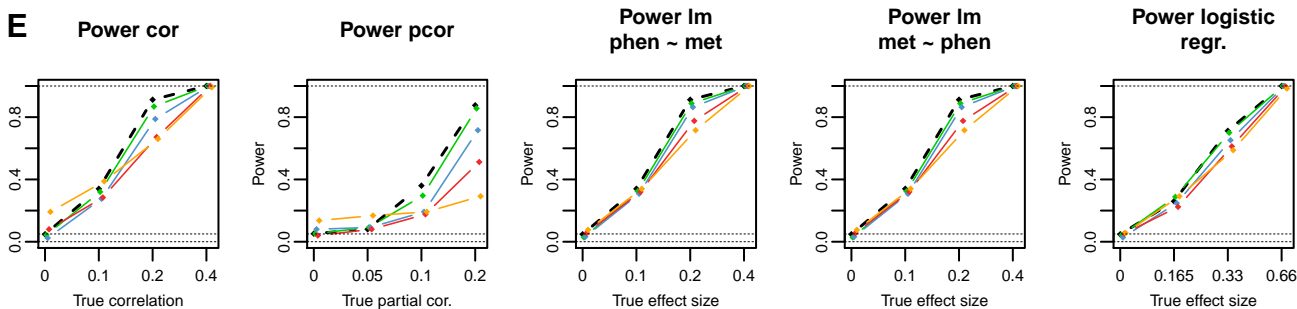
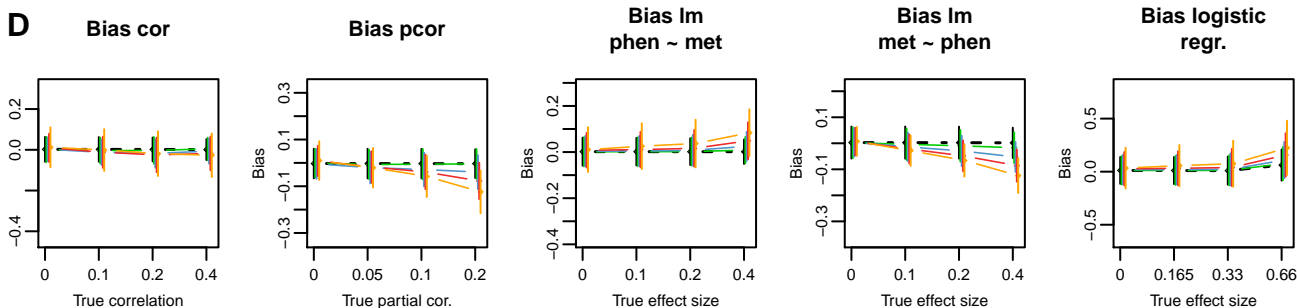
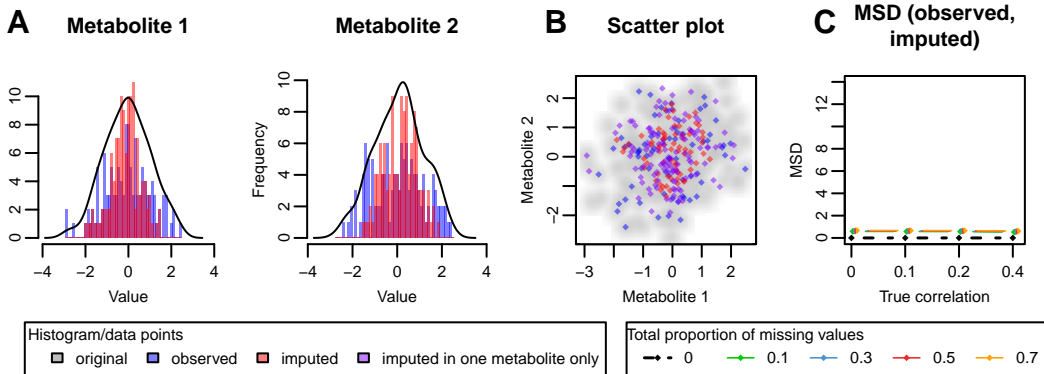


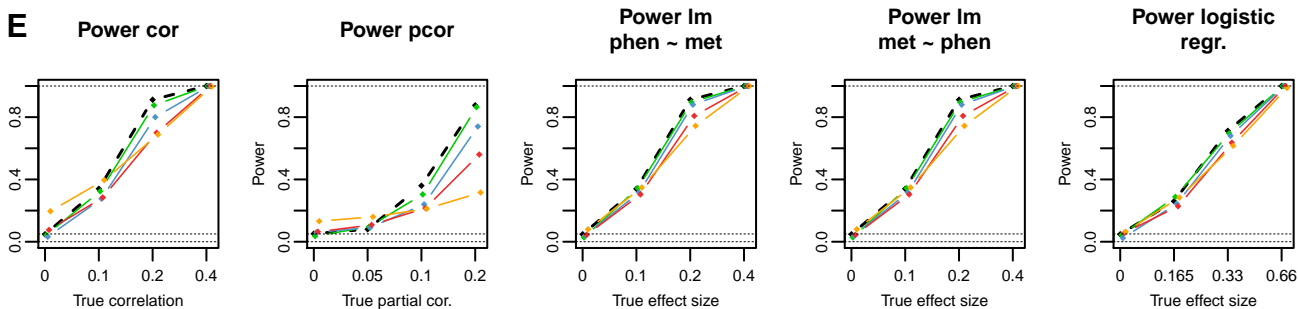
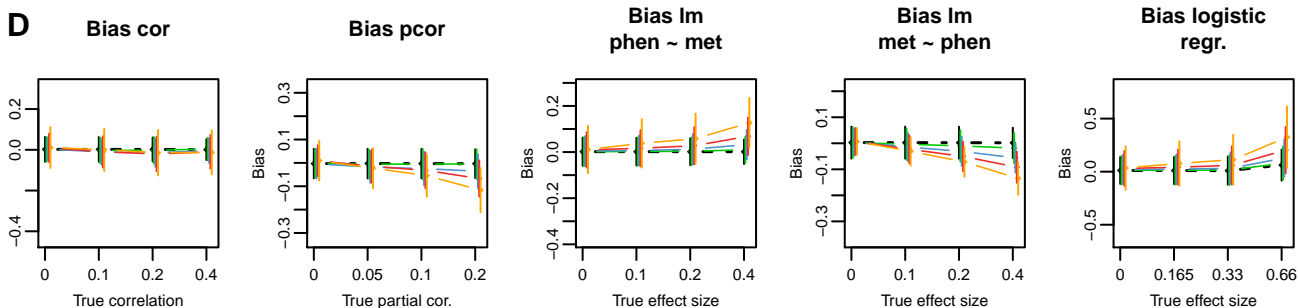
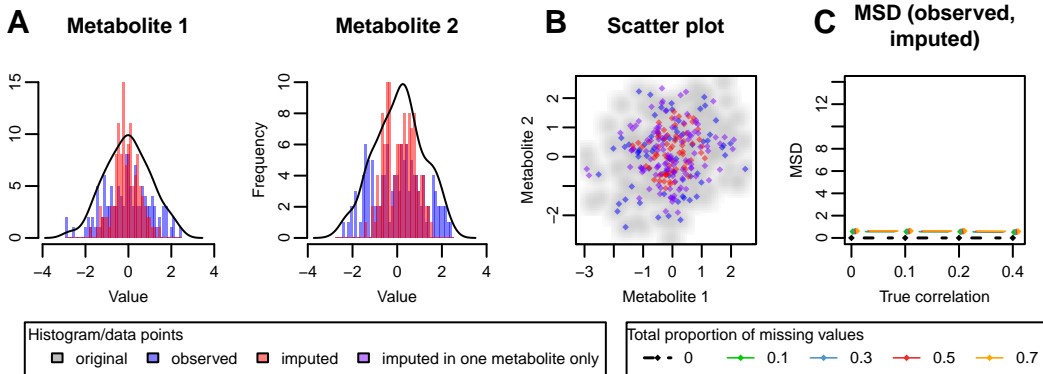


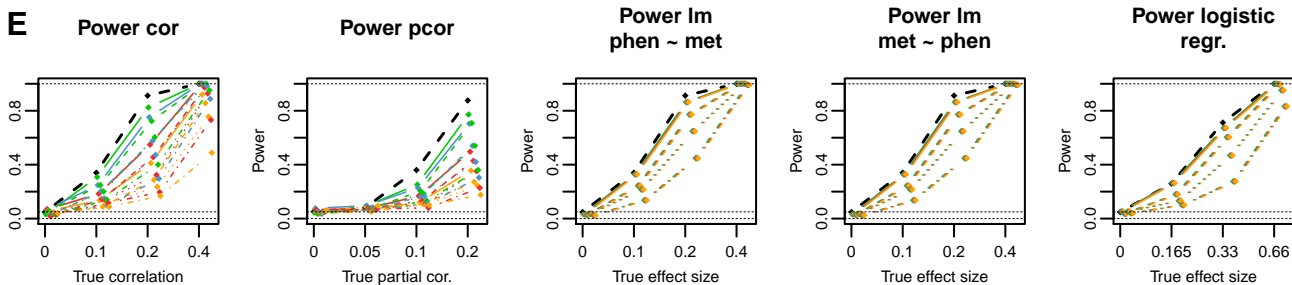
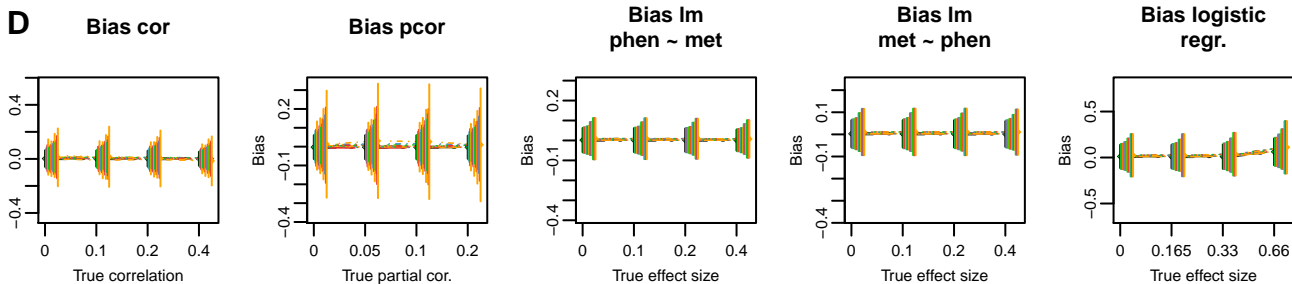
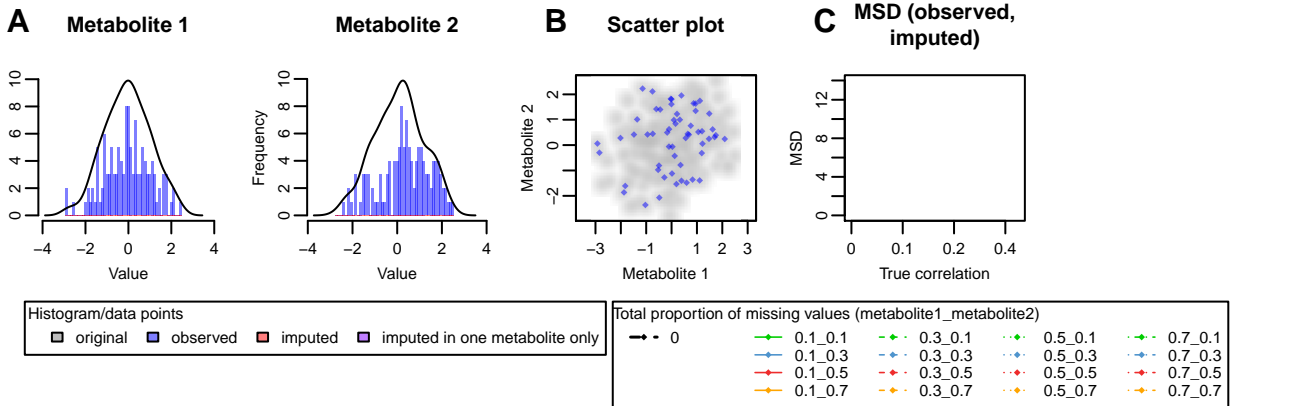




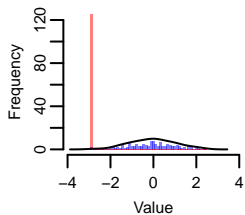




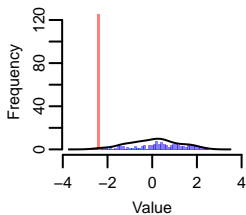




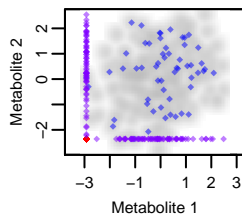
A Metabolite 1



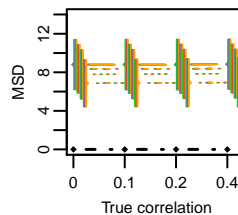
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



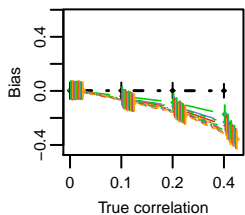
Histogram/data points

original observed imputed imputed in one metabolite only

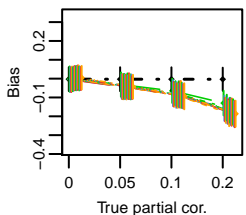
Total proportion of missing values (metabolite1_metabolite2)

- - 0
 - - 0.1_0.1
 - - 0.1_0.3
 - - 0.1_0.5
 - - 0.1_0.7
 - - 0.3_0.1
 - - 0.3_0.3
 - - 0.3_0.5
 - - 0.3_0.7
 - - 0.5_0.1
 - - 0.5_0.3
 - - 0.5_0.5
 - - 0.5_0.7
 - - 0.7_0.1
 - - 0.7_0.3
 - - 0.7_0.5
 - - 0.7_0.7

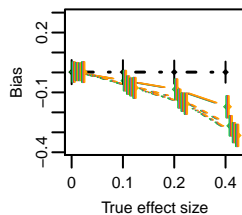
D Bias cor



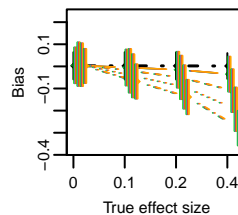
Bias pcor



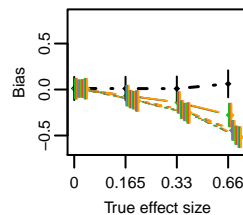
Bias Im phen ~ met



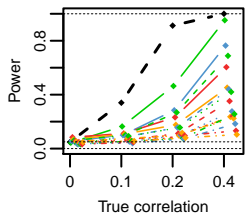
Bias Im met ~ phen



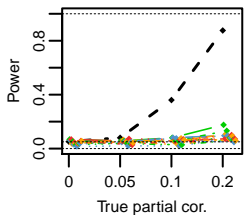
Bias logistic regr.



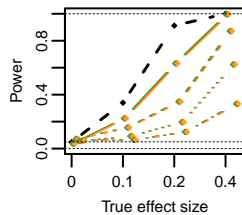
E Power cor



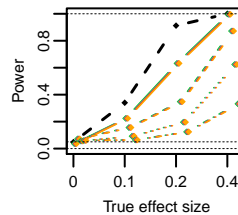
Power pcor



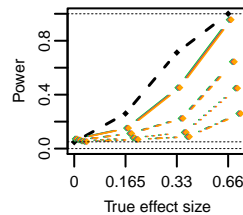
Power Im phen ~ met



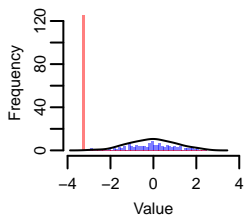
Power Im met ~ phen



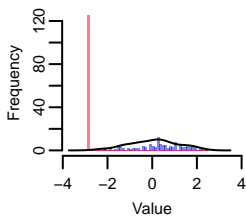
Power logistic regr.



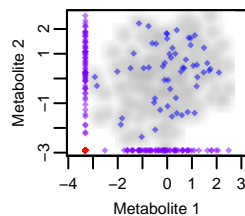
A Metabolite 1



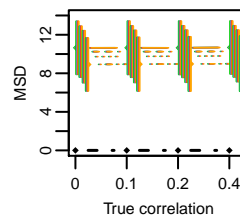
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



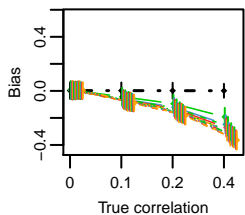
Histogram/data points

original observed imputed imputed in one metabolite only

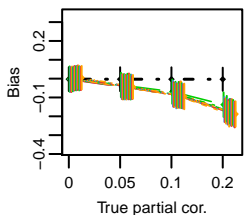
Total proportion of missing values (metabolite1_metabolite2)

0 0.1_0.1 0.3_0.1 0.5_0.1 0.7_0.1
 0.1_0.3 0.3_0.3 0.5_0.3 0.7_0.3
 0.1_0.5 0.3_0.5 0.5_0.5 0.7_0.5
 0.1_0.7 0.3_0.7 0.5_0.7 0.7_0.7

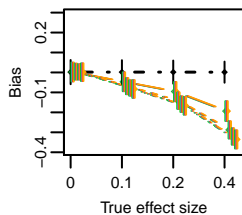
D Bias cor



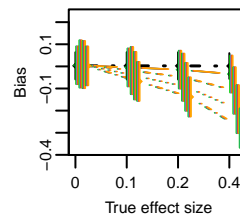
Bias pcor



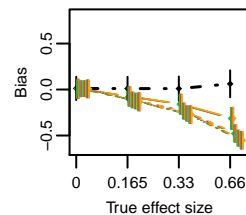
Bias Im phen ~ met



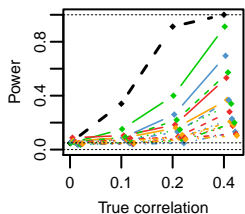
Bias Im met ~ phen



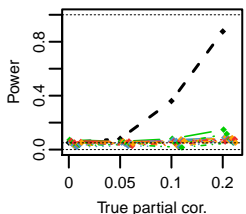
Bias logistic regr.



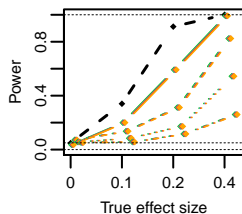
E Power cor



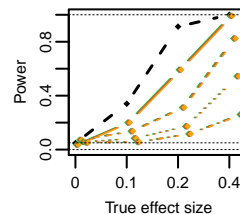
Power pcor



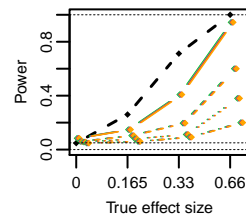
Power Im phen ~ met

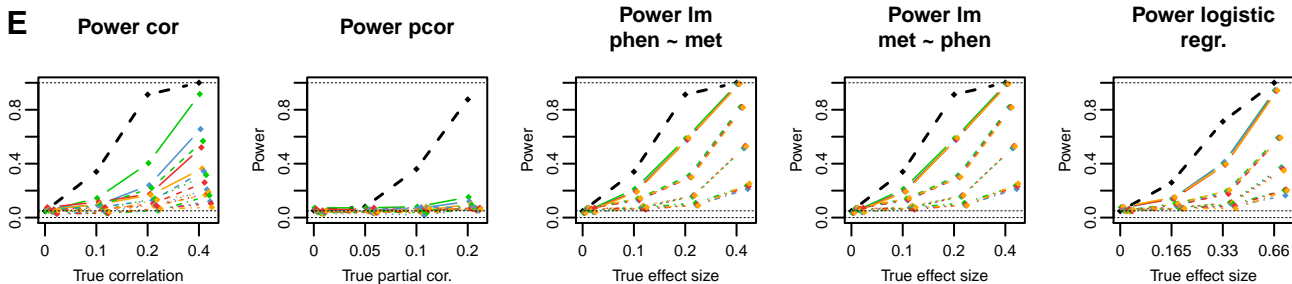
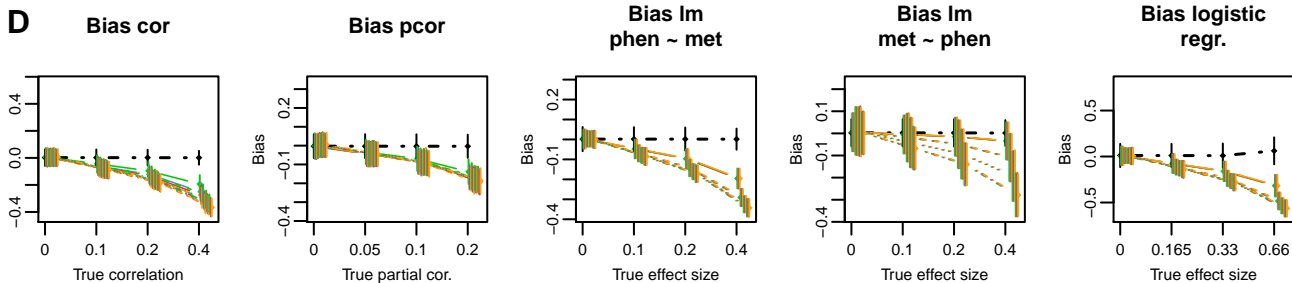
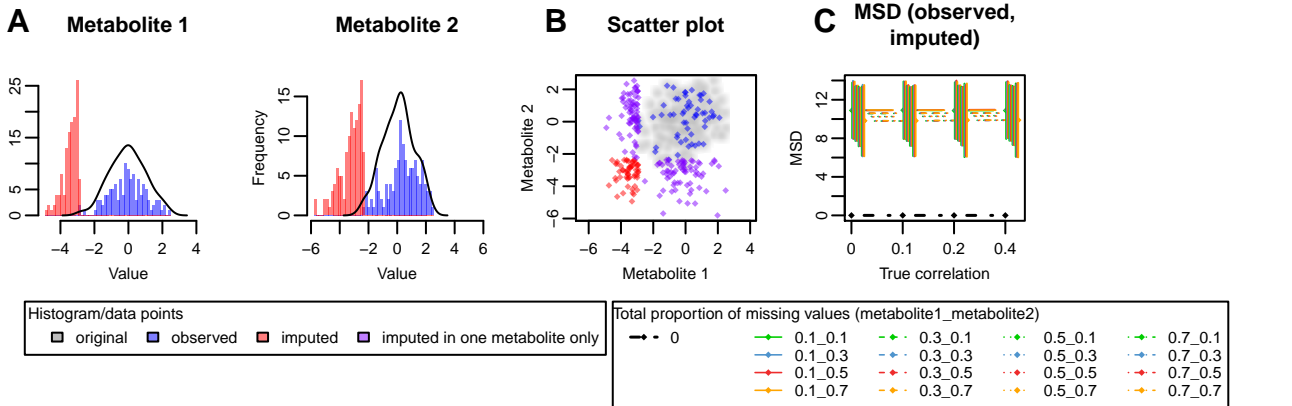


Power Im met ~ phen

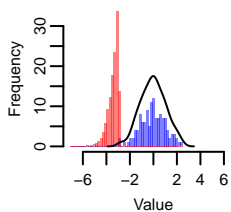


Power logistic regr.

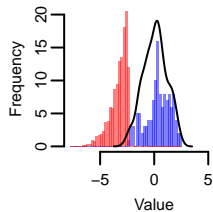




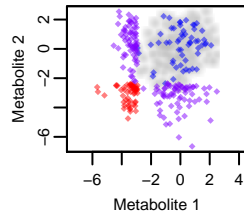
A Metabolite 1



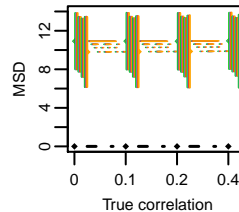
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



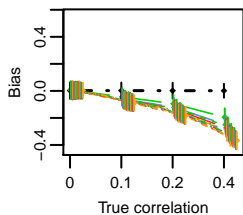
Histogram/data points

original observed imputed imputed in one metabolite only

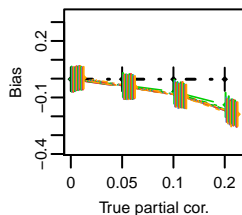
Total proportion of missing values (metabolite1-metabolite2)

0 0.1_0.1 0.1_0.3 0.1_0.5 0.1_0.7 0.3_0.1 0.3_0.3 0.3_0.5 0.3_0.7 0.5_0.1 0.5_0.3 0.5_0.5 0.5_0.7 0.7_0.1 0.7_0.3 0.7_0.5 0.7_0.7

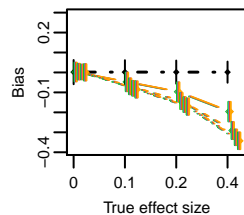
D Bias cor



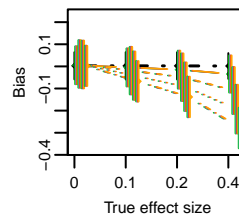
Bias pcor



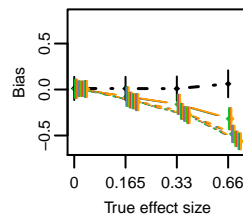
Bias Im phen ~ met



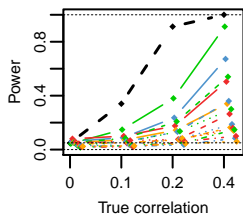
Bias Im met ~ phen



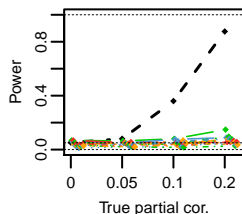
Bias logistic regr.



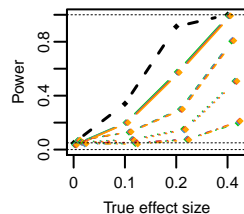
E Power cor



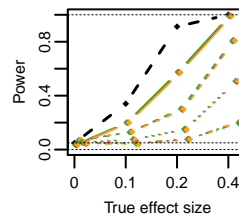
Power pcor



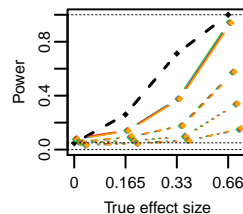
Power Im phen ~ met

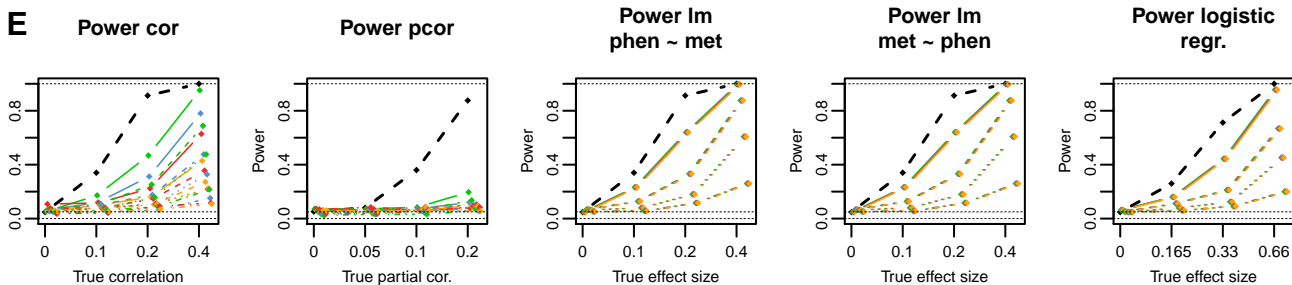
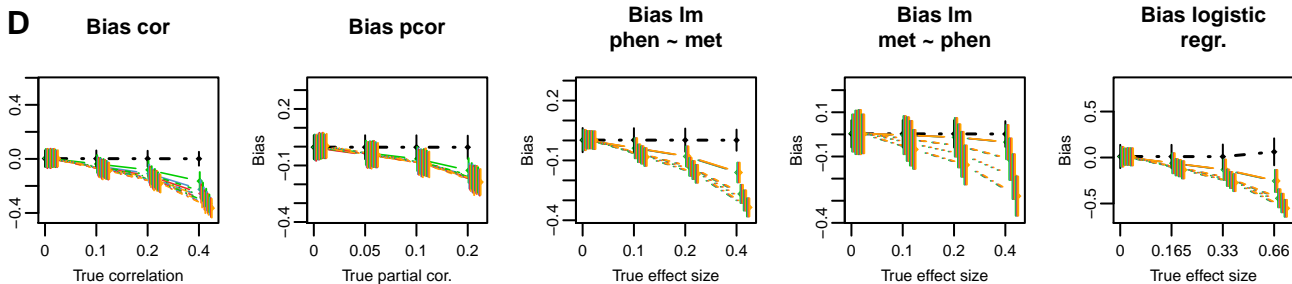
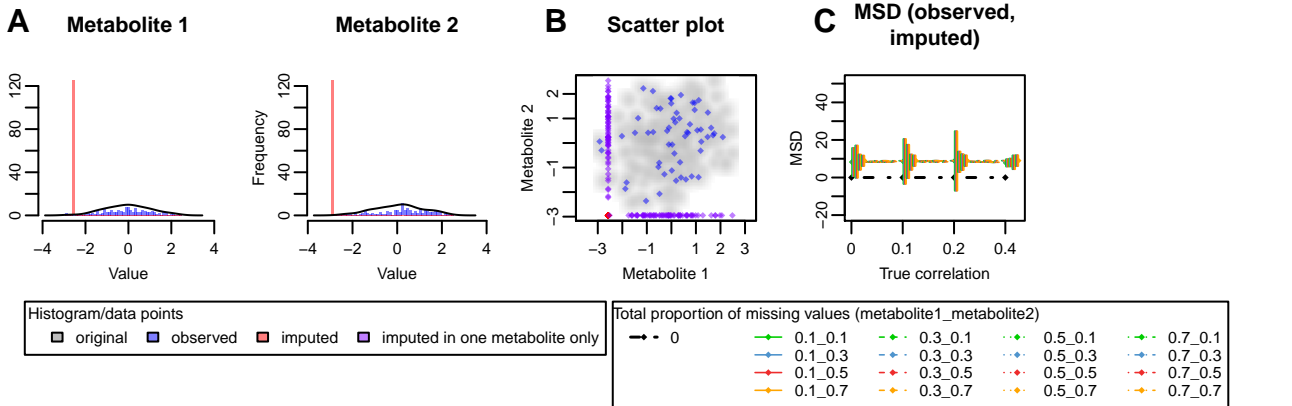


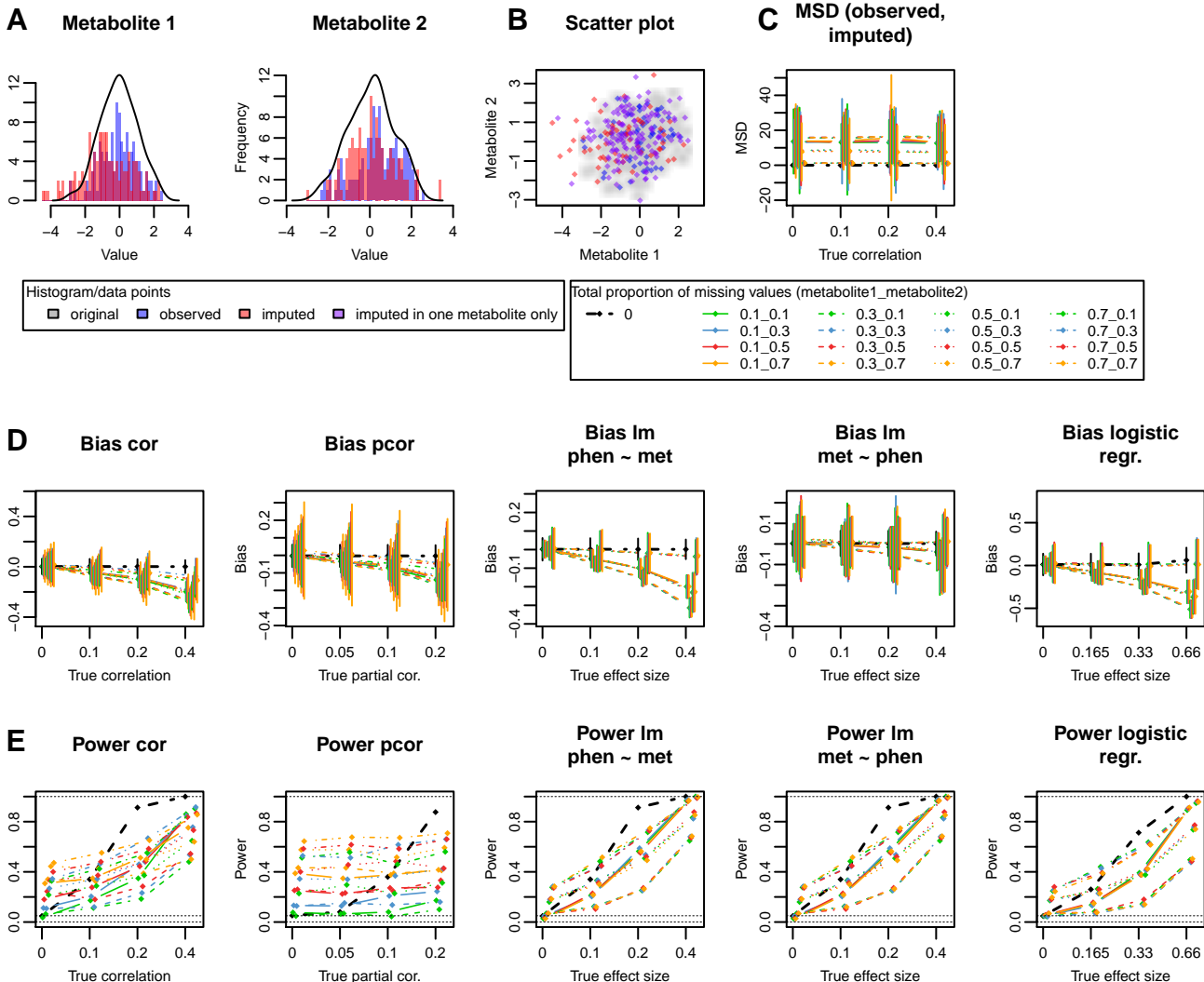
Power Im met ~ phen

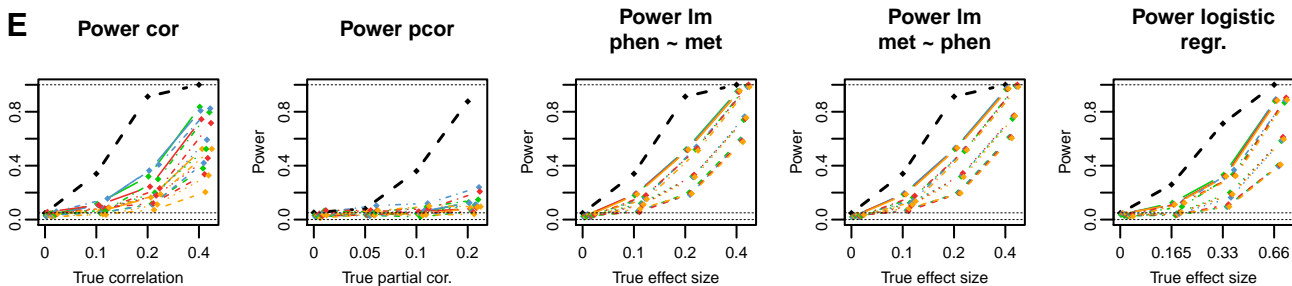
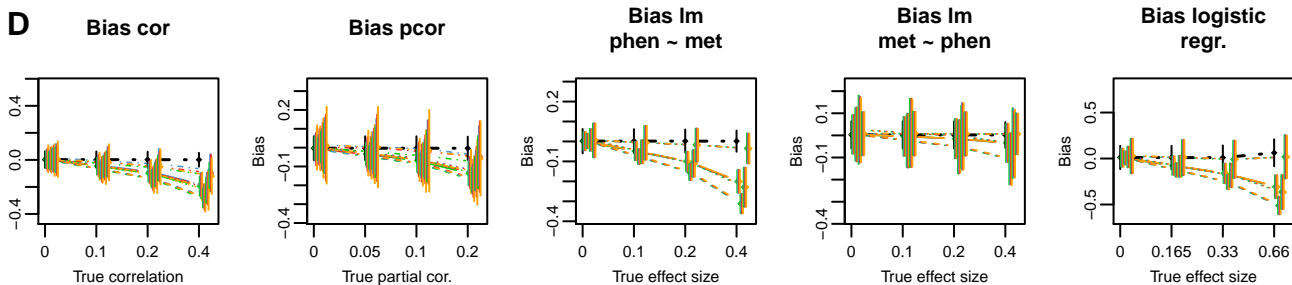
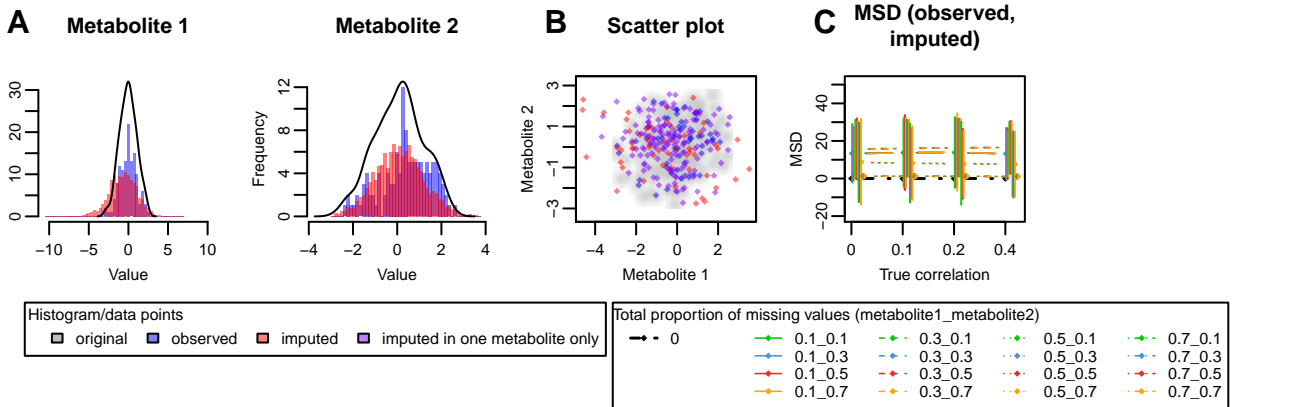


Power logistic regr.

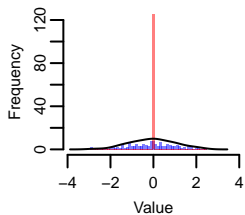




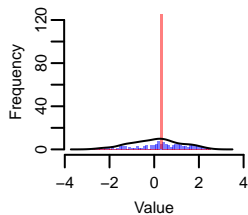




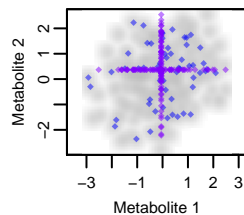
A Metabolite 1



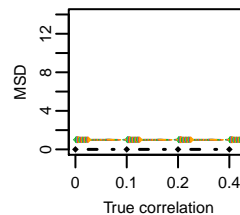
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



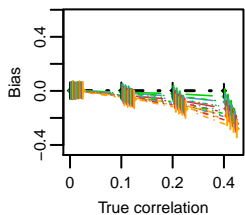
Histogram/data points

original observed imputed imputed in one metabolite only

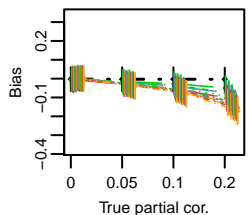
Total proportion of missing values (metabolite1_metabolite2)

- - 0
 0.1_0.1 0.3_0.1 0.5_0.1 0.7_0.1
 0.1_0.3 0.3_0.3 0.5_0.3 0.7_0.3
 0.1_0.5 0.3_0.5 0.5_0.5 0.7_0.5
 0.1_0.7 0.3_0.7 0.5_0.7 0.7_0.7

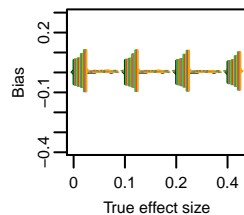
D Bias cor



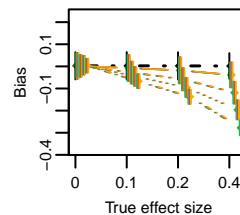
Bias pcor



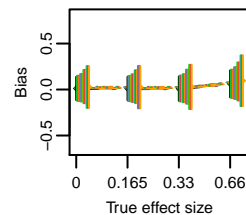
Bias Im phen ~ met



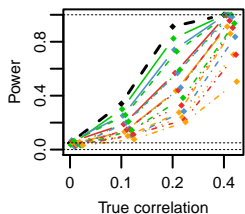
Bias Im met ~ phen



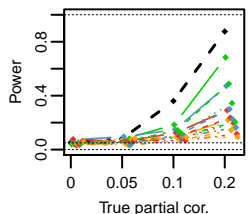
Bias logistic regr.



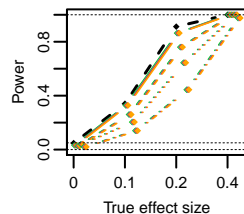
E Power cor



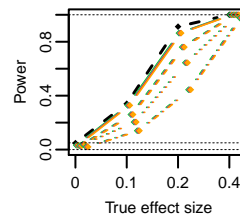
Power pcor



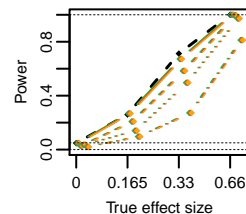
Power Im phen ~ met



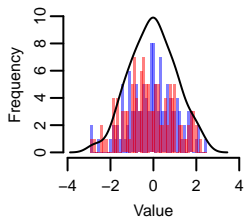
Power Im met ~ phen



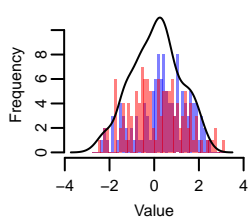
Power logistic regr.



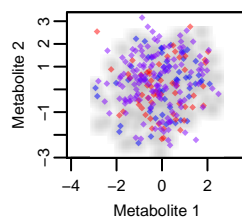
A Metabolite 1



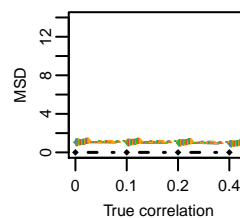
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



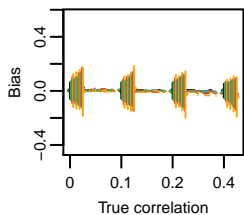
Histogram/data points

original observed imputed imputed in one metabolite only

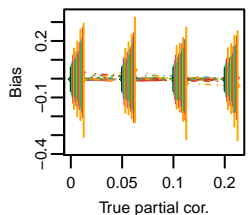
Total proportion of missing values (metabolite1_metabolite2)

- - 0
 0.1_0.1 0.1_0.3 0.1_0.5 0.1_0.7
 0.3_0.1 0.3_0.3 0.3_0.5 0.3_0.7
 0.5_0.1 0.5_0.3 0.5_0.5 0.5_0.7
 0.7_0.1 0.7_0.3 0.7_0.5 0.7_0.7

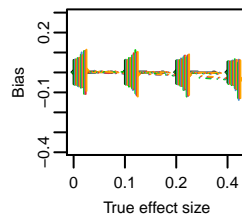
D Bias cor



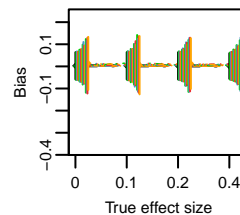
Bias pcor



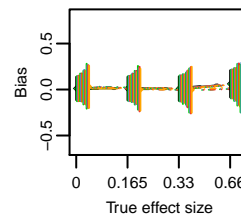
Bias Im phen ~ met



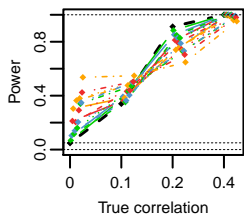
Bias Im met ~ phen



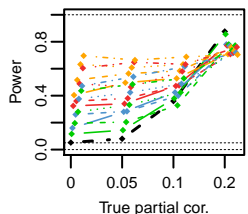
Bias logistic regr.



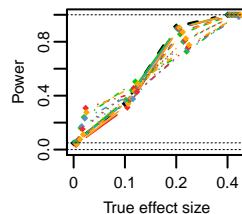
E Power cor



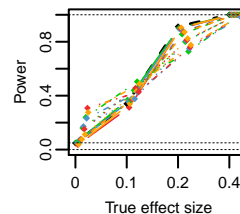
Power pcor



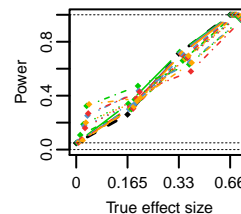
Power Im phen ~ met



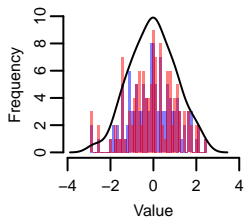
Power Im met ~ phen



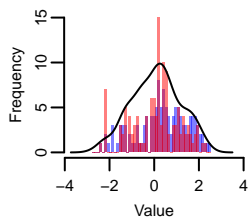
Power logistic regr.



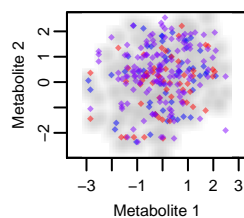
A Metabolite 1



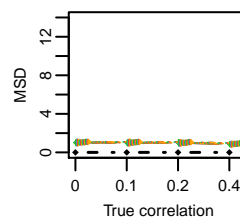
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



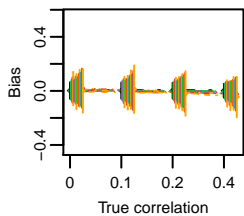
Histogram/data points

original observed imputed imputed in one metabolite only

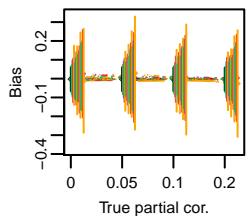
Total proportion of missing values (metabolite1_metabolite2)

0 0.1_0.1 0.1_0.3 0.1_0.5 0.1_0.7 0.3_0.1 0.3_0.3 0.3_0.5 0.3_0.7 0.5_0.1 0.5_0.3 0.5_0.5 0.5_0.7 0.7_0.1 0.7_0.3 0.7_0.5 0.7_0.7

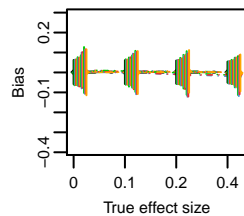
D Bias cor



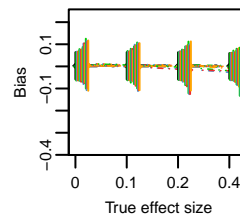
Bias pcor



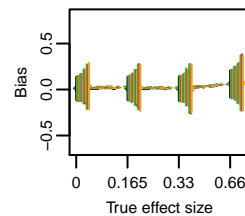
Bias Im phen ~ met



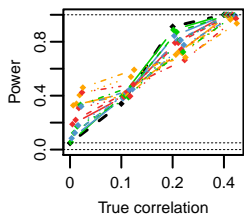
Bias Im met ~ phen



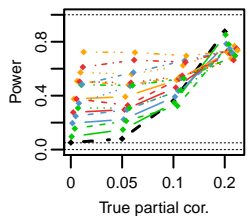
Bias logistic regr.



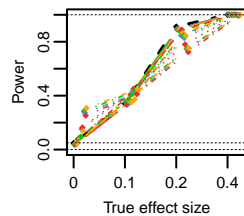
E Power cor



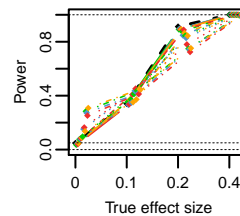
Power pcor



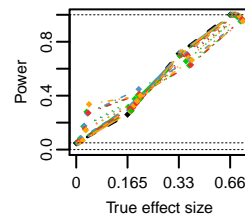
Power Im phen ~ met



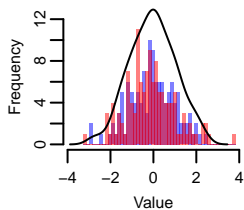
Power Im met ~ phen



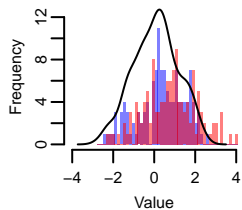
Power logistic regr.



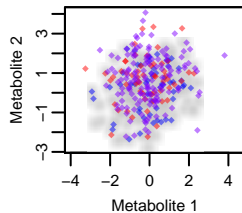
A Metabolite 1



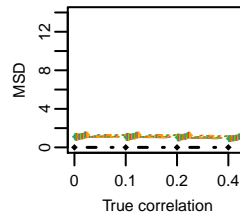
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



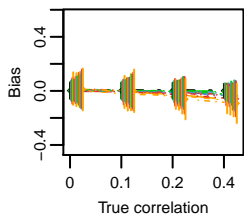
Histogram/data points

original observed imputed imputed in one metabolite only

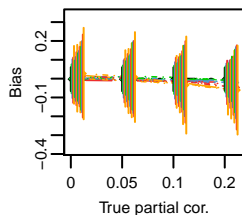
Total proportion of missing values (metabolite1-metabolite2)

0 0.1_0.1 0.3_0.1 0.5_0.1 0.7_0.1
 0.1_0.3 0.3_0.3 0.5_0.3 0.7_0.3
 0.1_0.5 0.3_0.5 0.5_0.5 0.7_0.5
 0.1_0.7 0.3_0.7 0.5_0.7 0.7_0.7

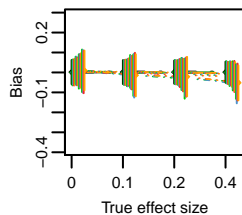
D Bias cor



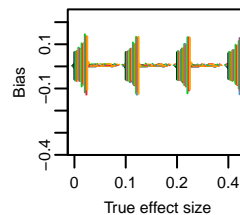
Bias pcor



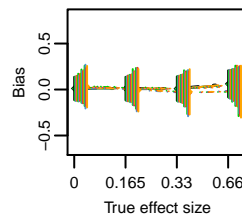
Bias Im phen ~ met



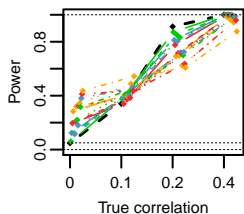
Bias Im met ~ phen



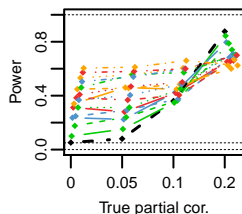
Bias logistic regr.



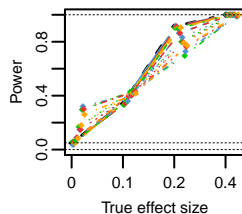
E Power cor



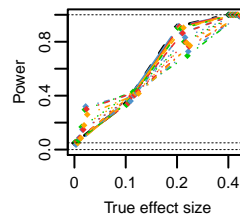
Power pcor



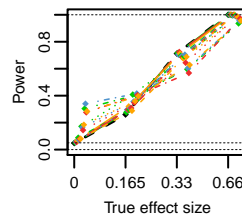
Power Im phen ~ met



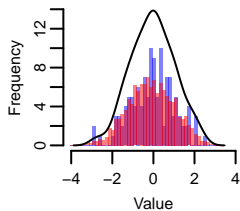
Power Im met ~ phen



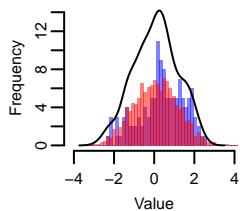
Power logistic regr.



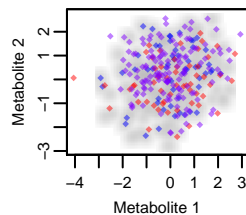
A Metabolite 1



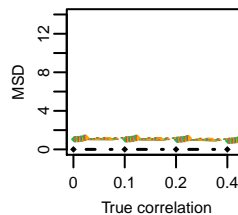
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



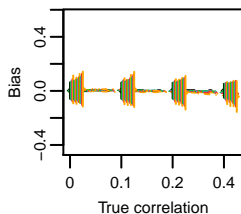
Histogram/data points

original observed imputed imputed in one metabolite only

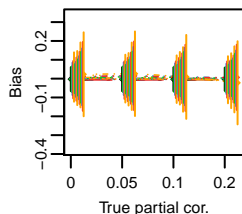
Total proportion of missing values (metabolite1-metabolite2)

0 0.1_0.1 0.3_0.1 0.5_0.1 0.7_0.1
 0.1_0.3 0.3_0.3 0.5_0.3 0.7_0.3
 0.1_0.5 0.3_0.5 0.5_0.5 0.7_0.5
 0.1_0.7 0.3_0.7 0.5_0.7 0.7_0.7

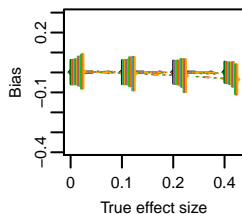
D Bias cor



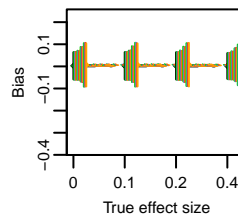
Bias pcor



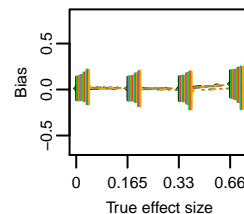
Bias Im phen ~ met



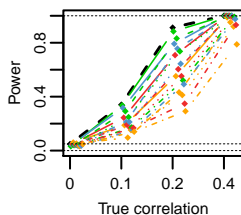
Bias Im met ~ phen



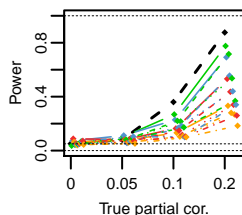
Bias logistic regr.



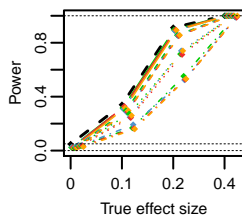
E Power cor



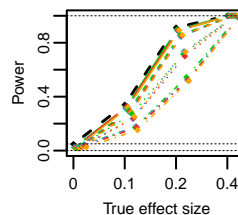
Power pcor



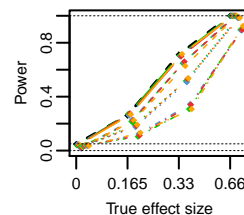
Power Im phen ~ met



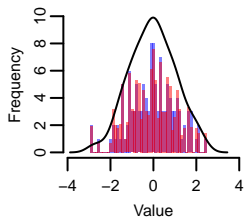
Power Im met ~ phen



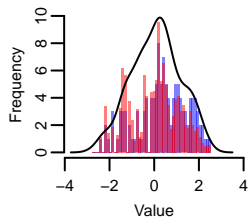
Power logistic regr.



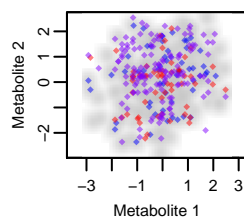
A Metabolite 1



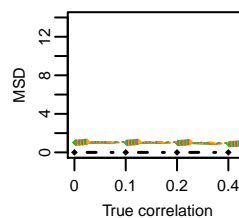
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



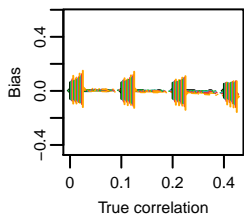
Histogram/data points

original observed imputed imputed in one metabolite only

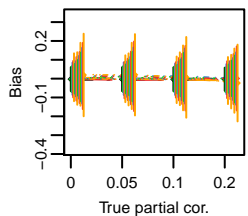
Total proportion of missing values (metabolite1-metabolite2)

0 0.1_0.1 0.1_0.3 0.1_0.5 0.1_0.7 0.3_0.1 0.3_0.3 0.3_0.5 0.3_0.7 0.5_0.1 0.5_0.3 0.5_0.5 0.5_0.7 0.7_0.1 0.7_0.3 0.7_0.5 0.7_0.7

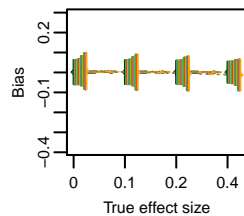
D Bias cor



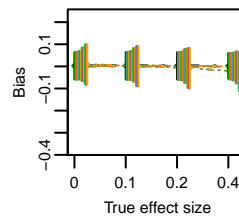
Bias pcor



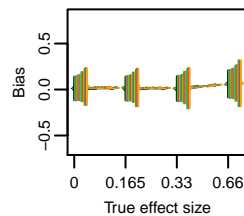
Bias Im phen ~ met



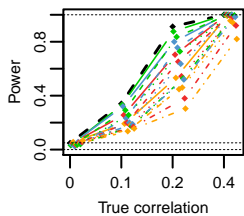
Bias Im met ~ phen



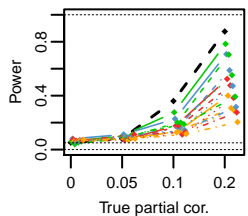
Bias logistic regr.



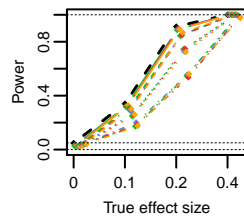
E Power cor



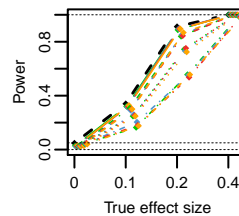
Power pcor



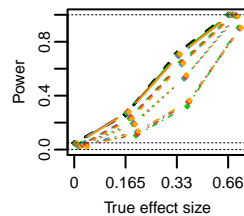
Power Im phen ~ met

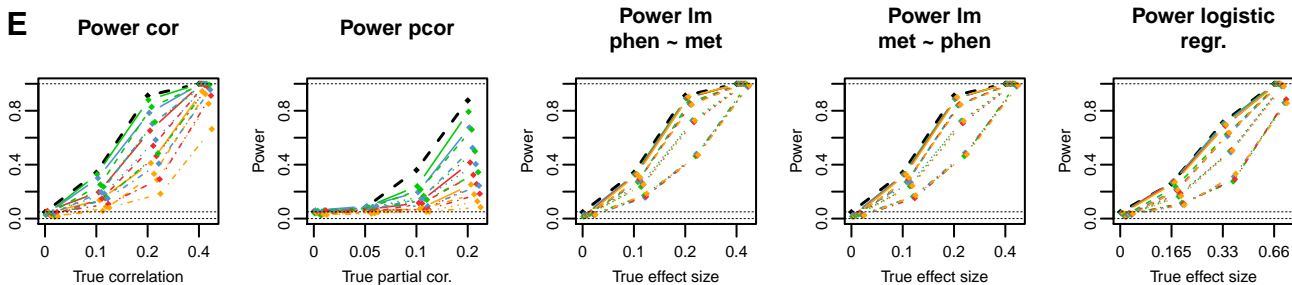
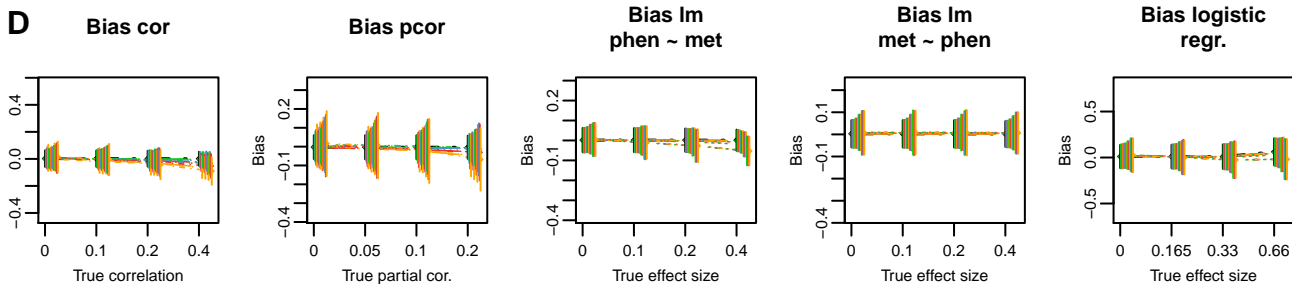
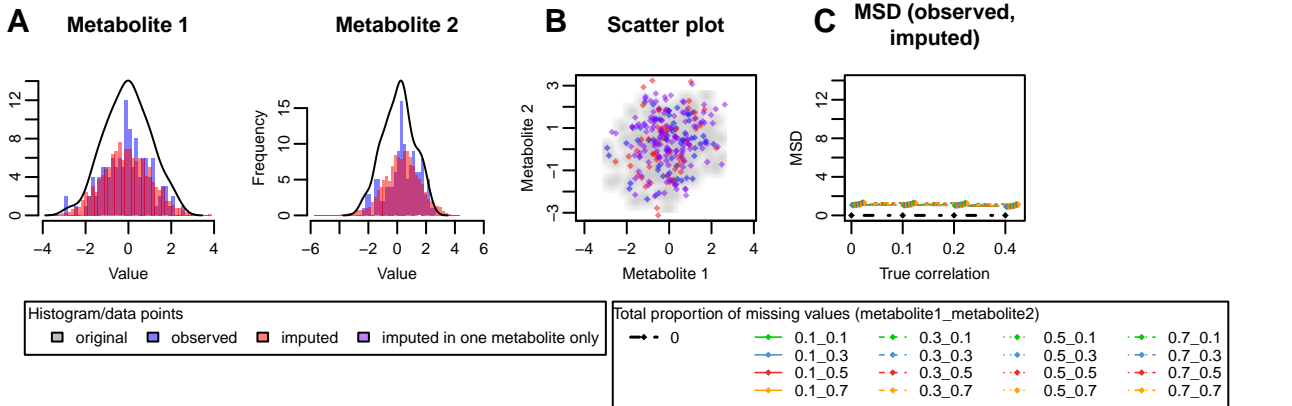


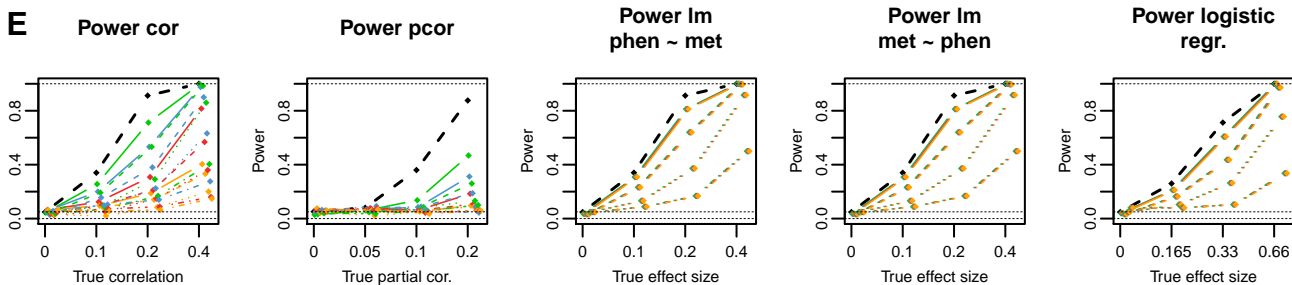
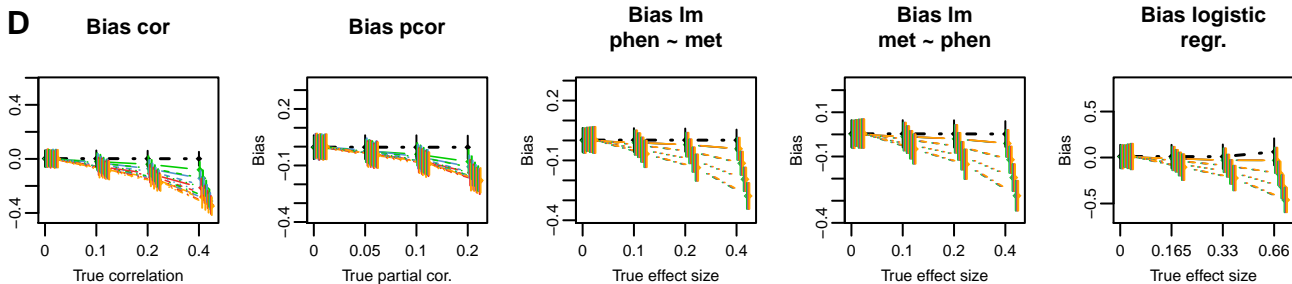
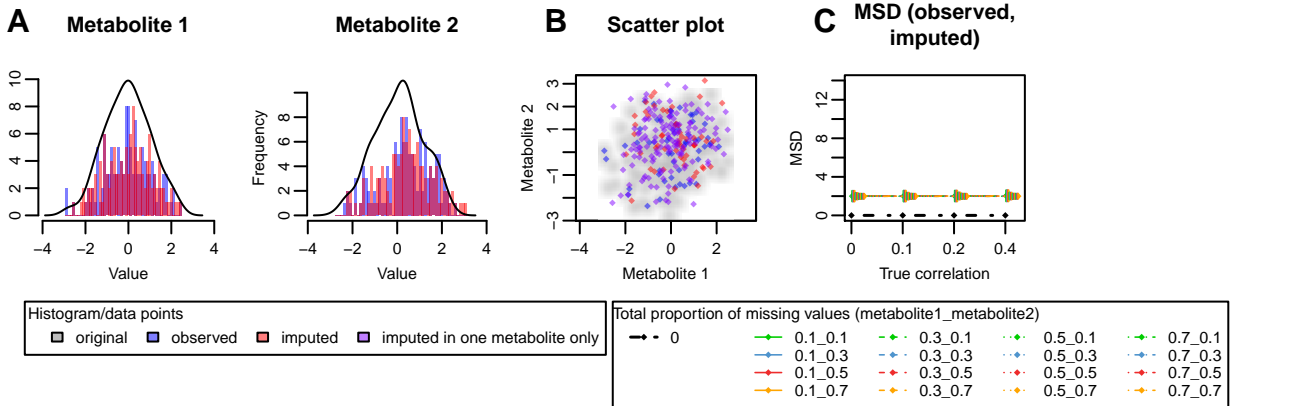
Power Im met ~ phen



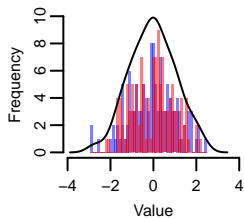
Power logistic regr.



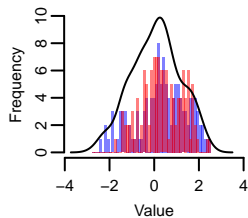




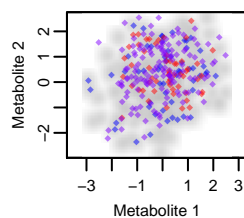
A Metabolite 1



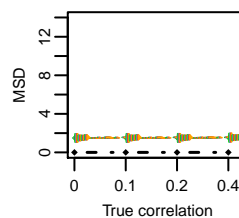
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



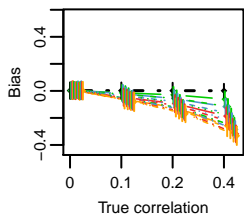
Histogram/data points

original observed imputed imputed in one metabolite only

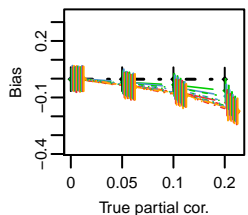
Total proportion of missing values (metabolite1-metabolite2)

0 0.1_0.1 0.1_0.3 0.1_0.5 0.1_0.7 0.3_0.1 0.3_0.3 0.3_0.5 0.3_0.7 0.5_0.1 0.5_0.3 0.5_0.5 0.5_0.7 0.7_0.1 0.7_0.3 0.7_0.5 0.7_0.7

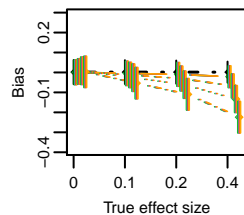
D Bias cor



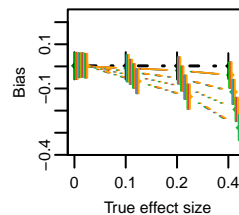
Bias pcor



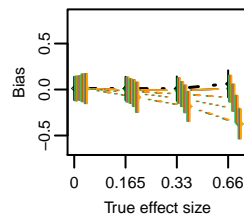
Bias Im phen ~ met



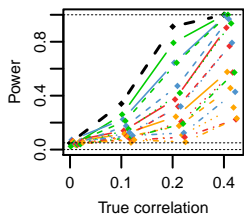
Bias Im met ~ phen



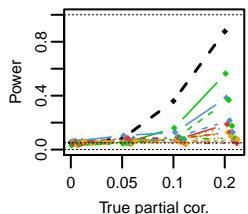
Bias logistic regr.



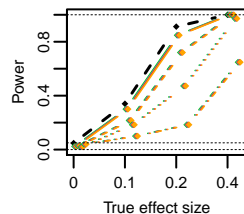
E Power cor



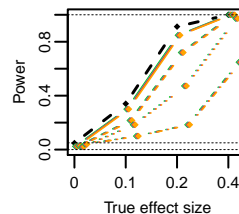
Power pcor



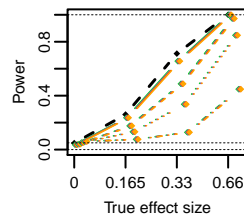
Power Im phen ~ met

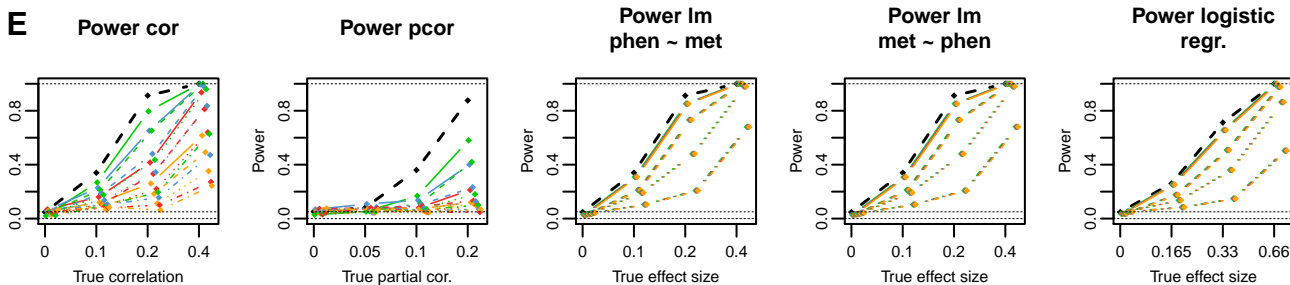
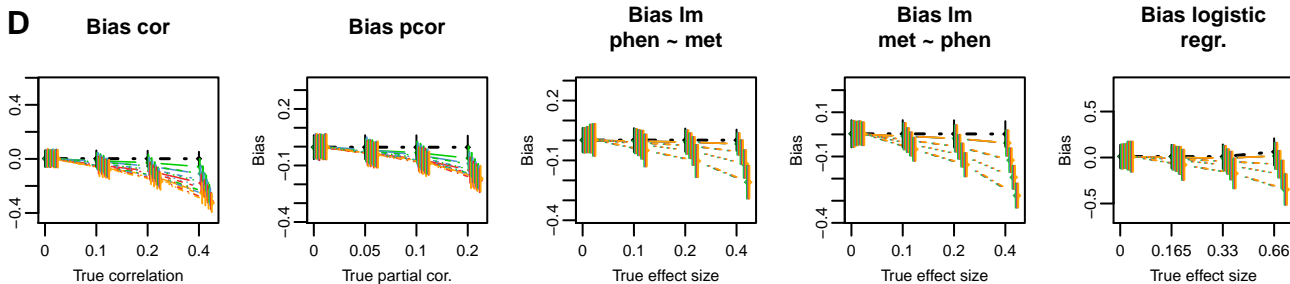
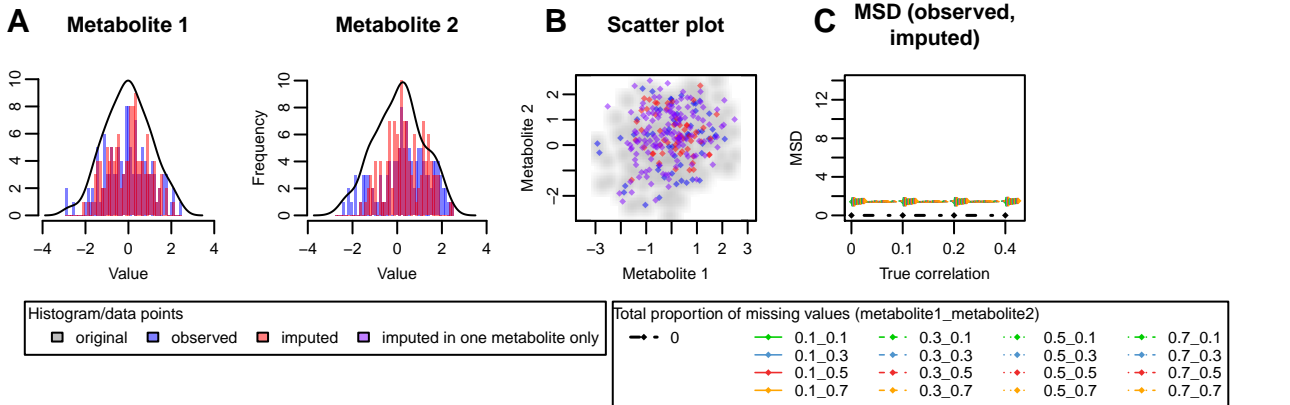


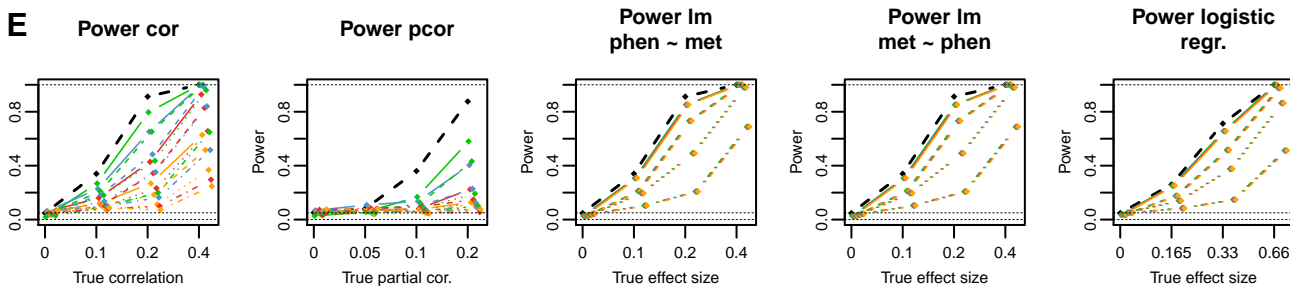
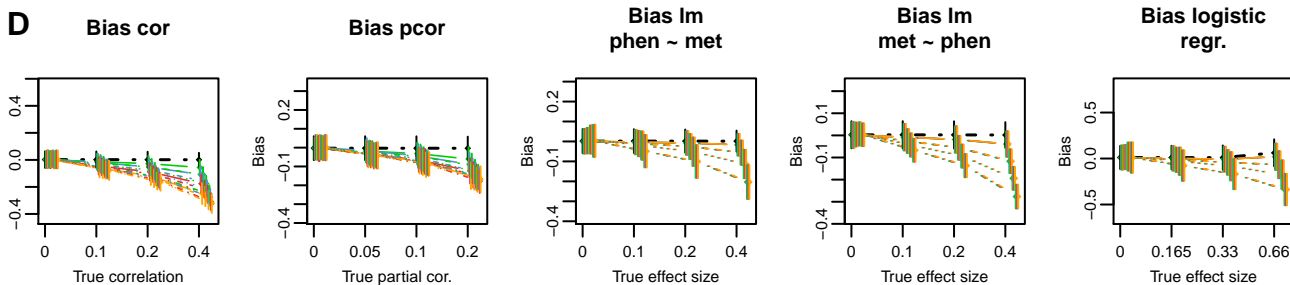
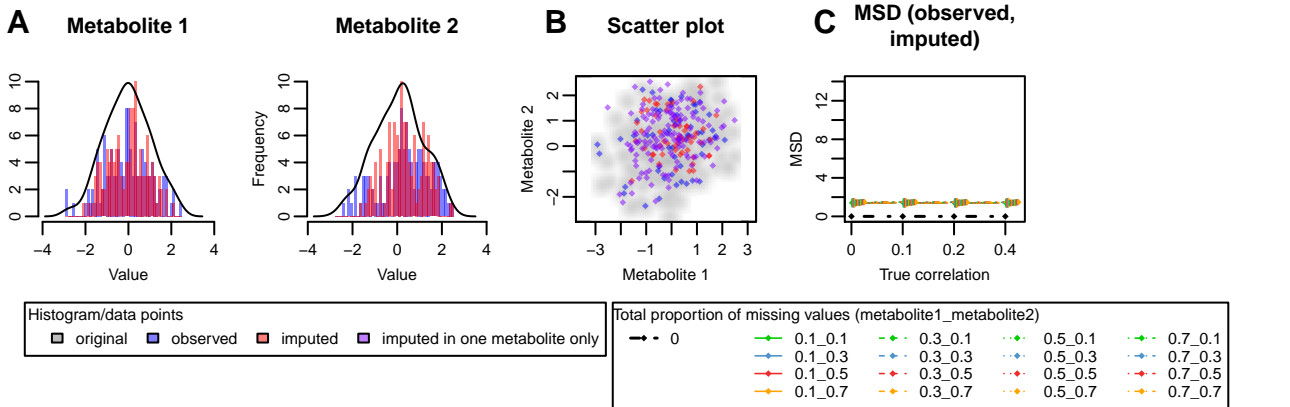
Power Im met ~ phen

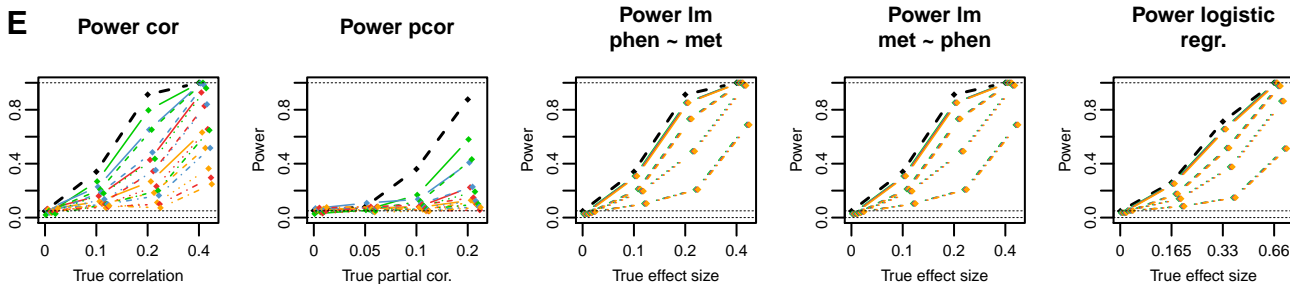
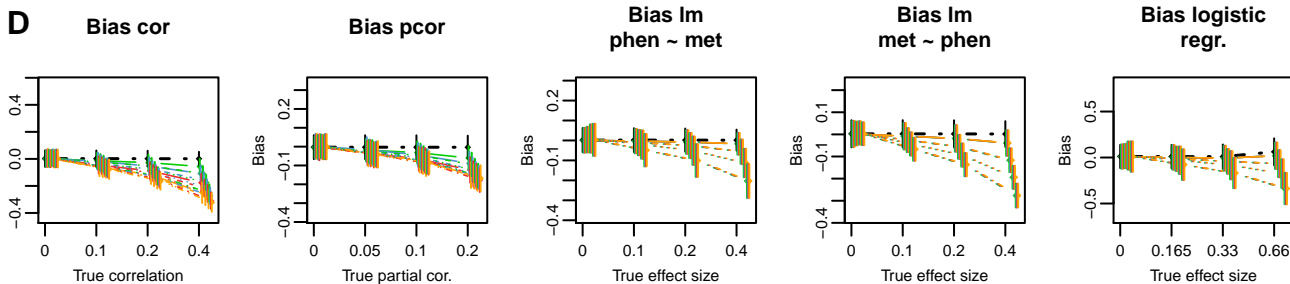
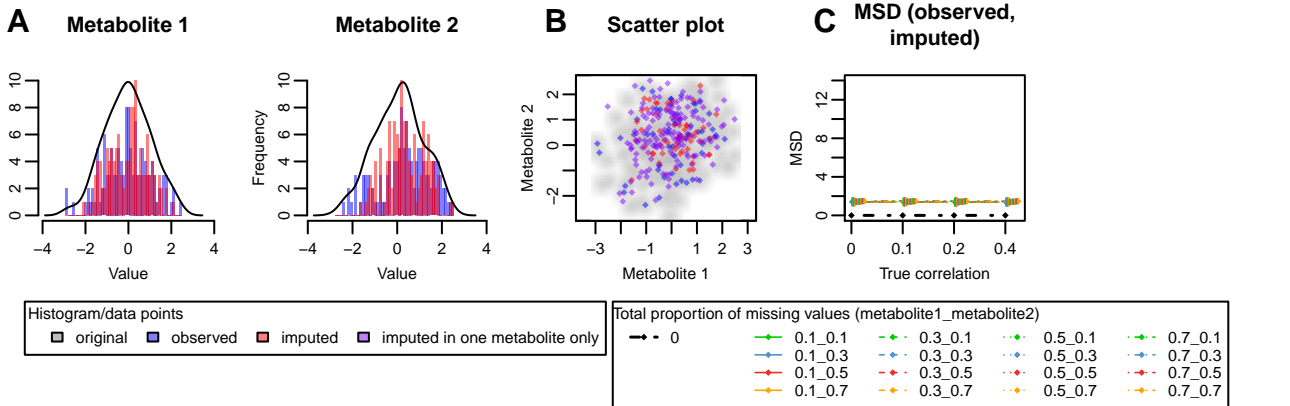


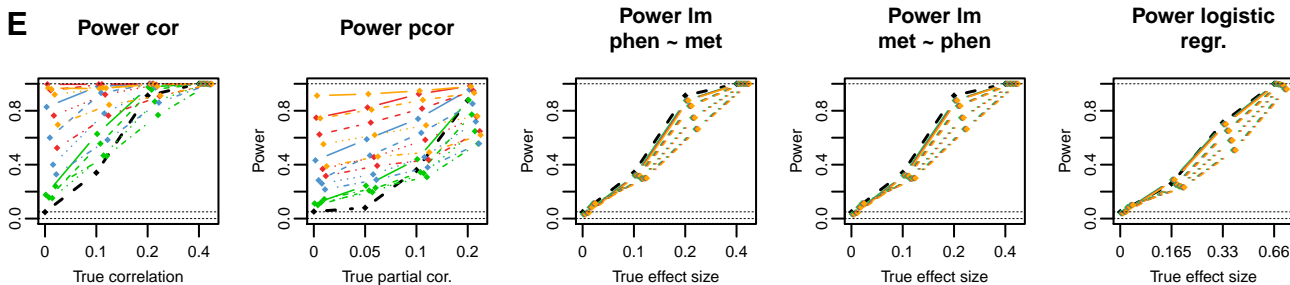
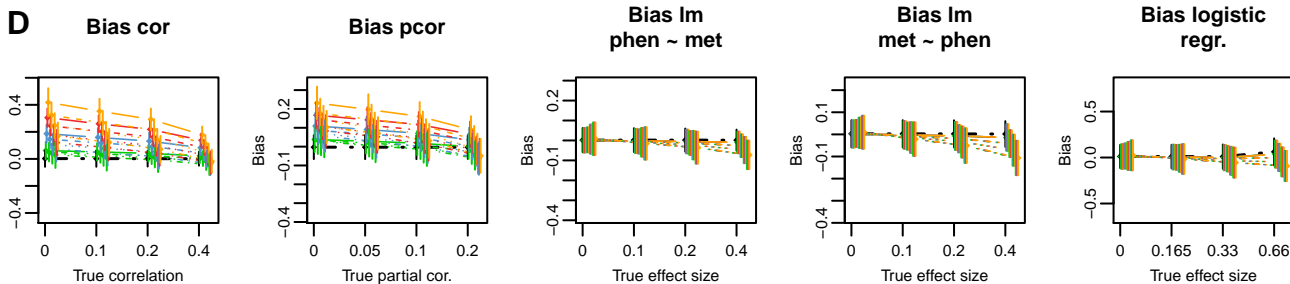
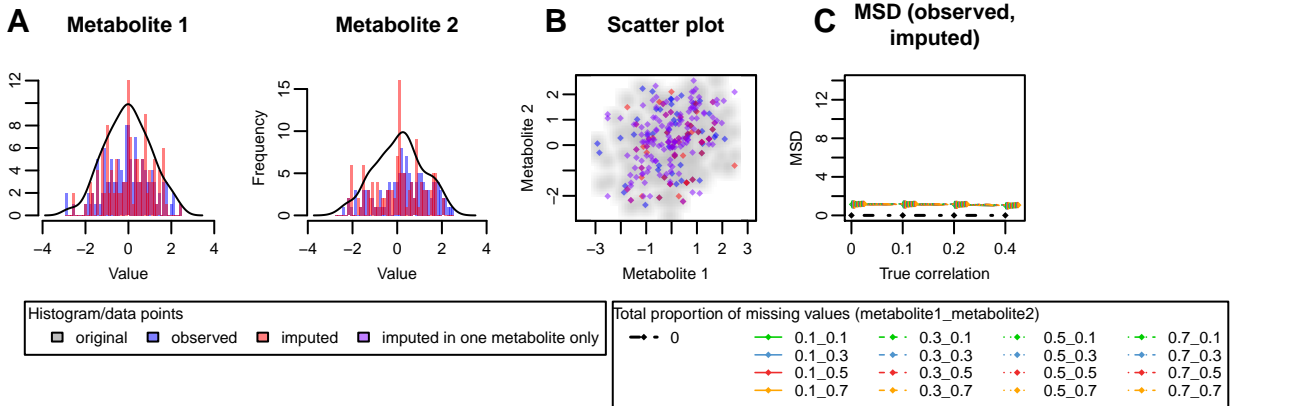
Power logistic regr.



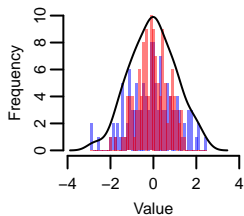




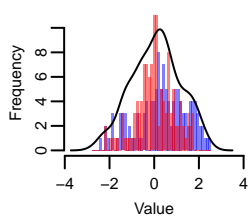




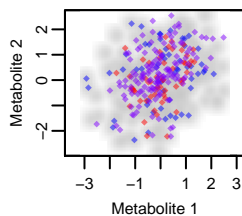
A Metabolite 1



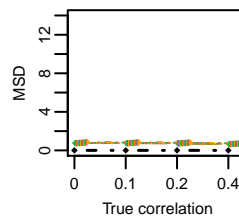
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



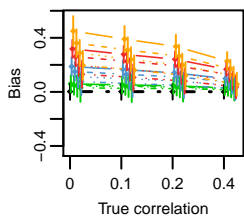
Histogram/data points

original observed imputed imputed in one metabolite only

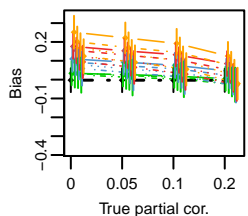
Total proportion of missing values (metabolite1-metabolite2)

- - 0
 0.1_0.1 0.1_0.3 0.1_0.5 0.1_0.7
 0.3_0.1 0.3_0.3 0.3_0.5 0.3_0.7
 0.5_0.1 0.5_0.3 0.5_0.5 0.5_0.7
 0.7_0.1 0.7_0.3 0.7_0.5 0.7_0.7

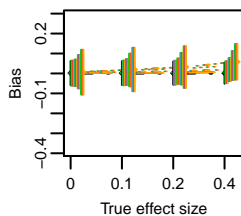
D Bias cor



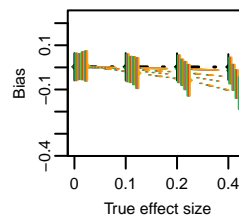
Bias pcor



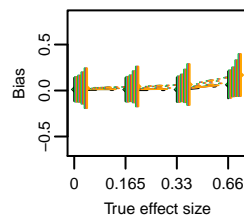
Bias Im phen ~ met



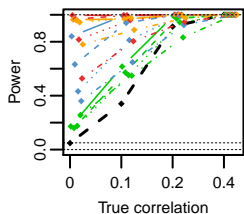
Bias Im met ~ phen



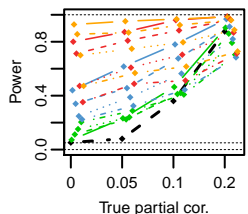
Bias logistic regr.



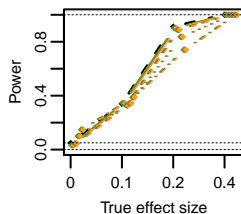
E Power cor



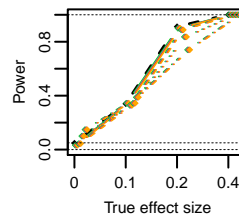
Power pcor



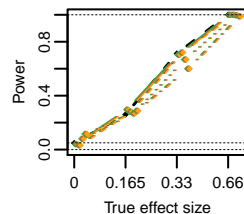
Power Im phen ~ met

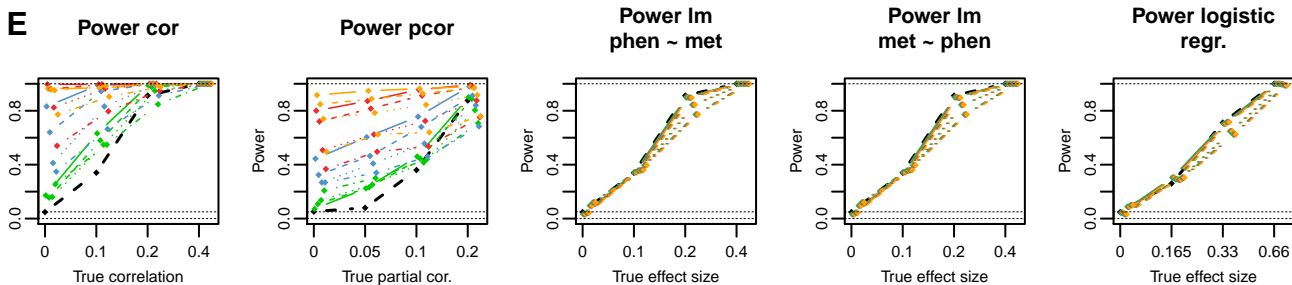
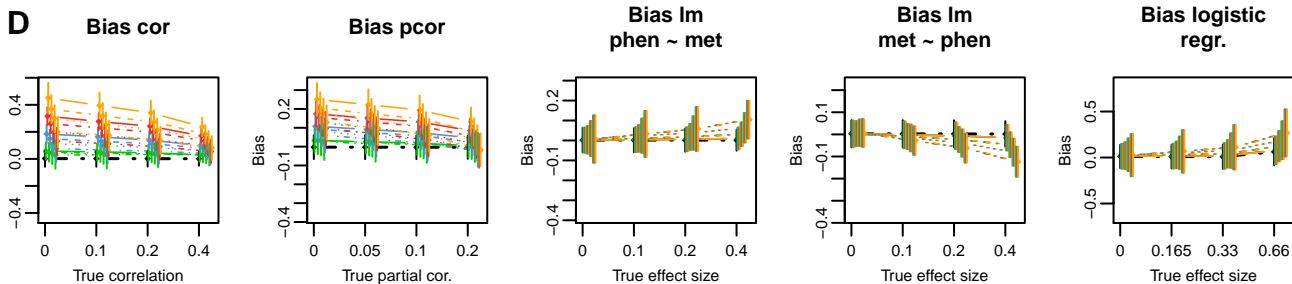
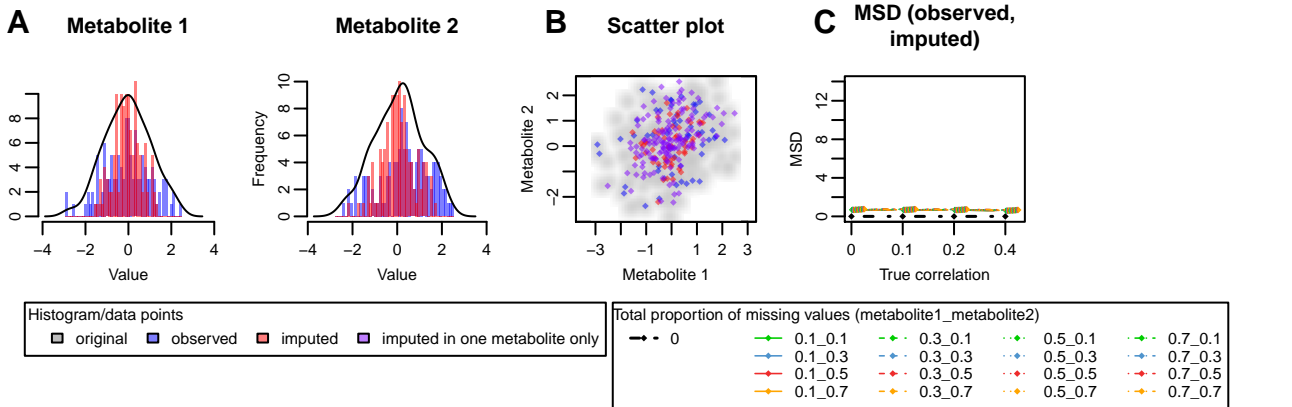


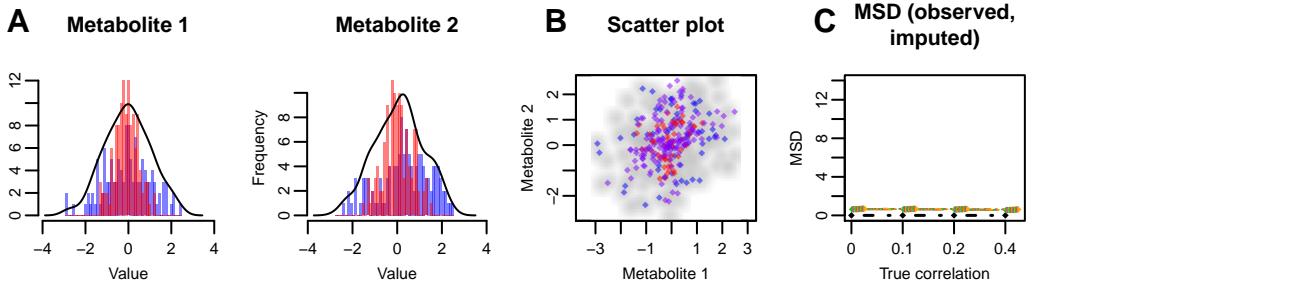
Power Im met ~ phen



Power logistic regr.





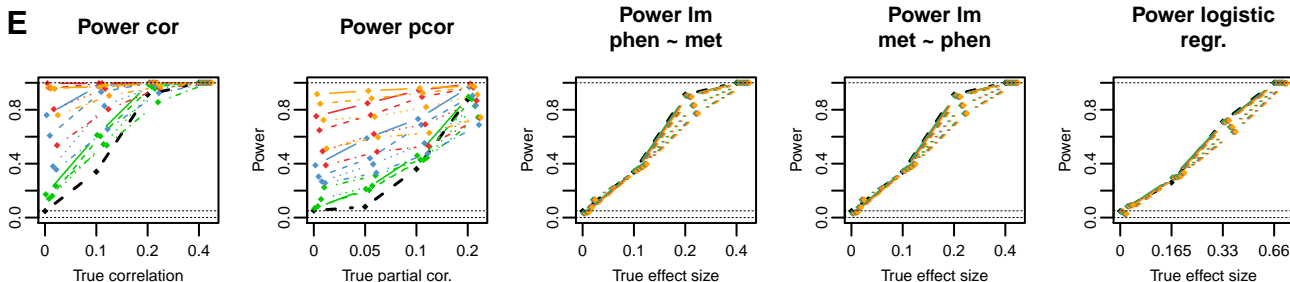
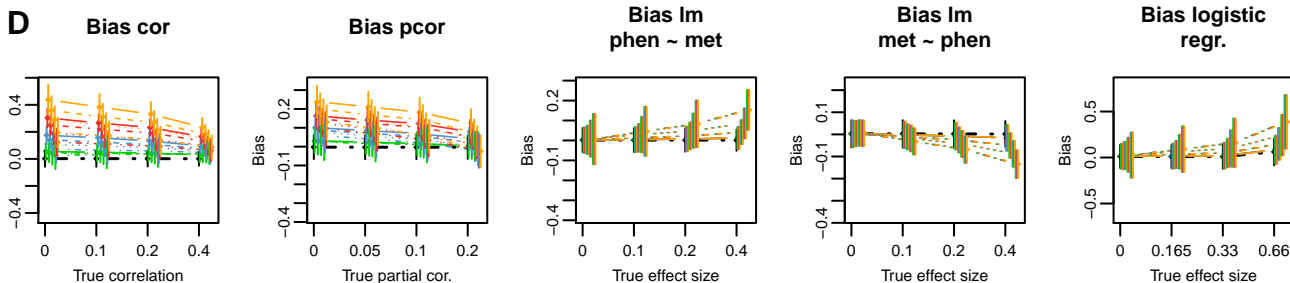


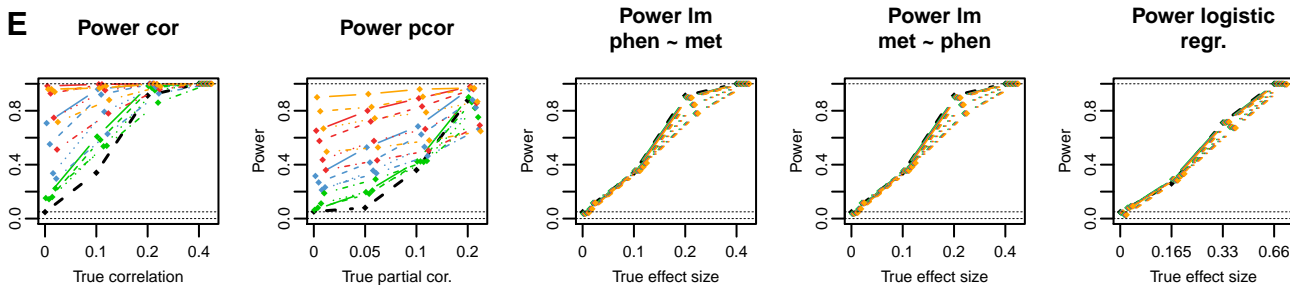
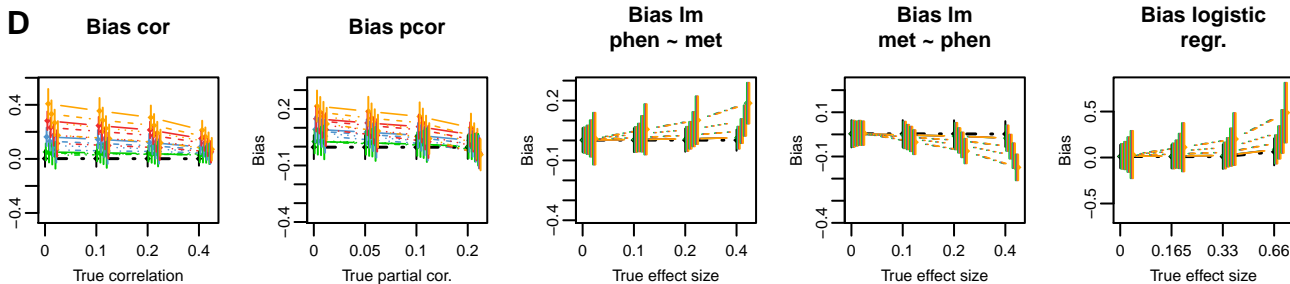
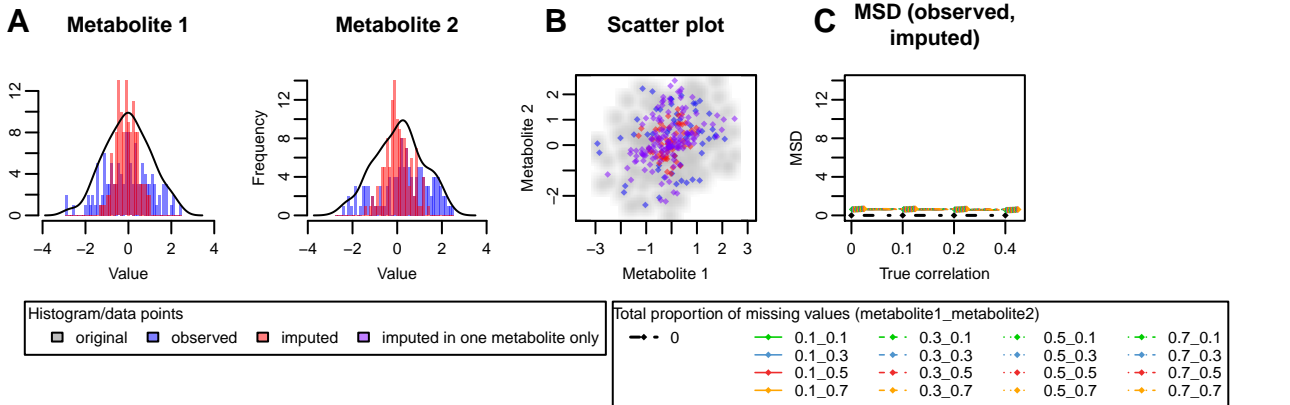
Histogram/data points

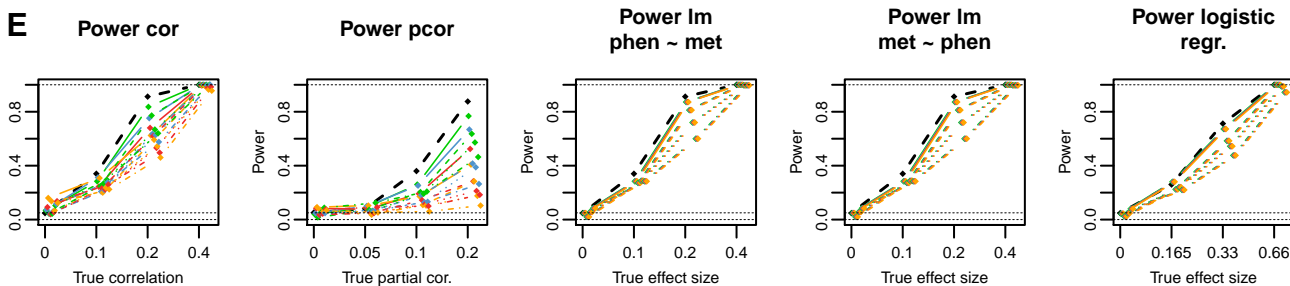
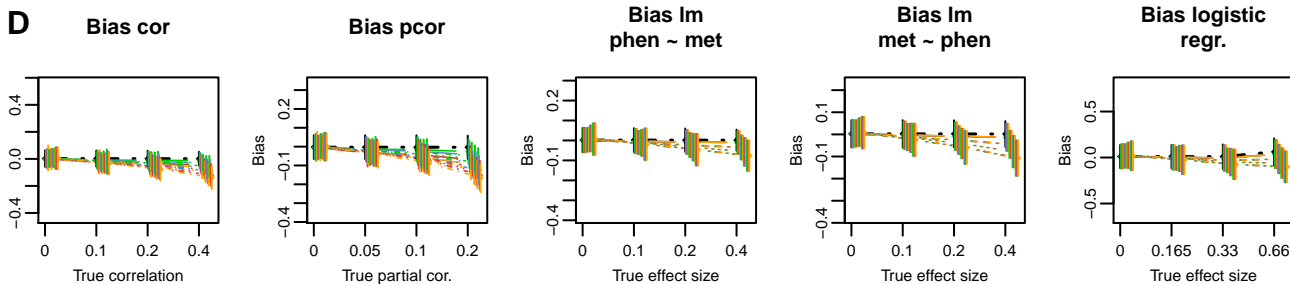
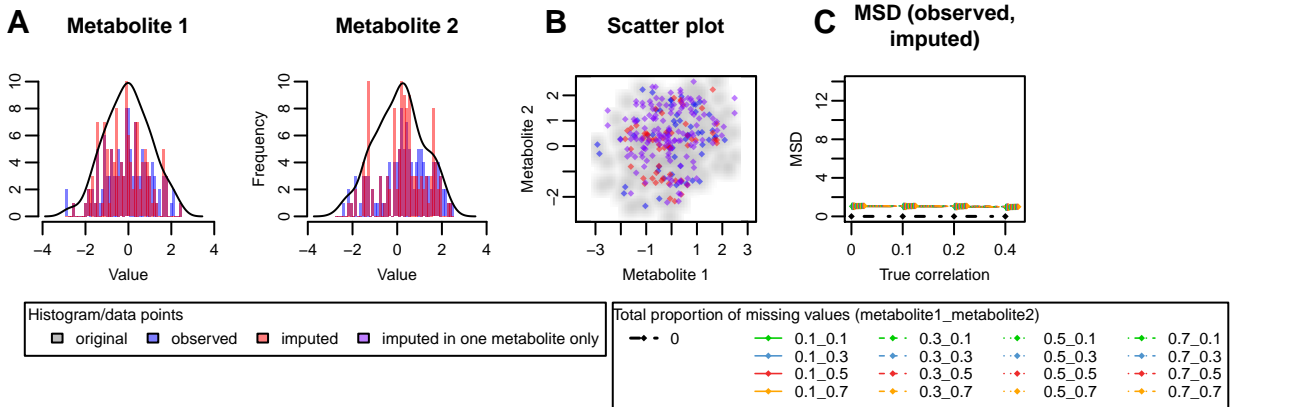
- original
- observed
- imputed
- imputed in one metabolite only

Total proportion of missing values (metabolite1-metabolite2)

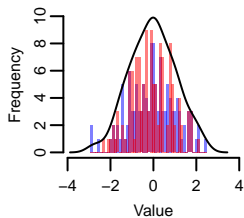
- 0
- 0.1_0.1
- 0.1_0.3
- 0.1_0.5
- 0.1_0.7
- 0.3_0.1
- 0.3_0.3
- 0.3_0.5
- 0.3_0.7
- 0.5_0.1
- 0.5_0.3
- 0.5_0.5
- 0.5_0.7
- 0.7_0.1
- 0.7_0.3
- 0.7_0.5
- 0.7_0.7



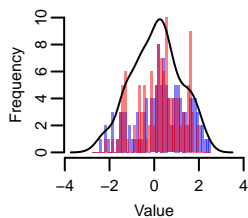




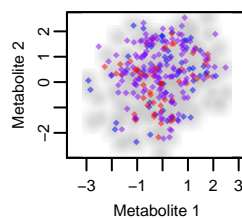
A Metabolite 1



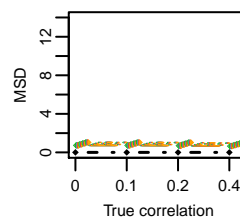
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



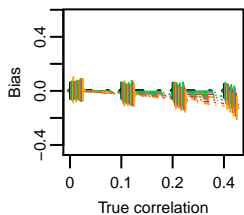
Histogram/data points

original observed imputed imputed in one metabolite only

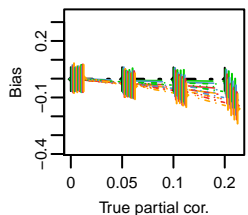
Total proportion of missing values (metabolite1-metabolite2)

- - 0
 0.1_0.1 0.1_0.3 0.1_0.5 0.1_0.7
 0.3_0.1 0.3_0.3 0.3_0.5 0.3_0.7
 0.5_0.1 0.5_0.3 0.5_0.5 0.5_0.7
 0.7_0.1 0.7_0.3 0.7_0.5 0.7_0.7

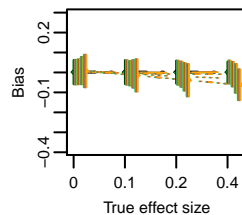
D Bias cor



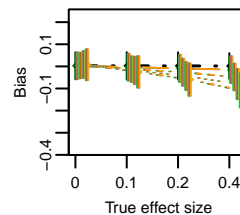
Bias pcor



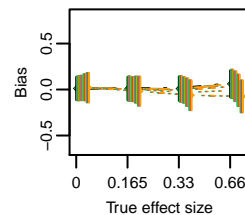
Bias Im phen ~ met



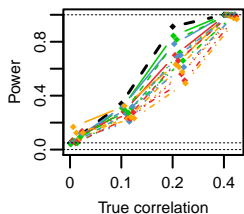
Bias Im met ~ phen



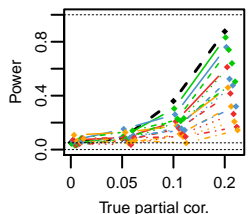
Bias logistic regr.



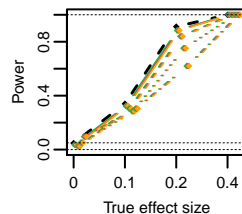
E Power cor



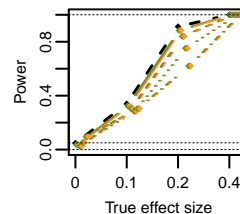
Power pcor



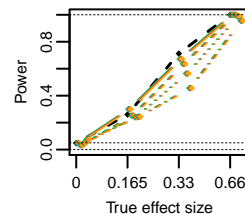
Power Im phen ~ met

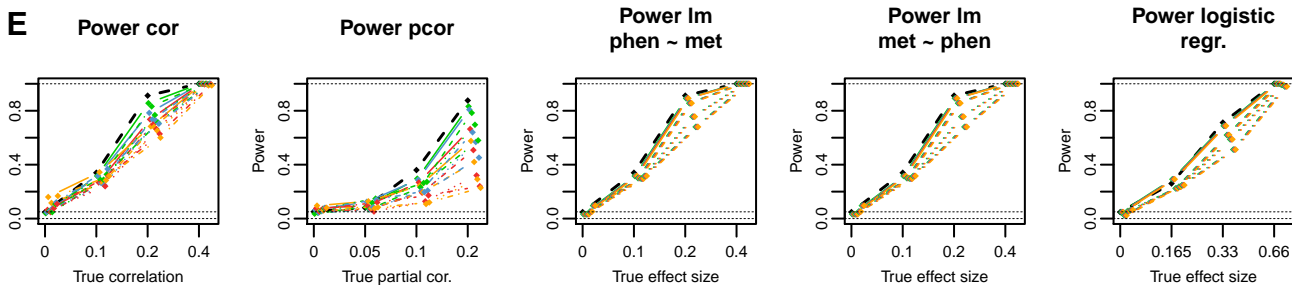
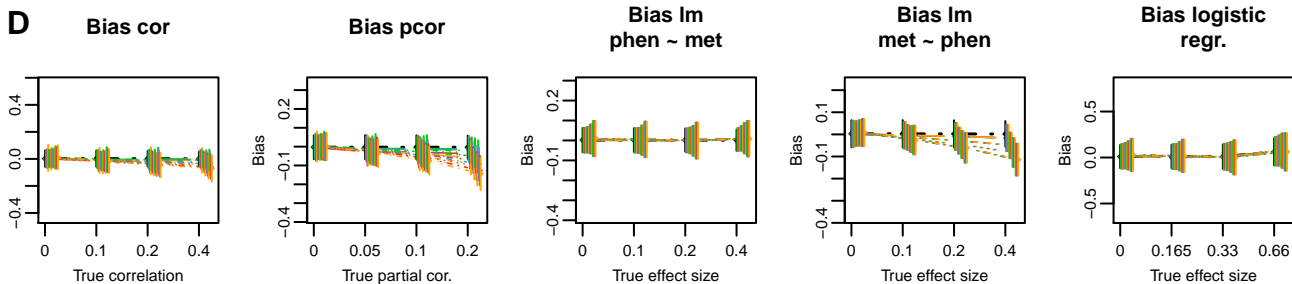
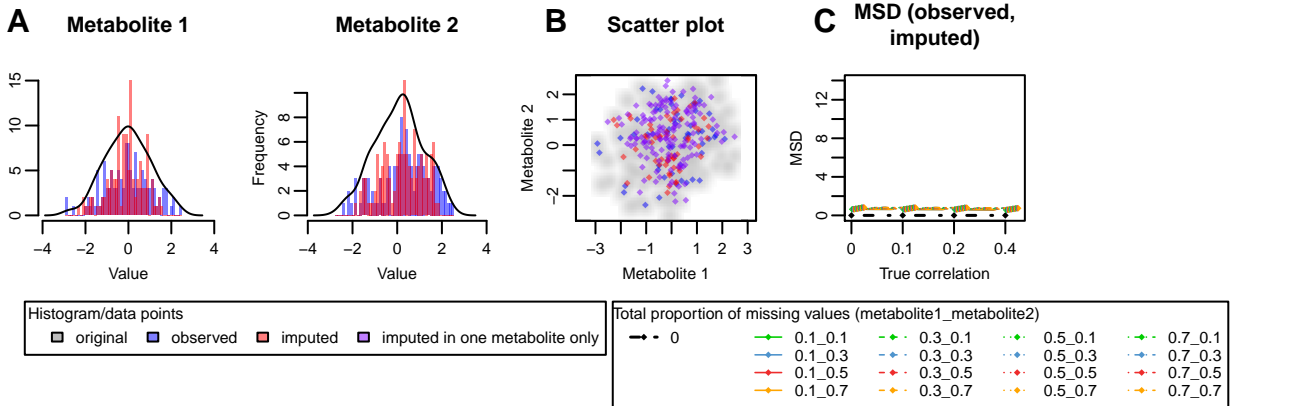


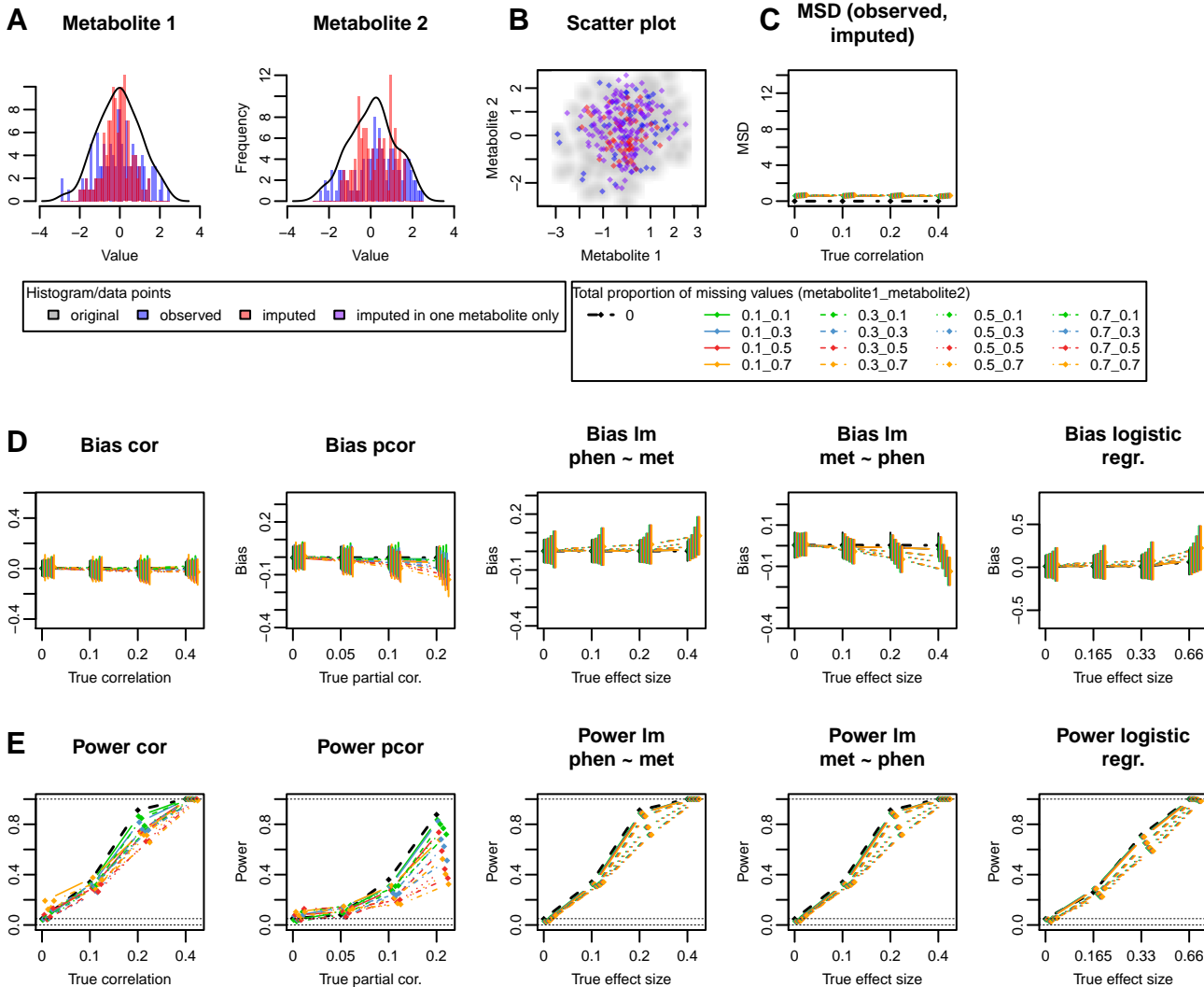
Power Im met ~ phen

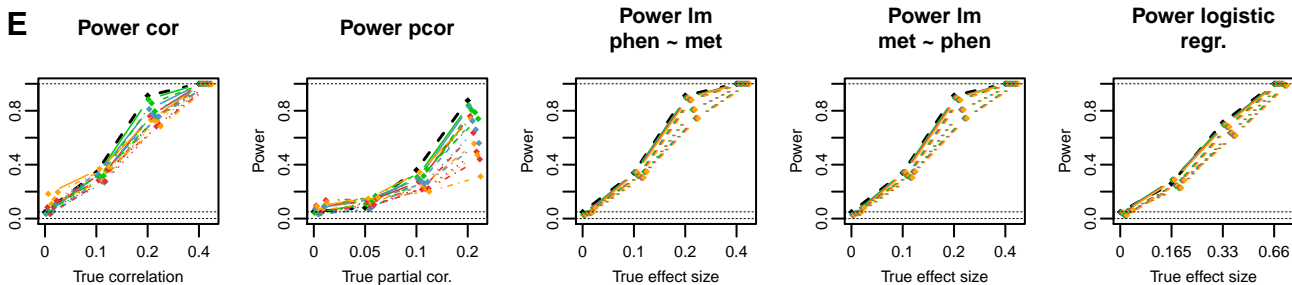
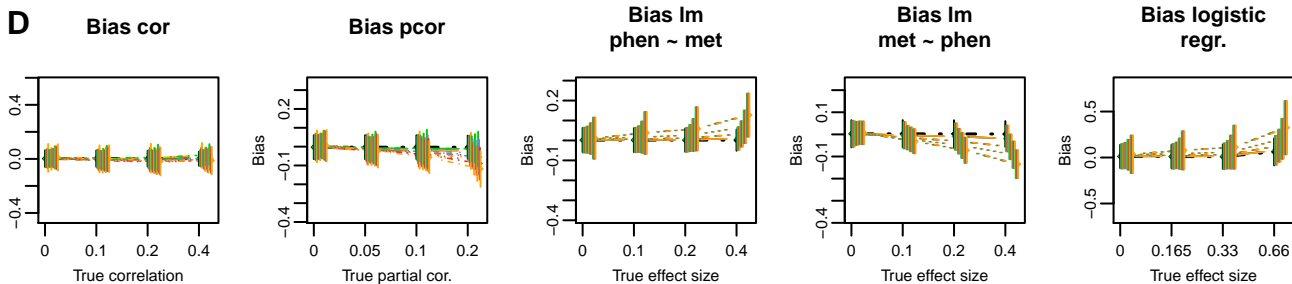
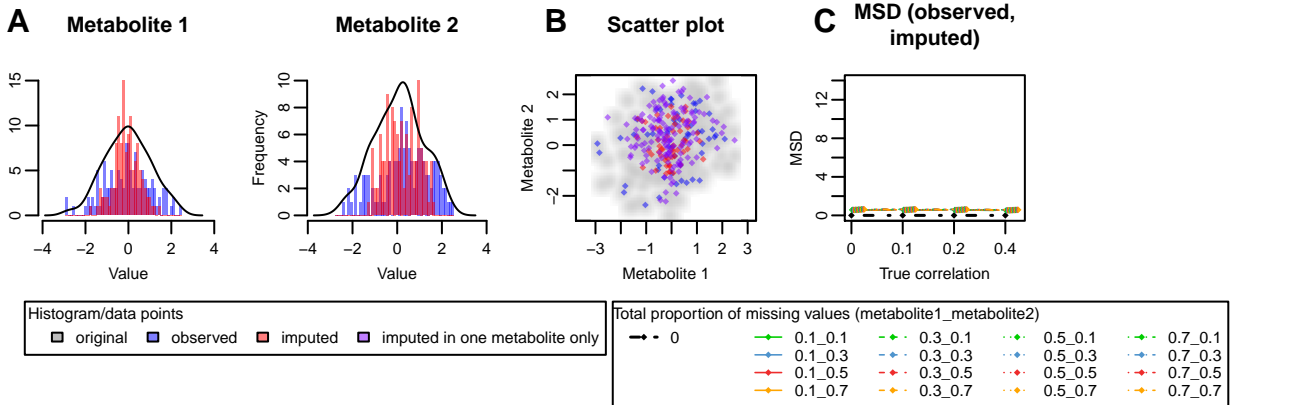


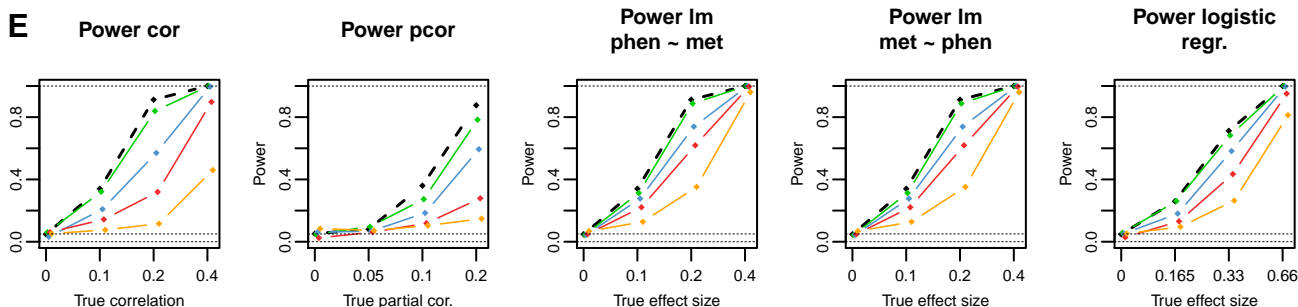
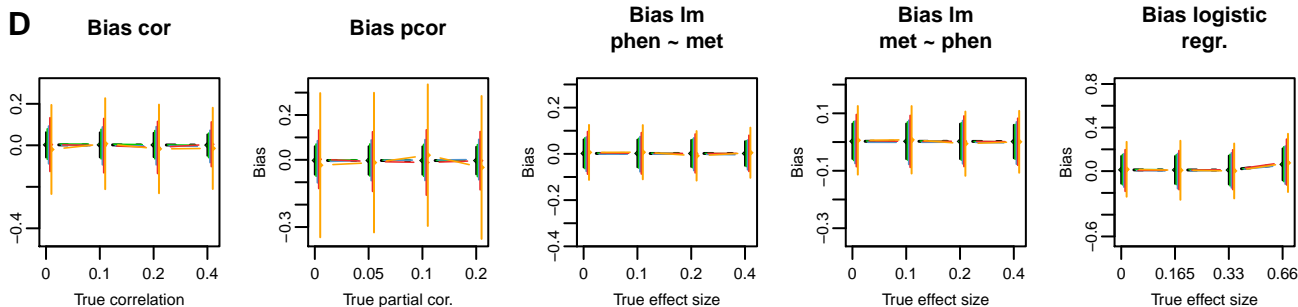
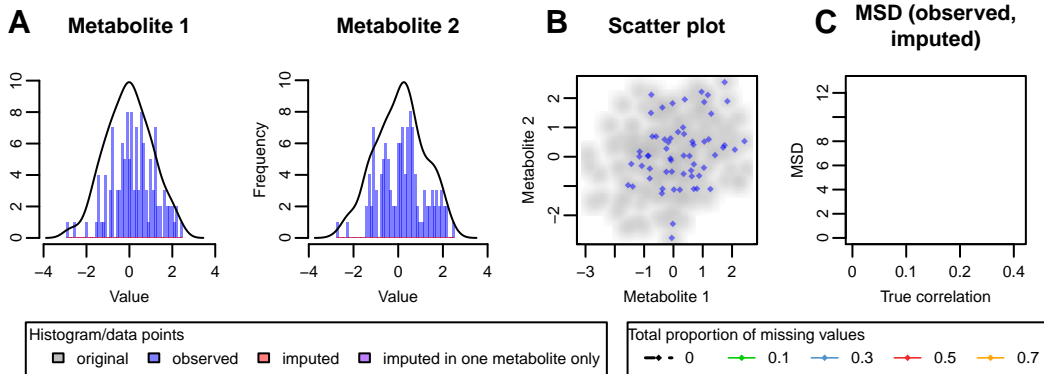
Power logistic regr.

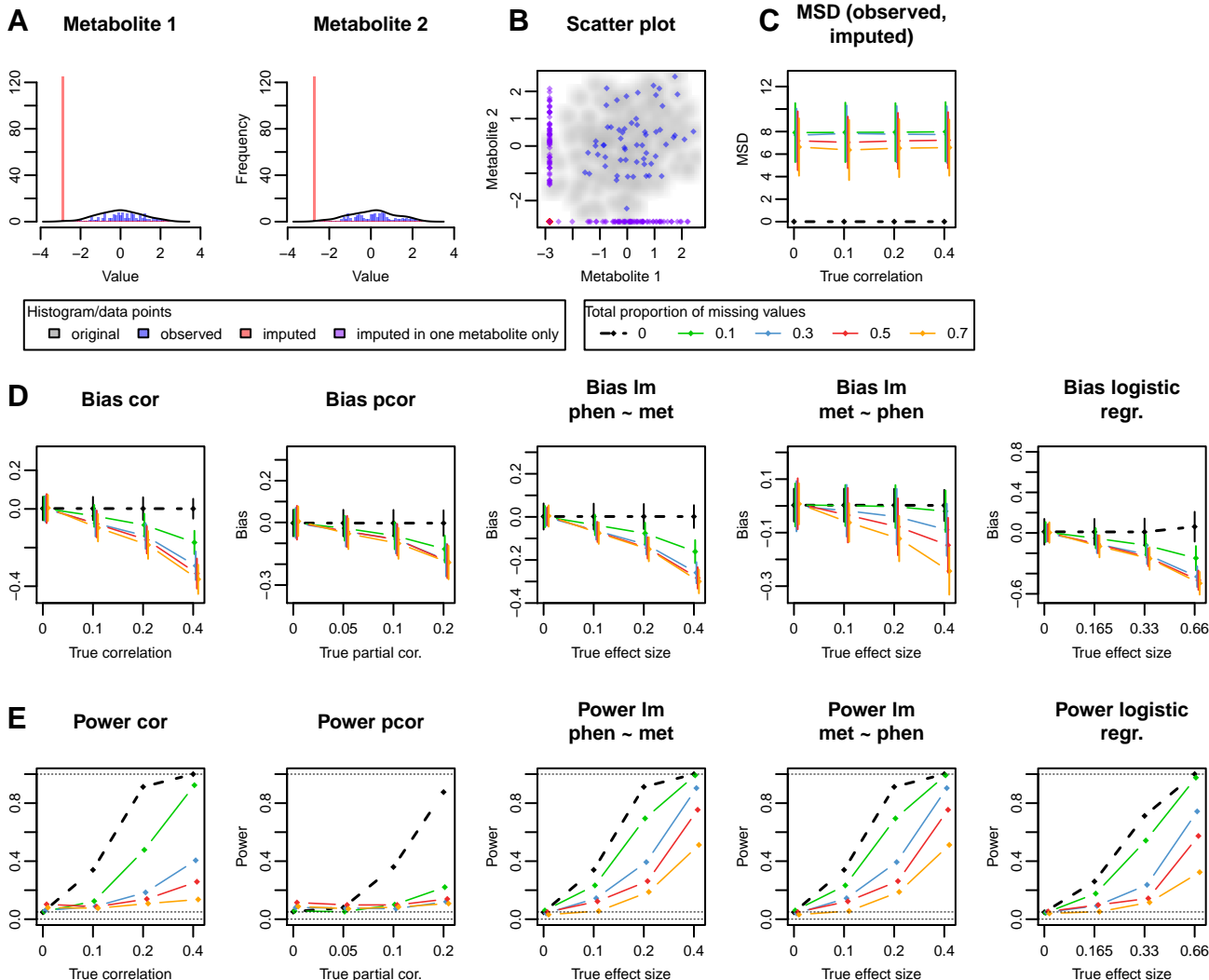


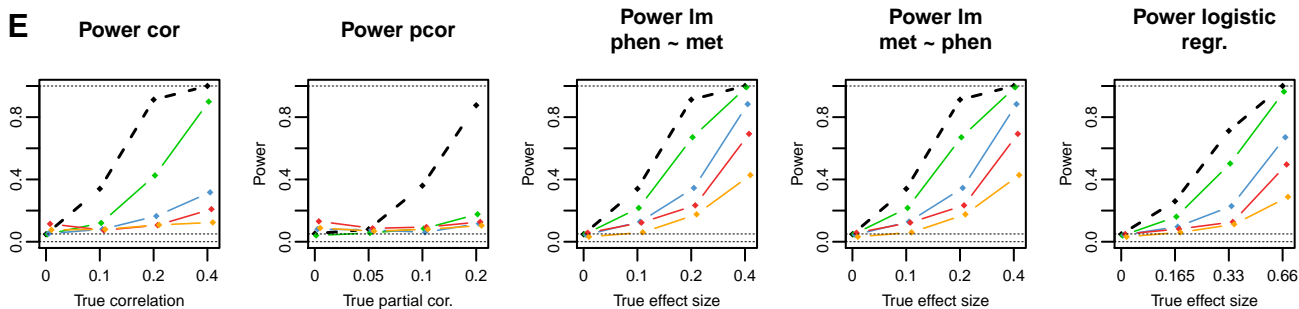
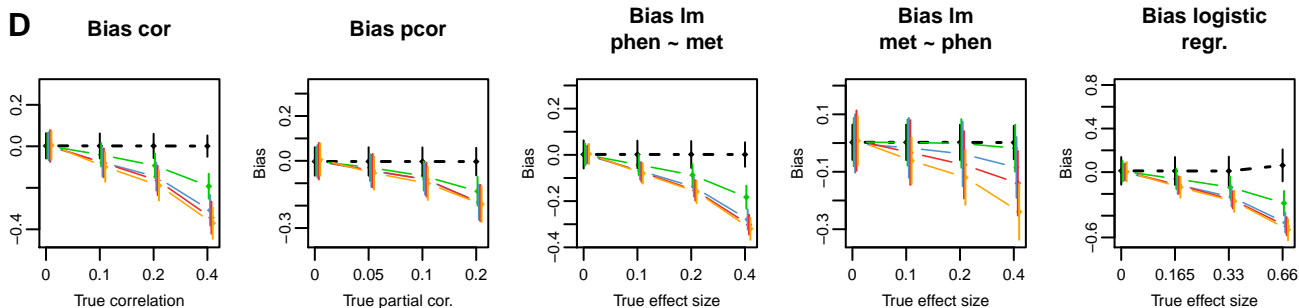
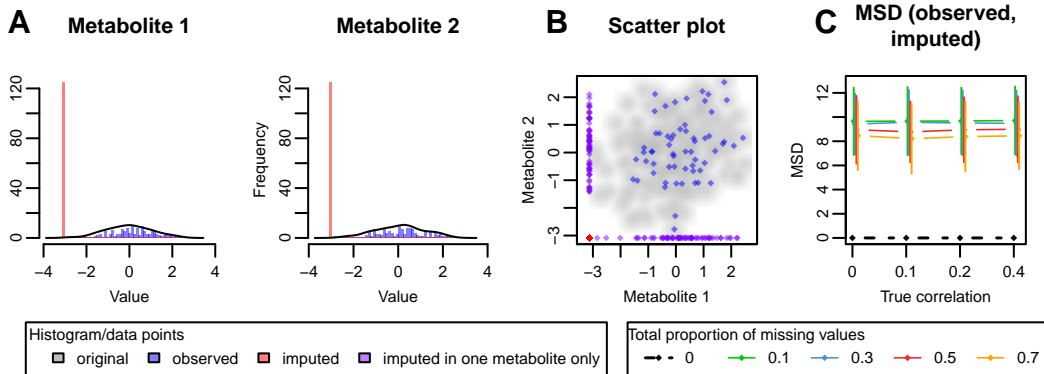


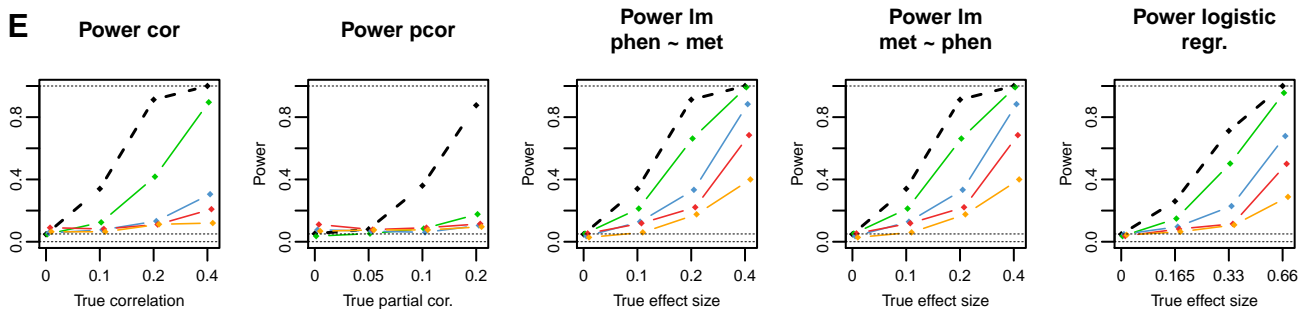
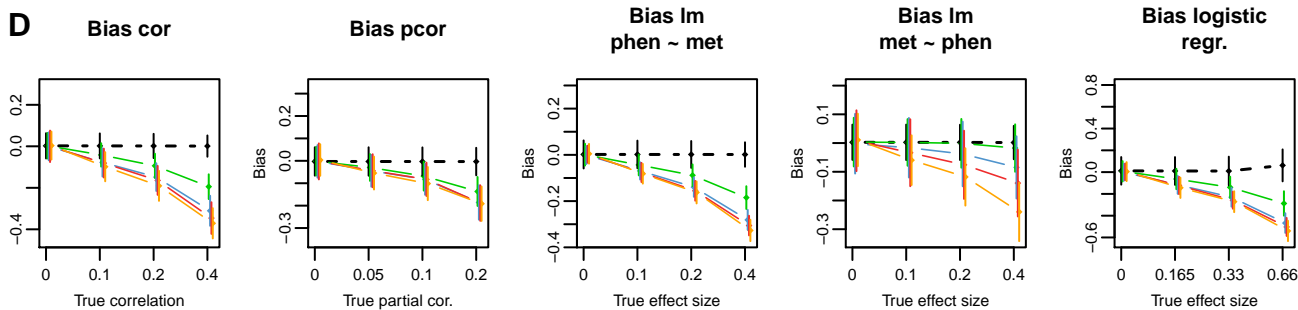
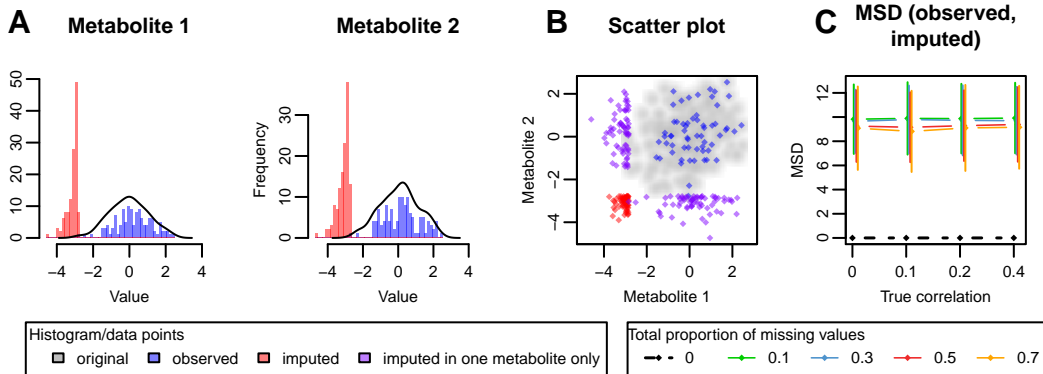


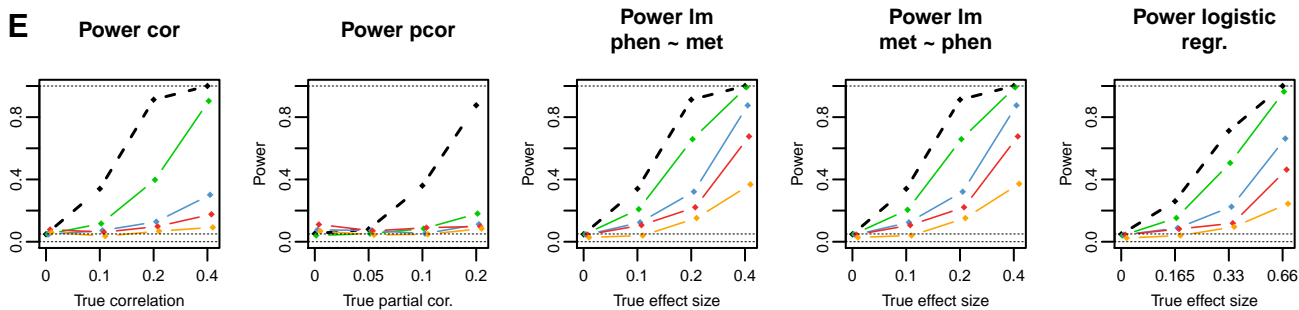
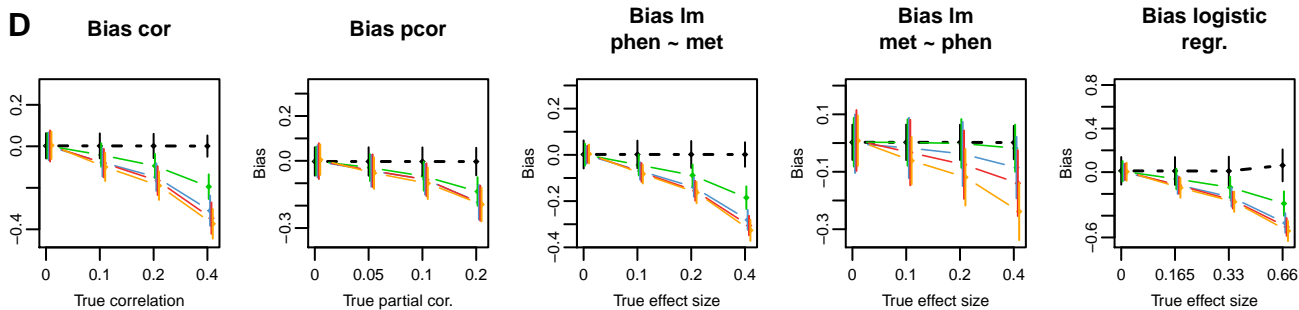
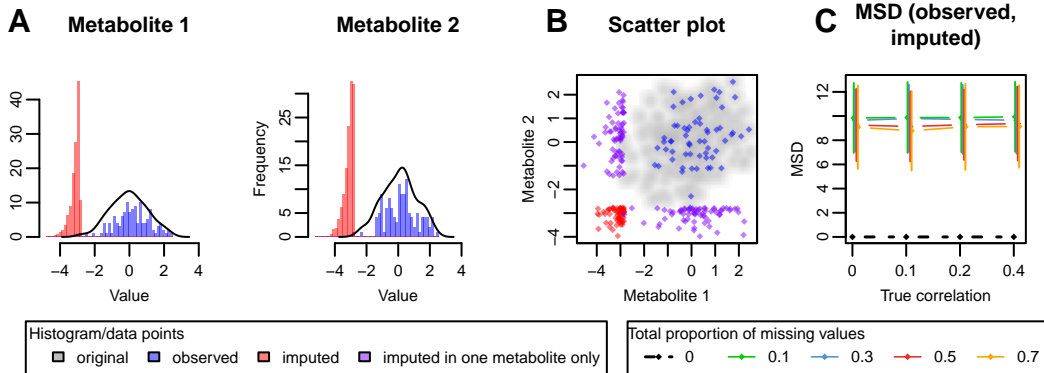




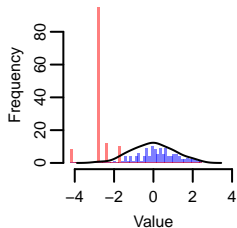




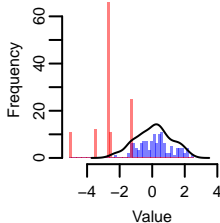




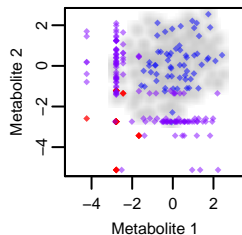
A Metabolite 1



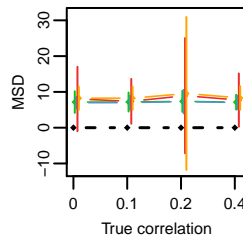
Metabolite 2



B Scatter plot



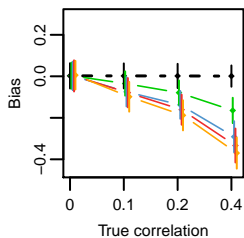
C MSD (observed, imputed)



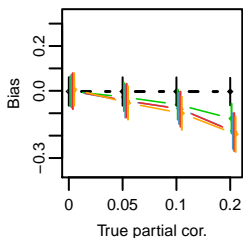
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 - - 0 — 0.1 — 0.3 — 0.5 — 0.7

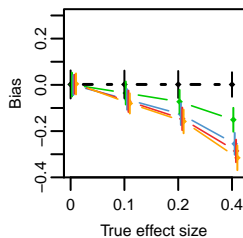
D Bias cor



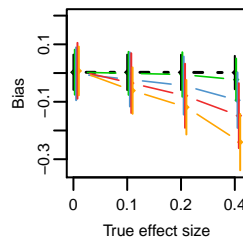
Bias pcor



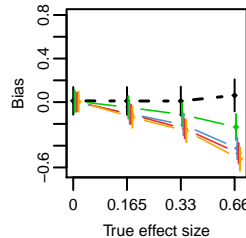
Bias lm phen ~ met



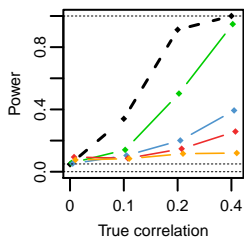
Bias lm met ~ phen



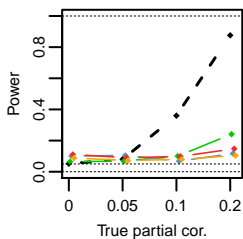
Bias logistic regr.



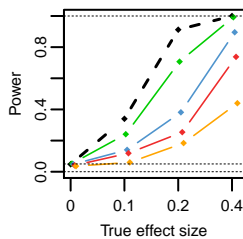
E Power cor



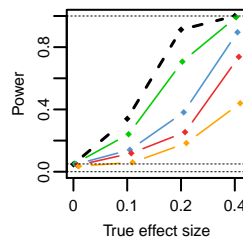
Power pcor



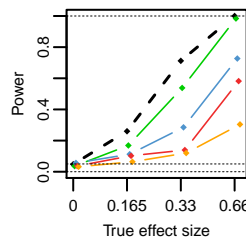
Power lm phen ~ met



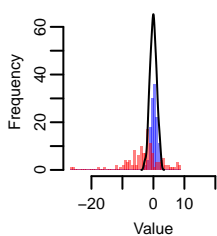
Power lm met ~ phen



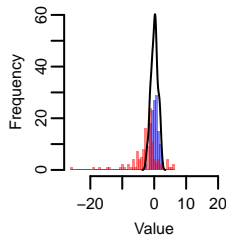
Power logistic regr.



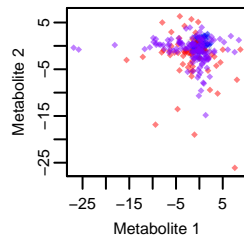
A Metabolite 1



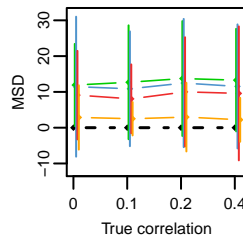
Metabolite 2



B Scatter plot



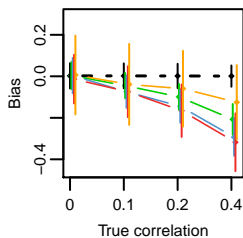
C MSD (observed, imputed)



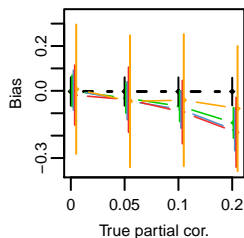
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 - - 0 - - 0.1 - - 0.3 - - 0.5 - - 0.7

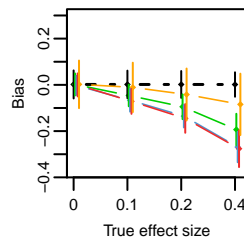
D Bias cor



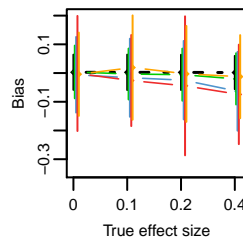
Bias pcor



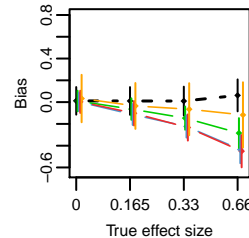
Bias lm phen ~ met



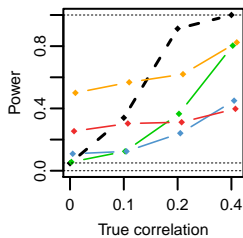
Bias lm met ~ phen



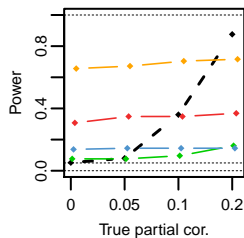
Bias logistic regr.



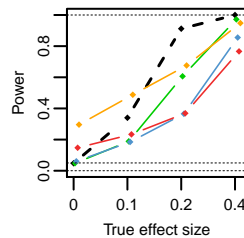
E Power cor



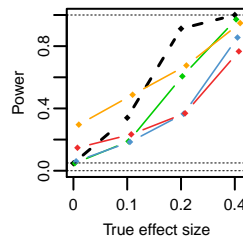
Power pcor



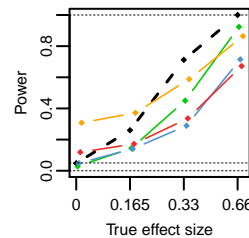
Power lm phen ~ met

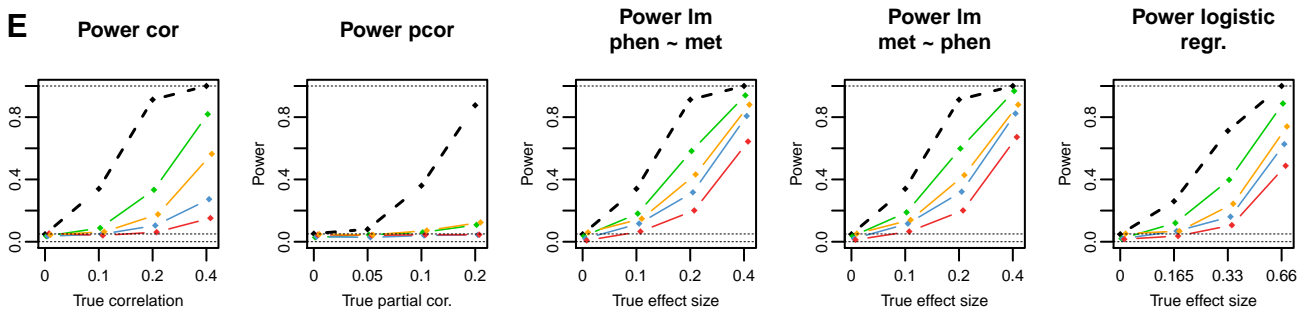
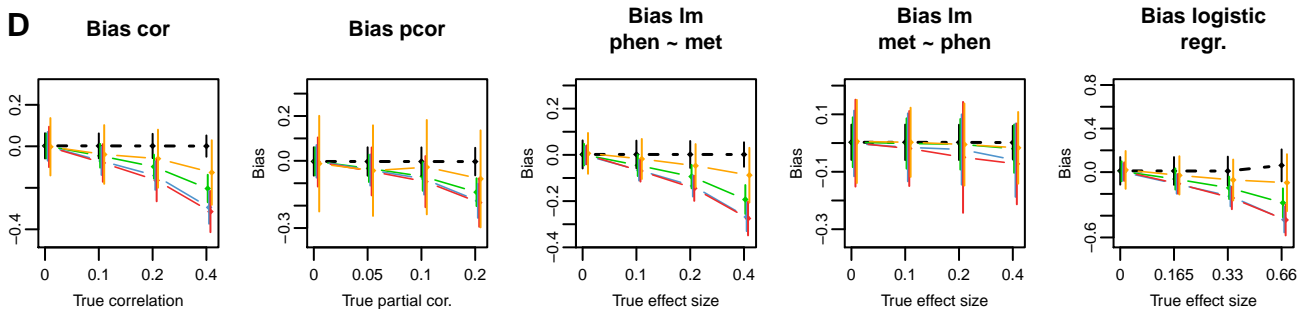
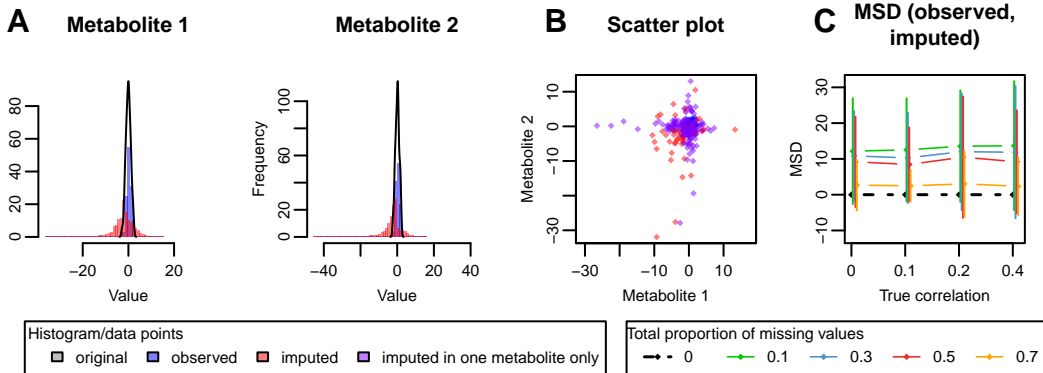


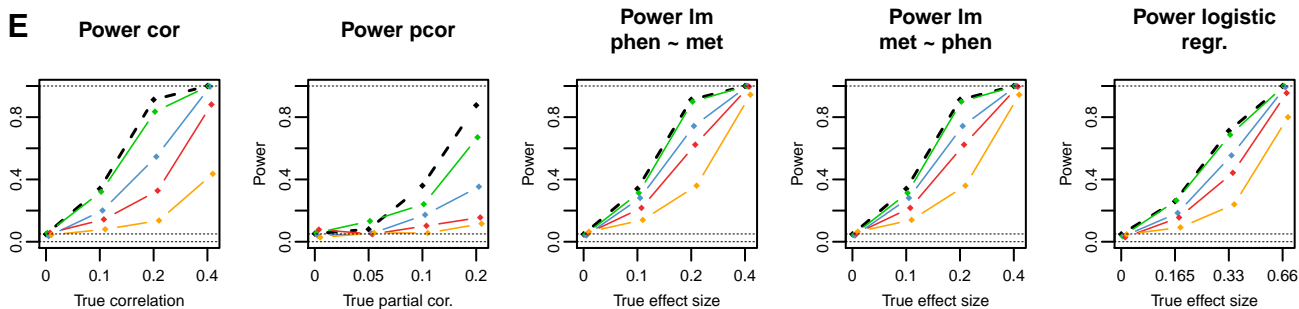
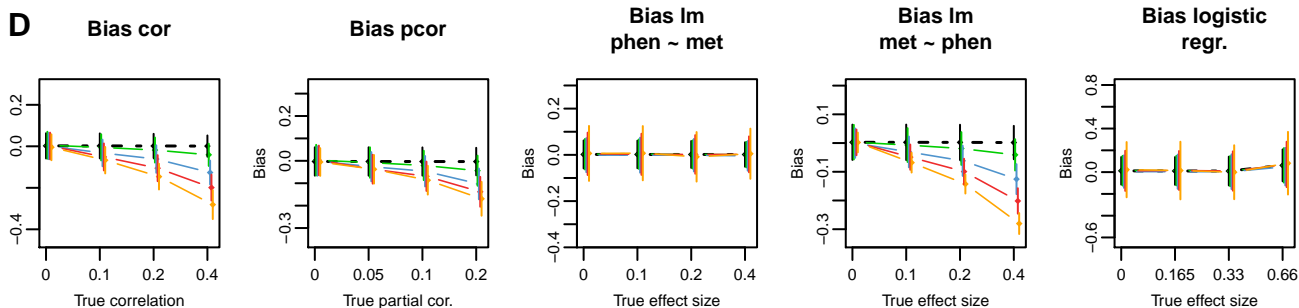
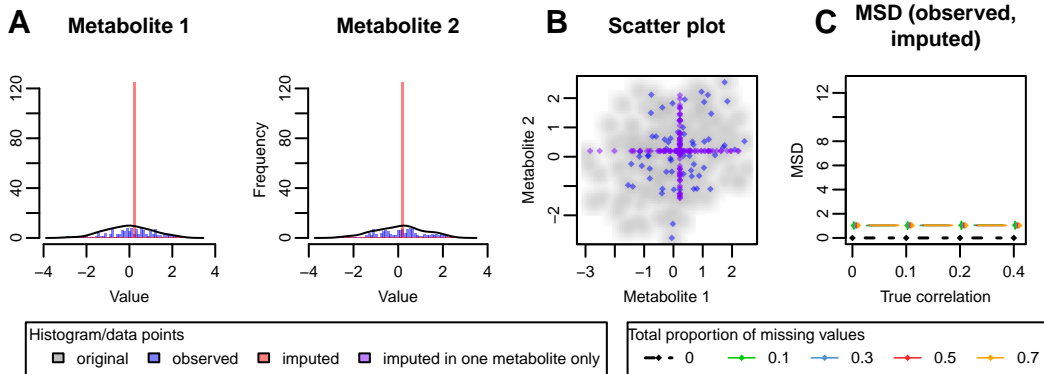
Power lm met ~ phen

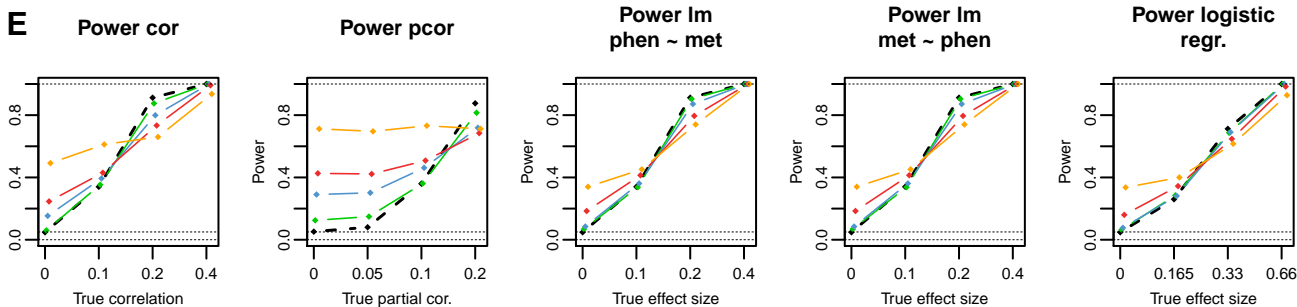
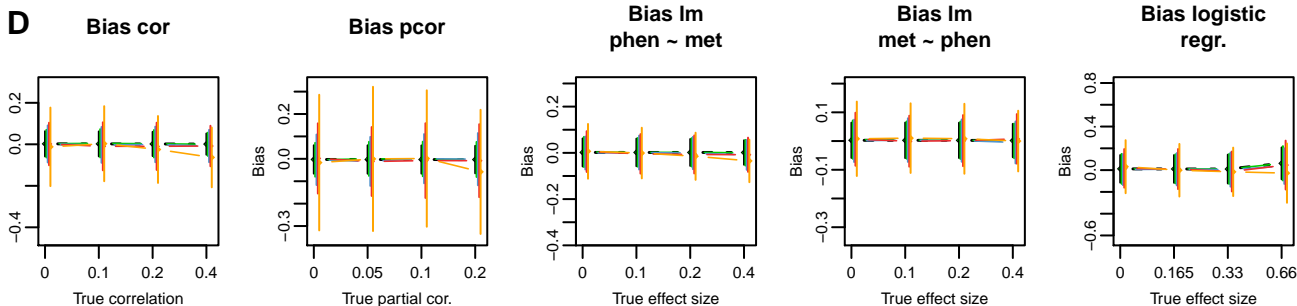
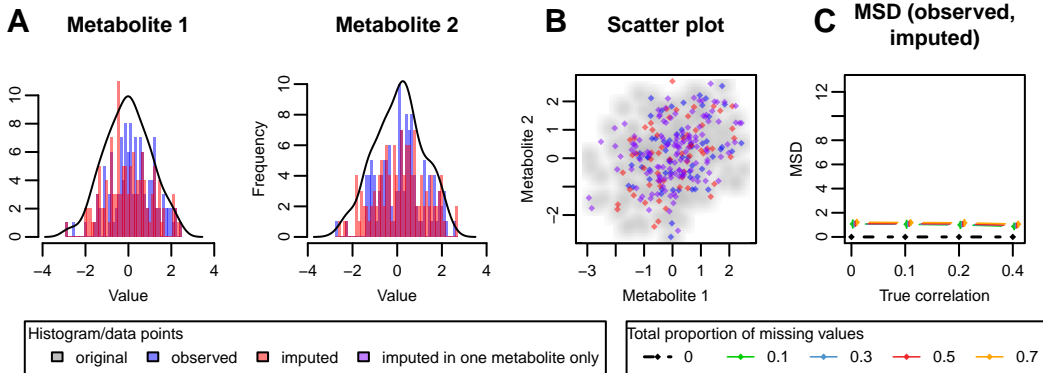


Power logistic regr.

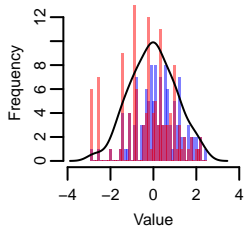




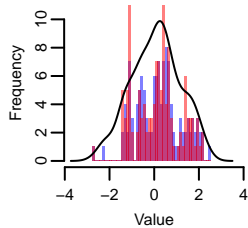




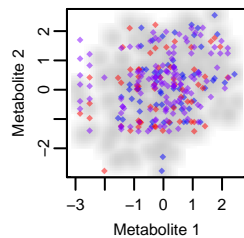
A Metabolite 1



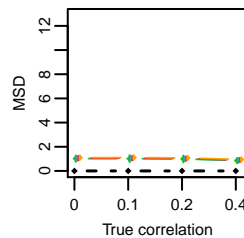
Metabolite 2



B Scatter plot



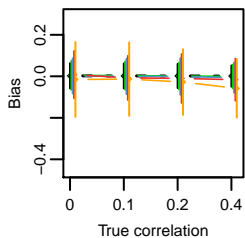
C MSD (observed, imputed)



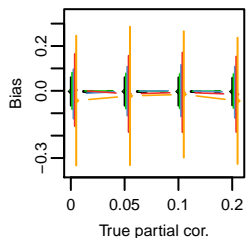
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 ● 0 ● 0.1 ● 0.3 ● 0.5 ● 0.7

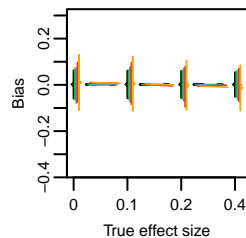
D Bias cor



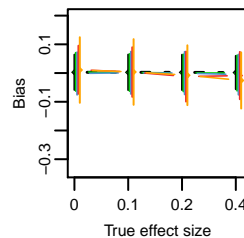
Bias pcor



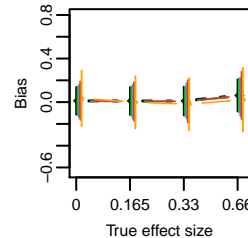
Bias lm phen ~ met



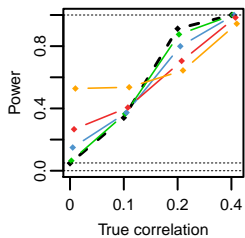
Bias lm met ~ phen



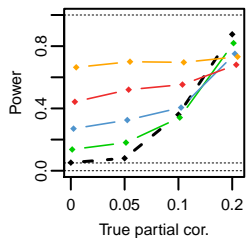
Bias logistic regr.



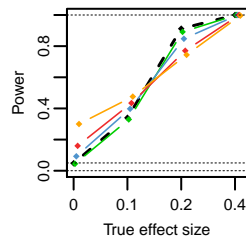
E Power cor



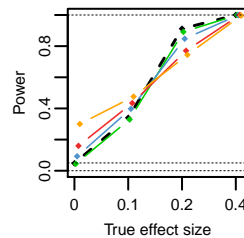
Power pcor



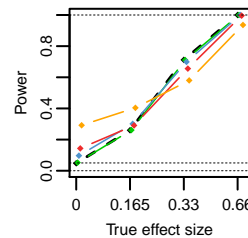
Power lm phen ~ met

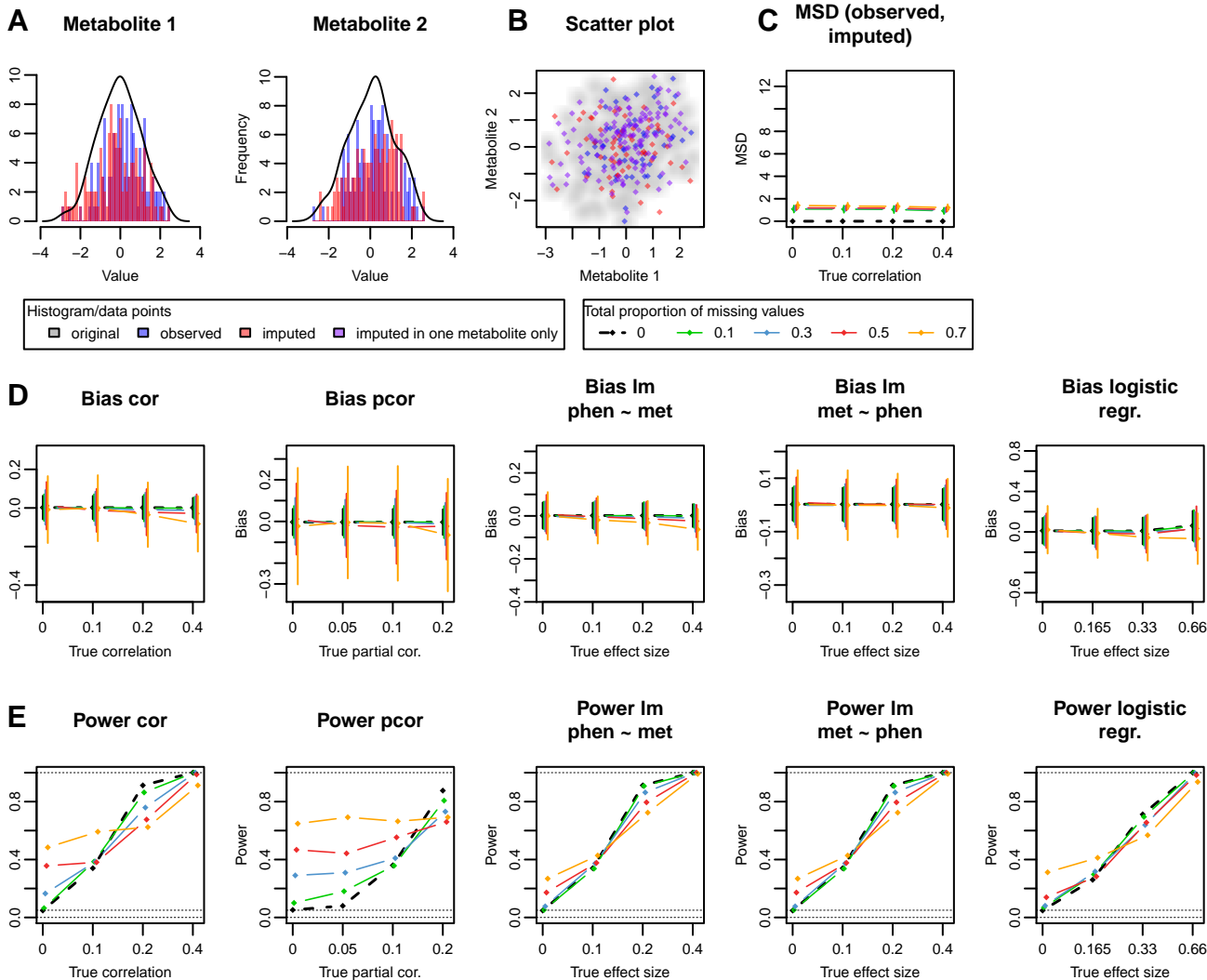


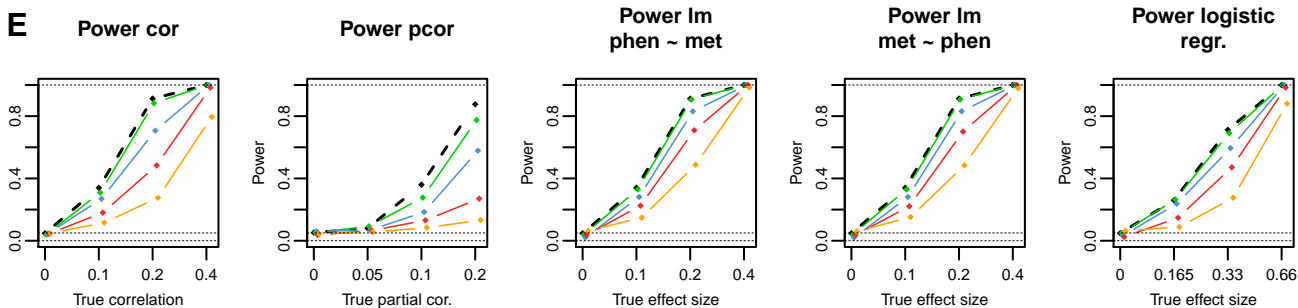
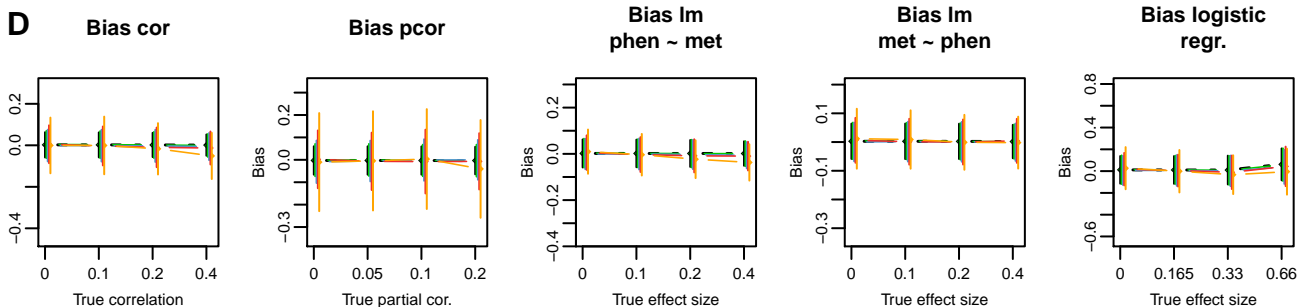
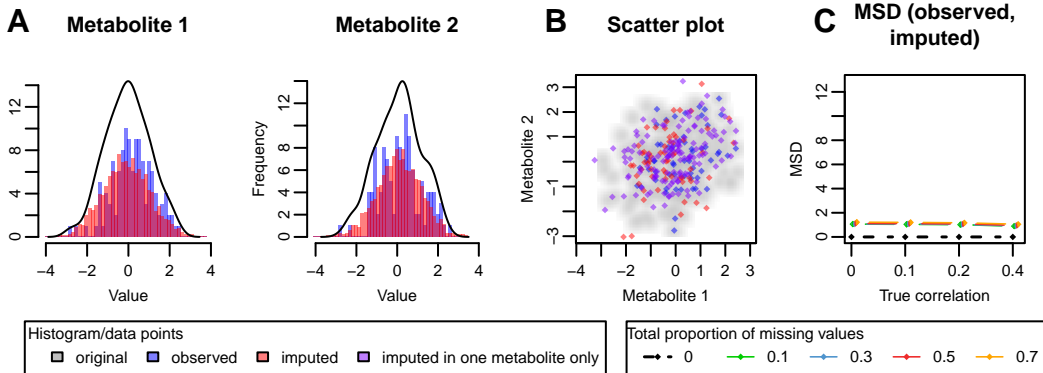
Power lm met ~ phen

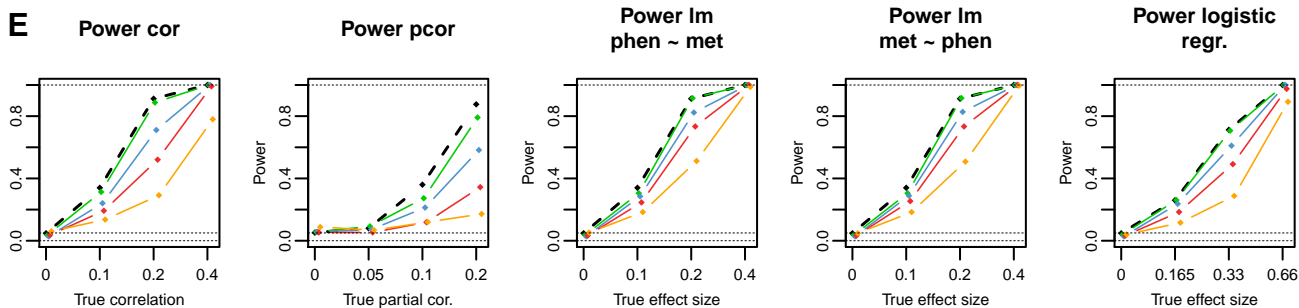
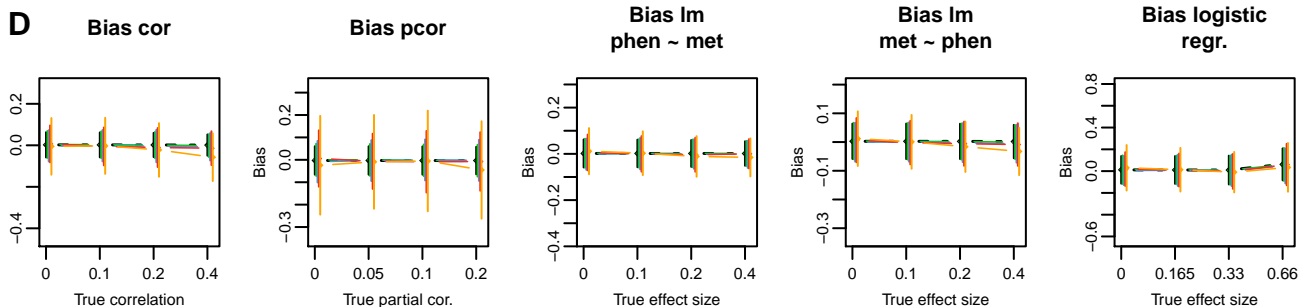
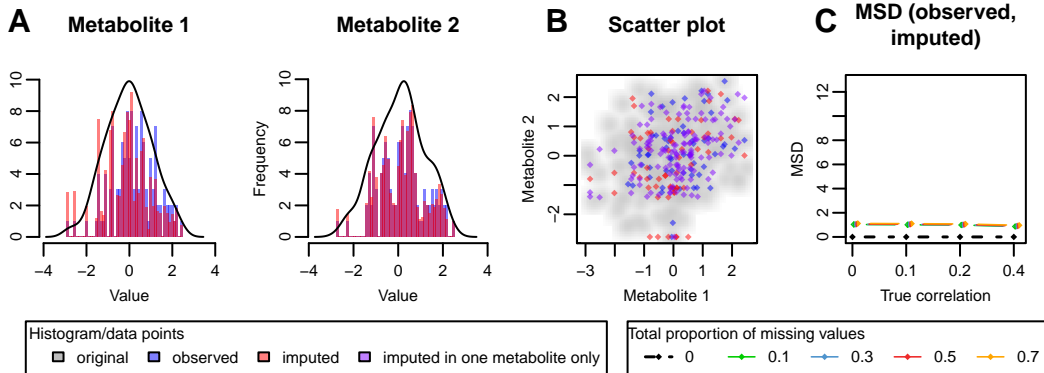


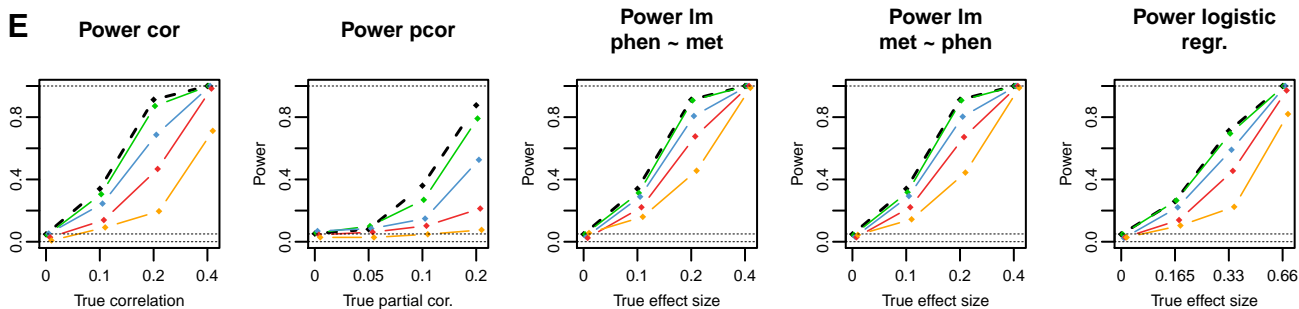
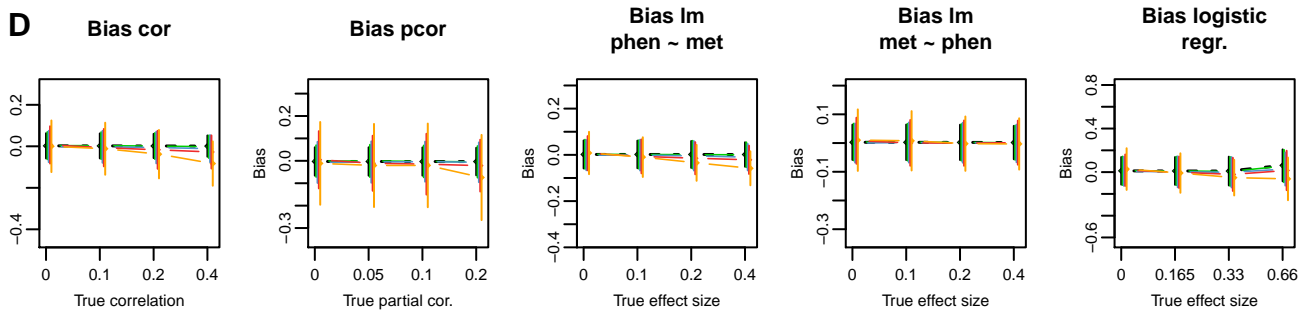
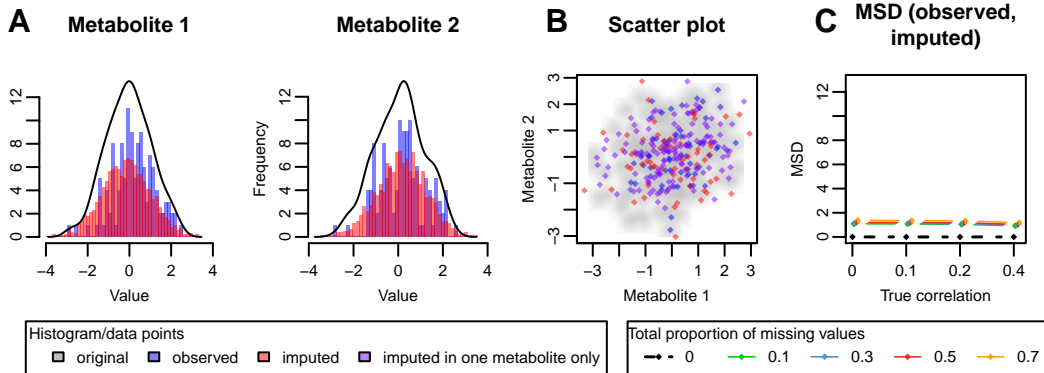
Power logistic regr.



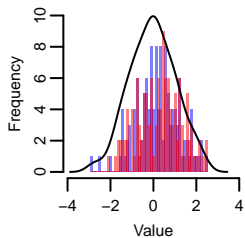




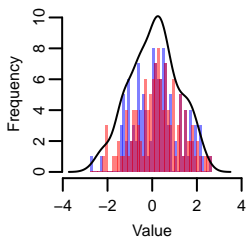




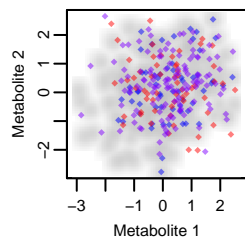
A Metabolite 1



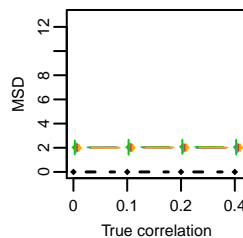
Metabolite 2



B Scatter plot



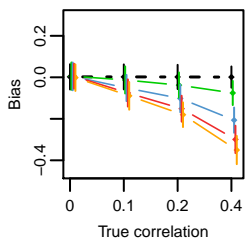
C MSD (observed, imputed)



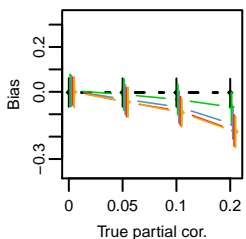
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 - - 0 — 0.1 — 0.3 — 0.5 — 0.7

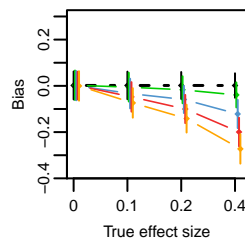
D Bias cor



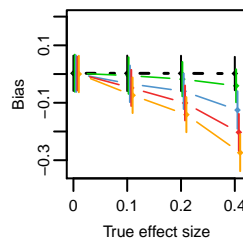
Bias pcor



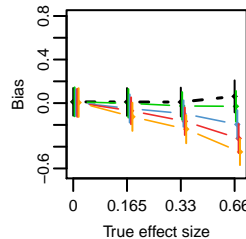
Bias lm phen ~ met



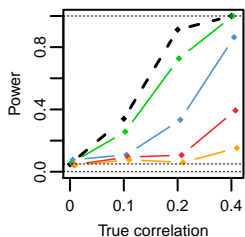
Bias lm met ~ phen



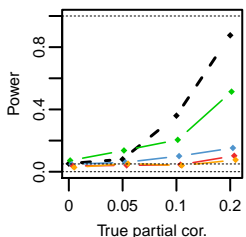
Bias logistic regr.



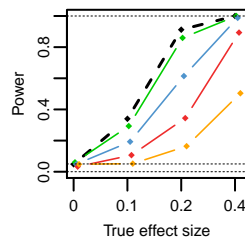
E Power cor



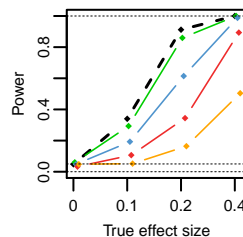
Power pcor



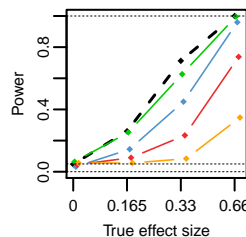
Power lm phen ~ met

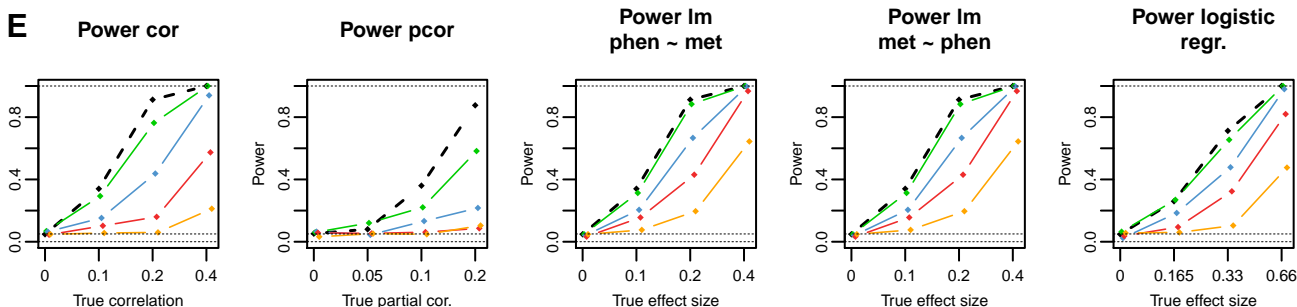
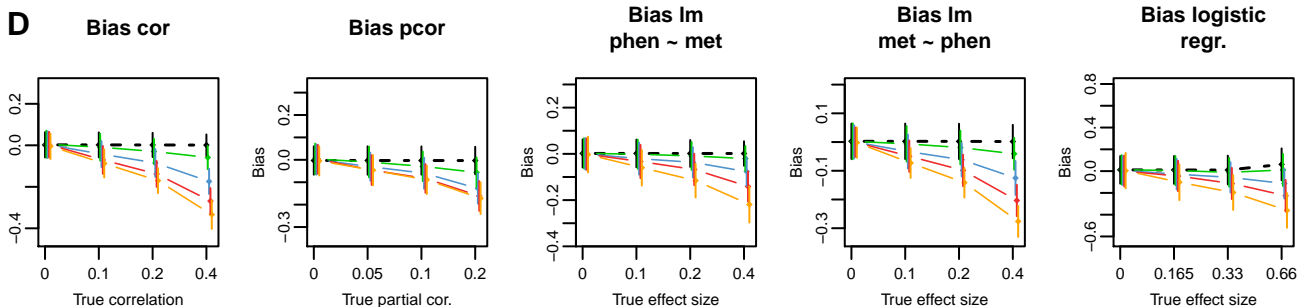
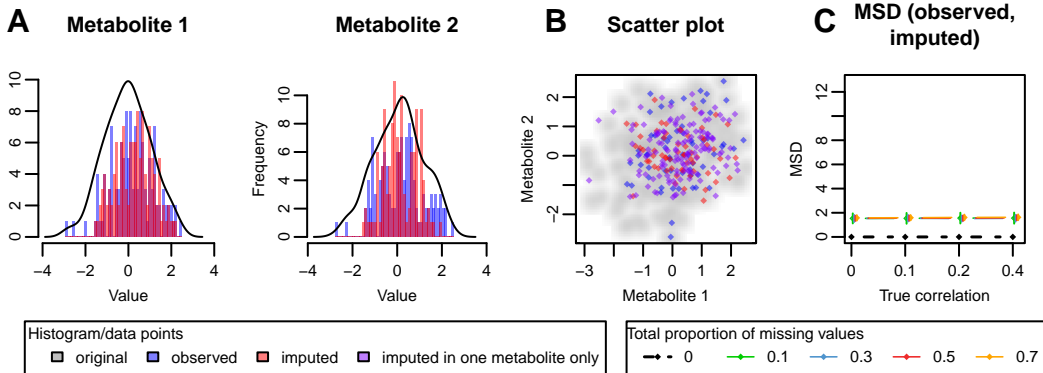


Power lm met ~ phen

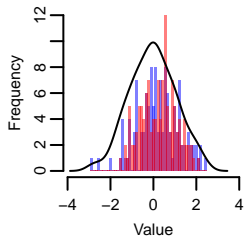


Power logistic regr.

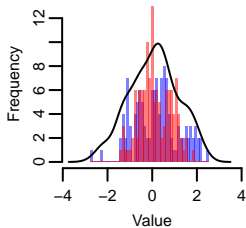




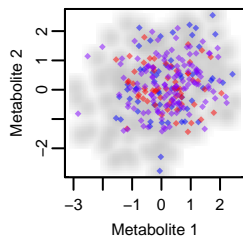
A Metabolite 1



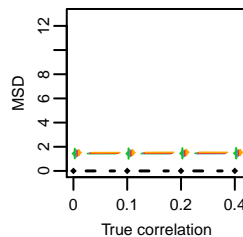
Metabolite 2



B Scatter plot



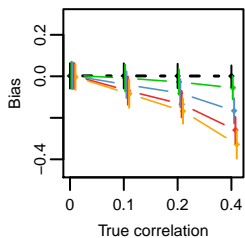
C MSD (observed, imputed)



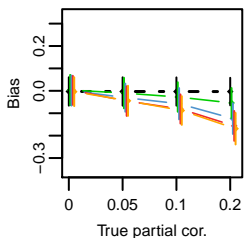
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 - - 0 - - 0.1 - - 0.3 - - 0.5 - - 0.7

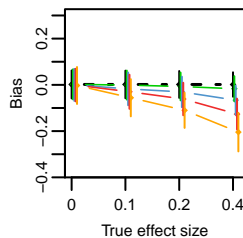
D Bias cor



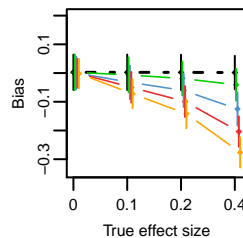
Bias pcor



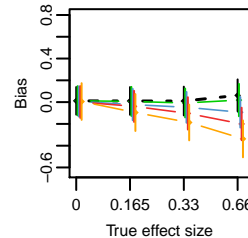
Bias lm phen ~ met



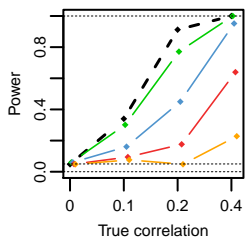
Bias lm met ~ phen



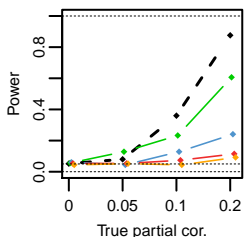
Bias logistic regr.



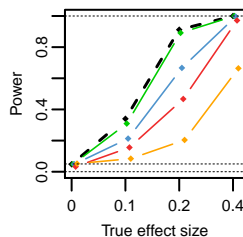
E Power cor



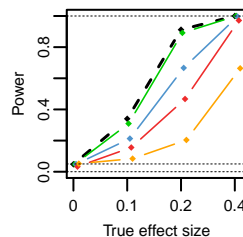
Power pcor



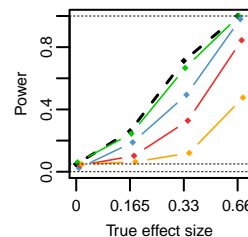
Power lm phen ~ met

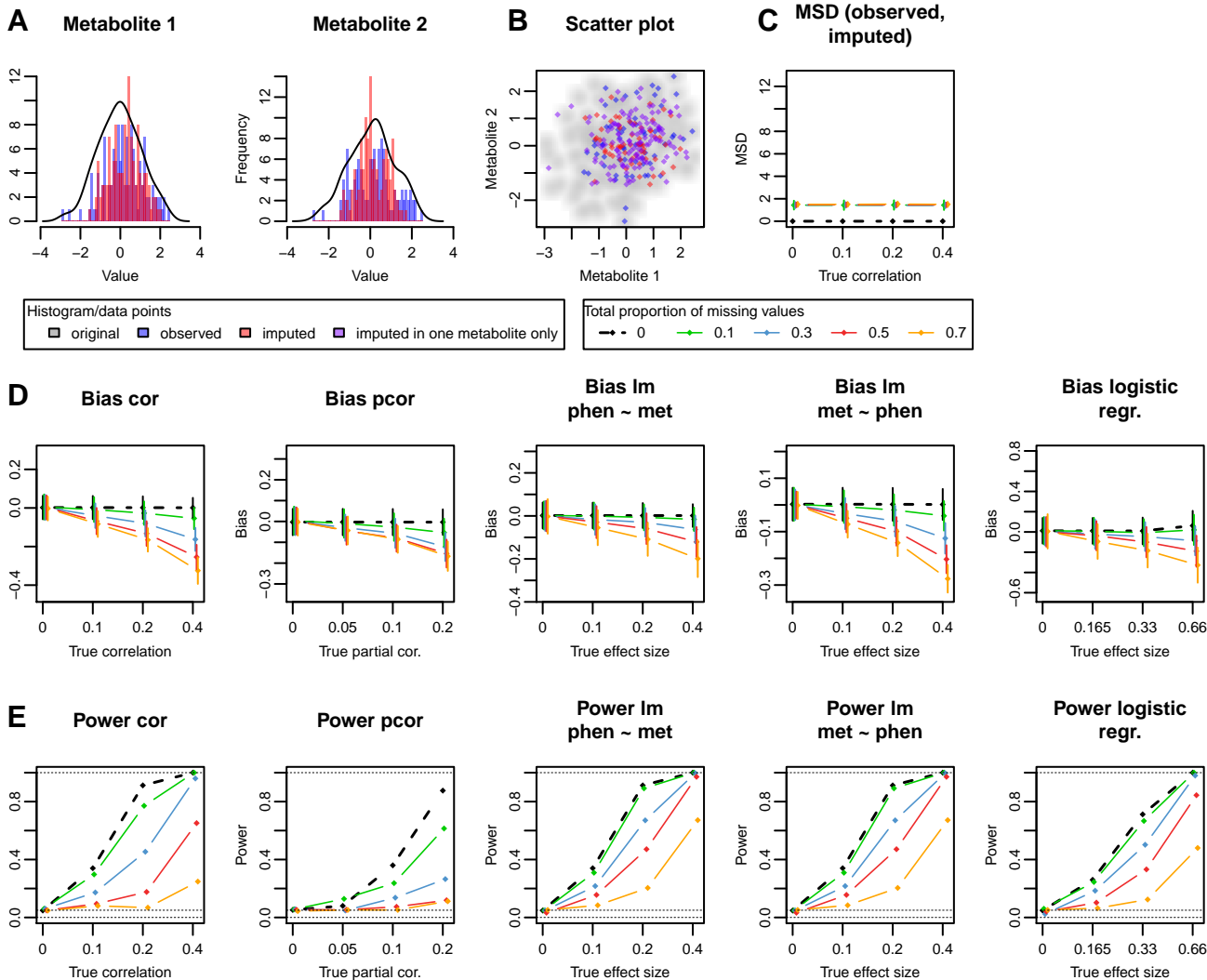


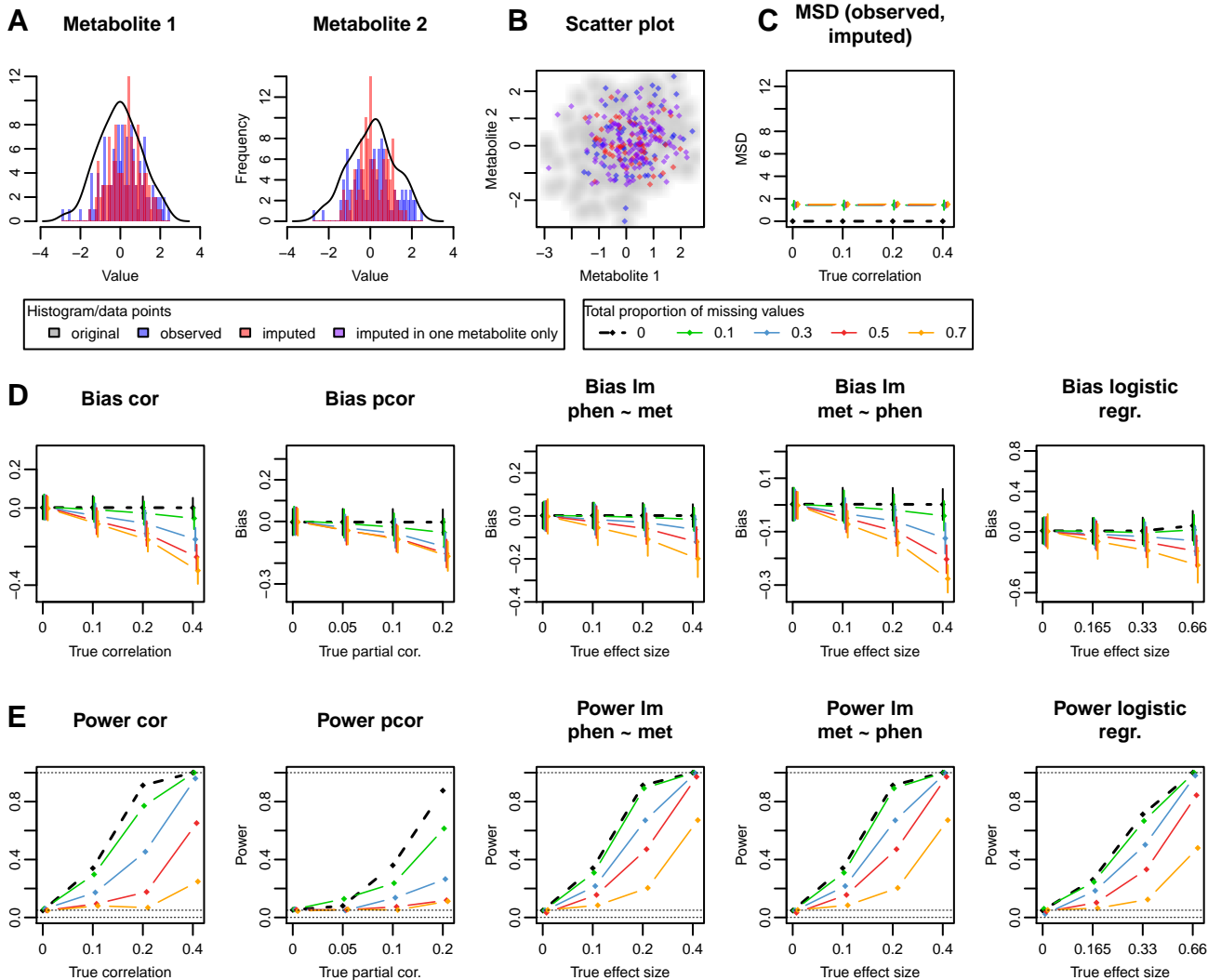
Power lm met ~ phen

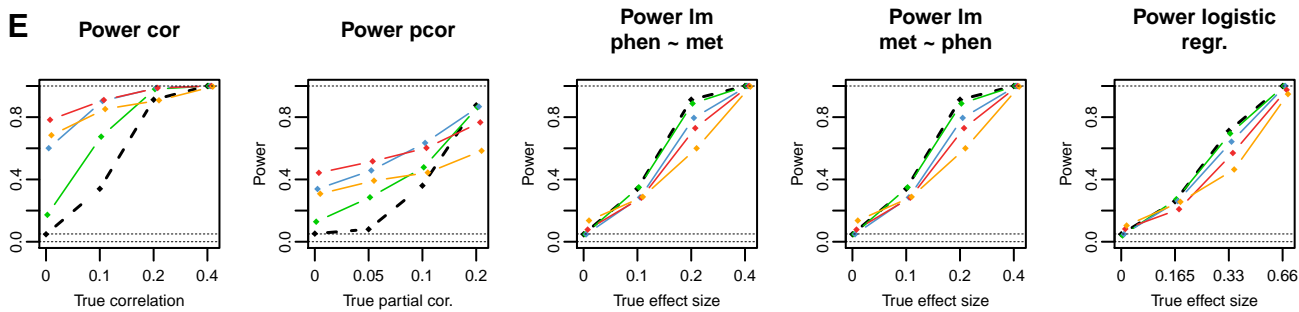
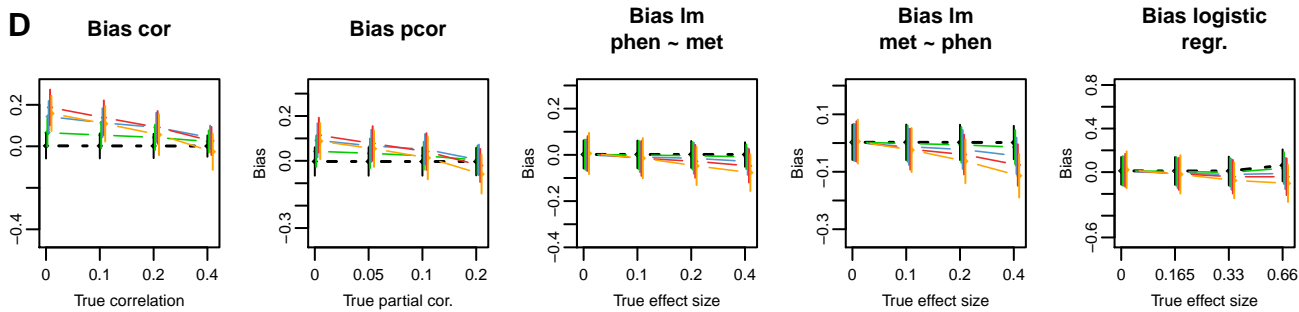
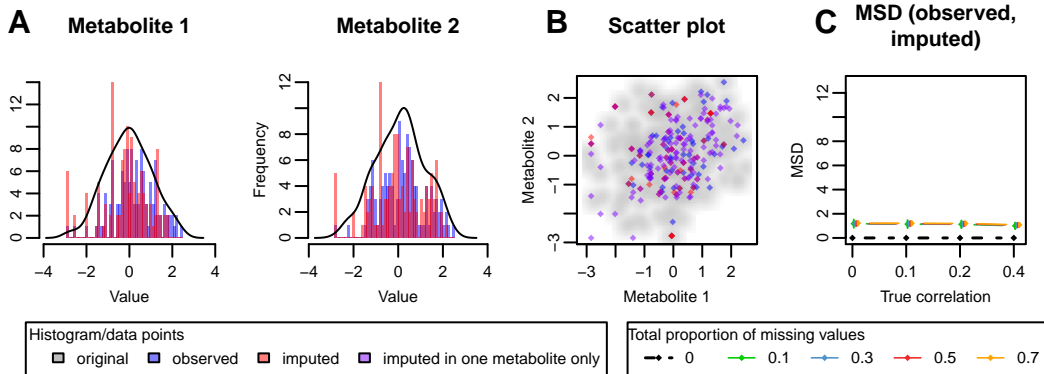


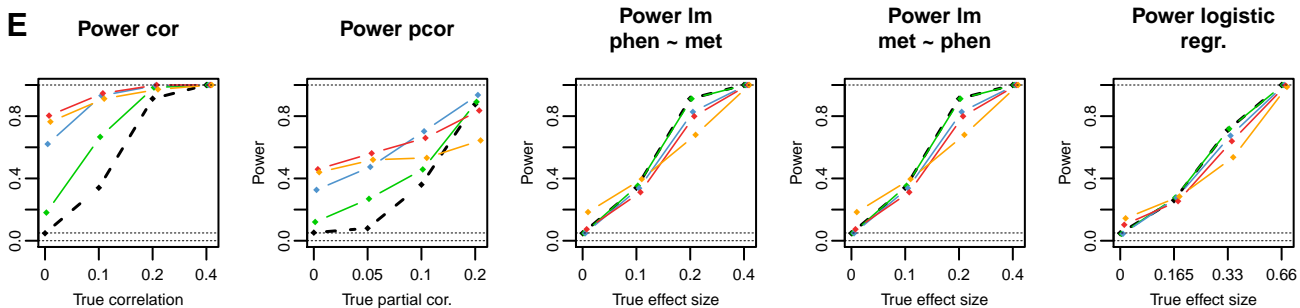
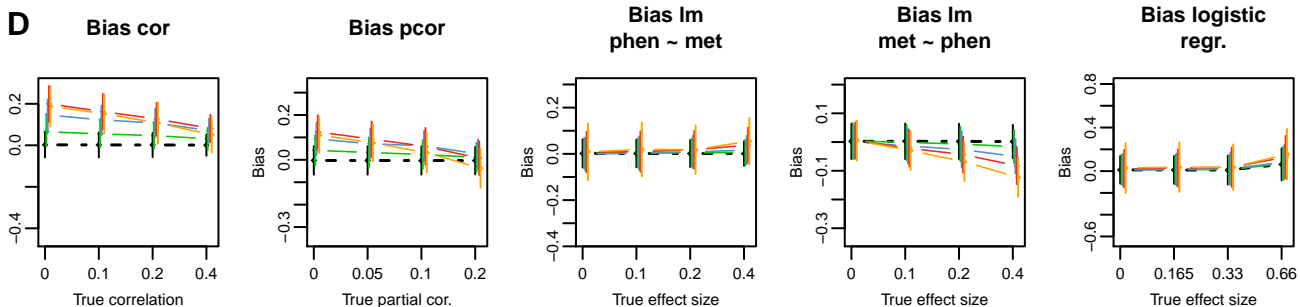
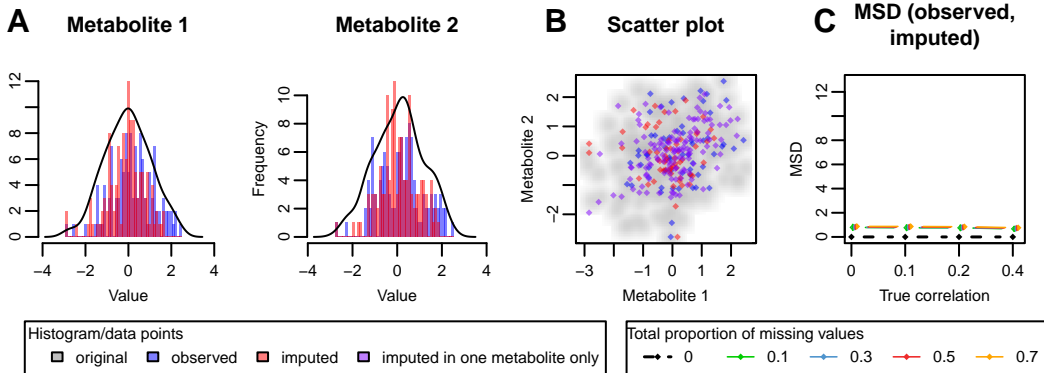
Power logistic regr.

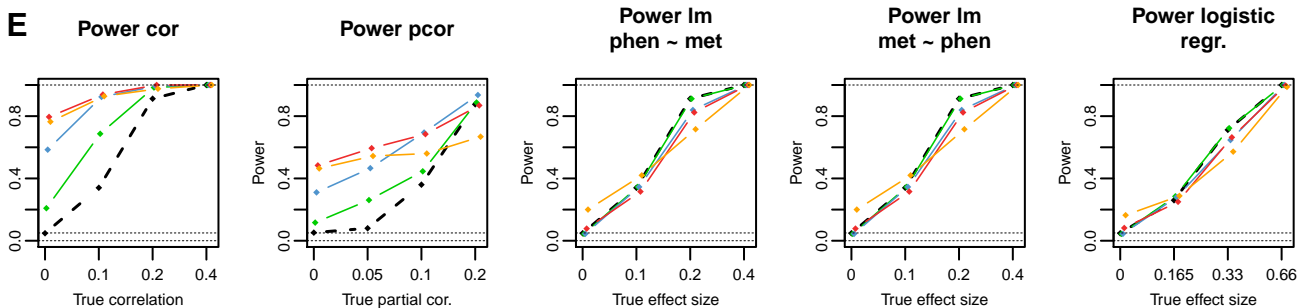
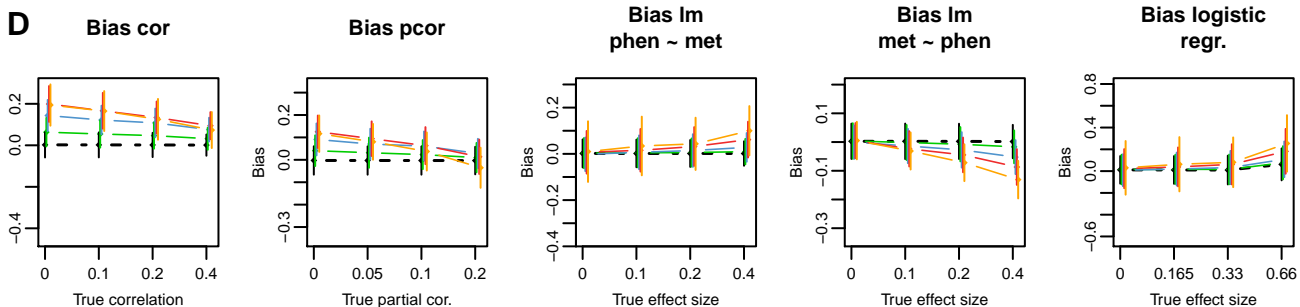
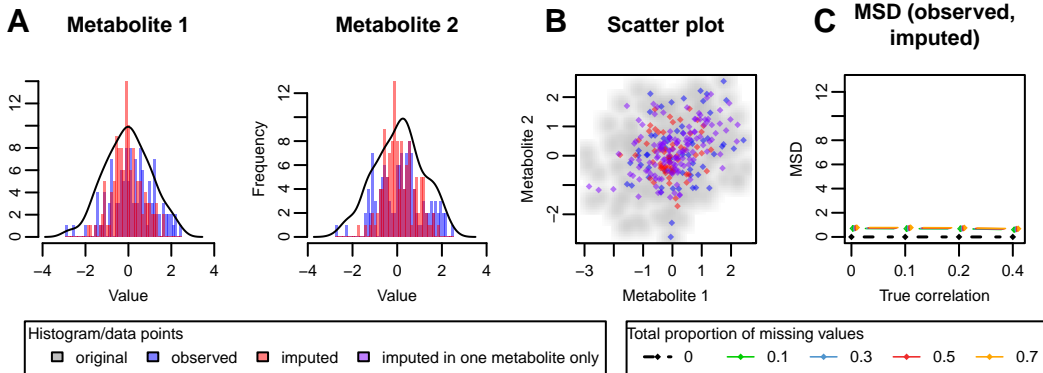


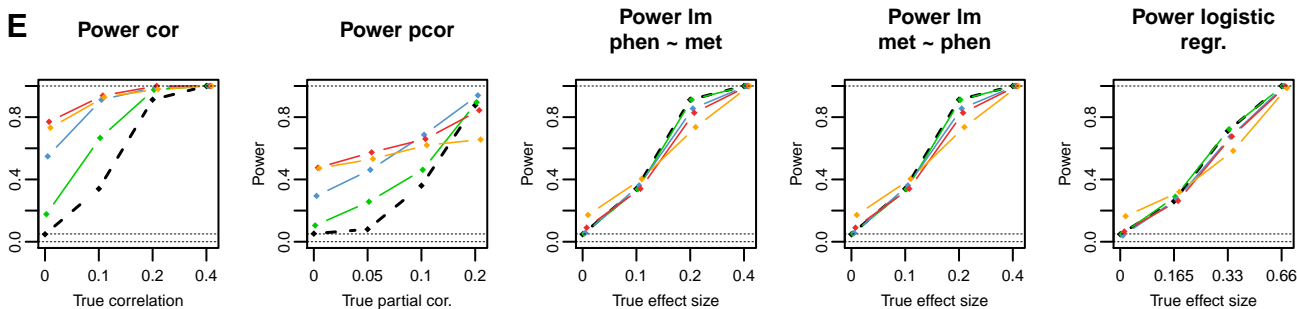
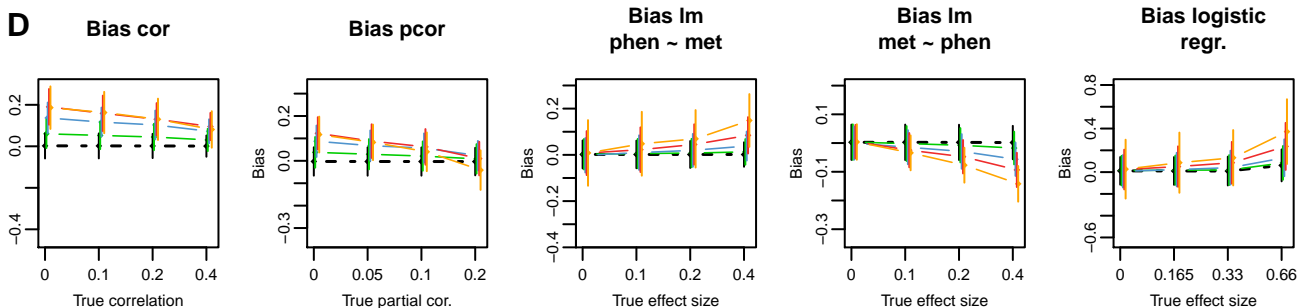
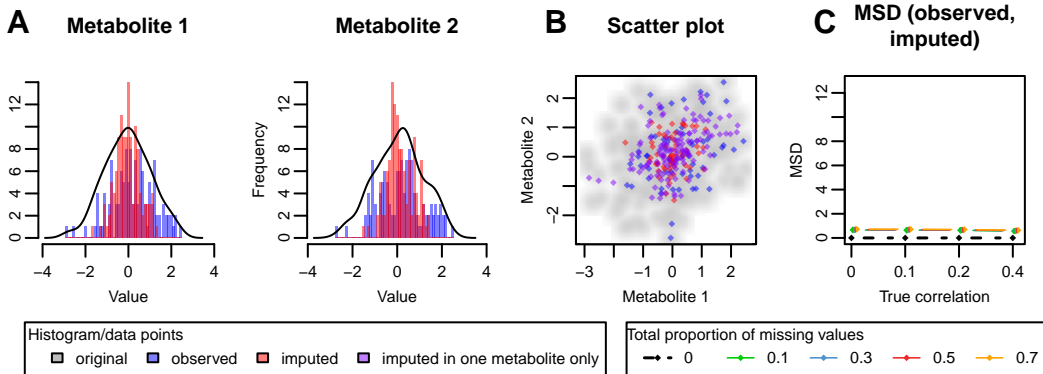


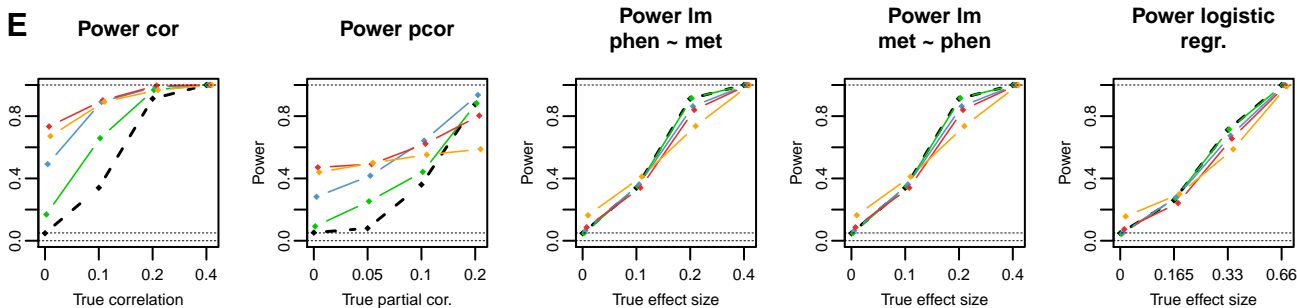
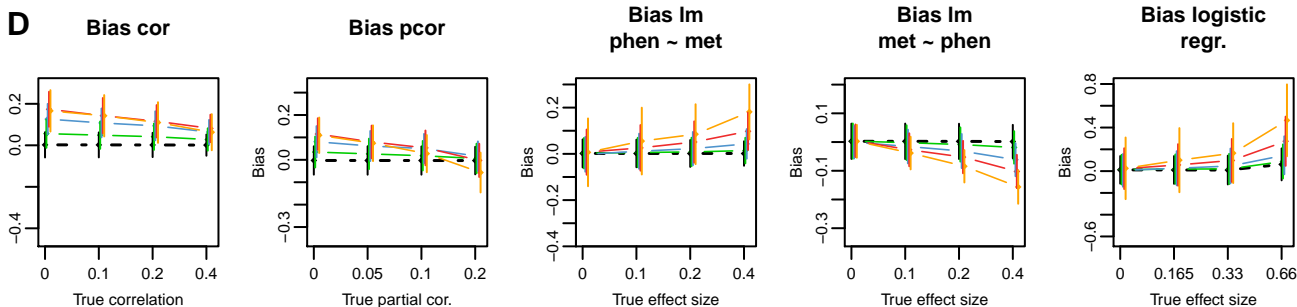
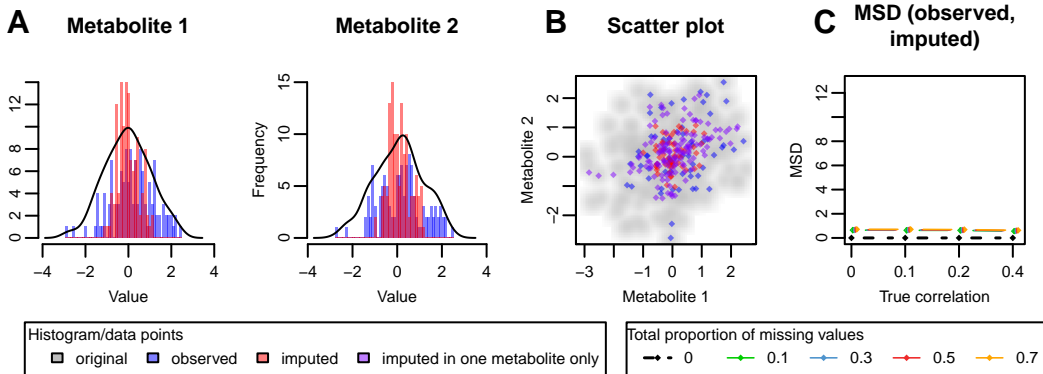


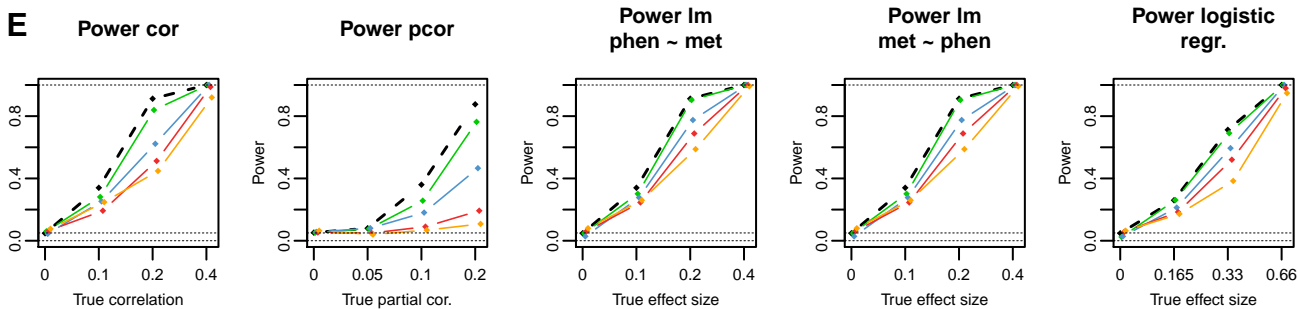
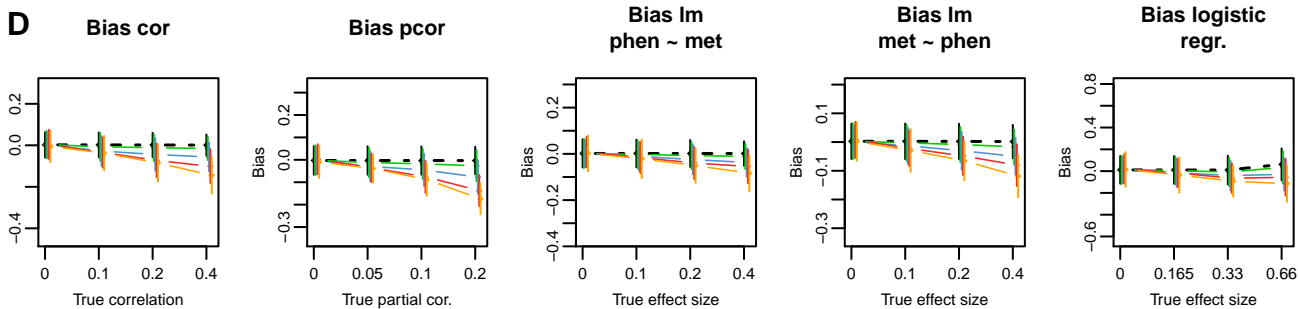
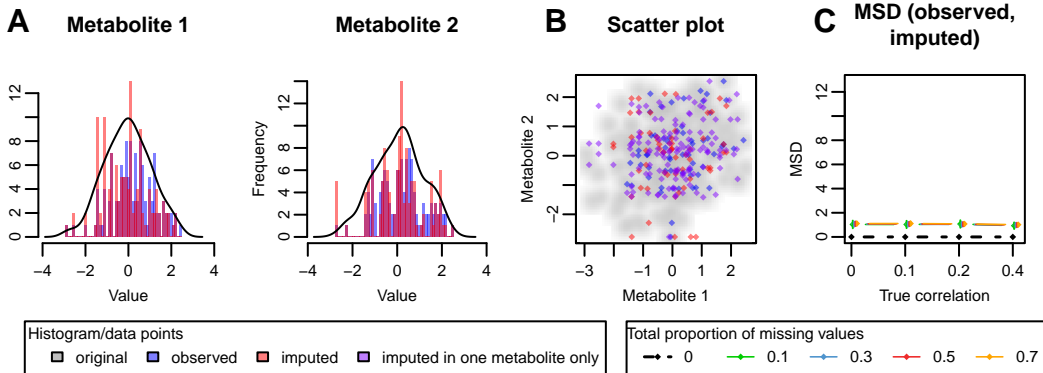


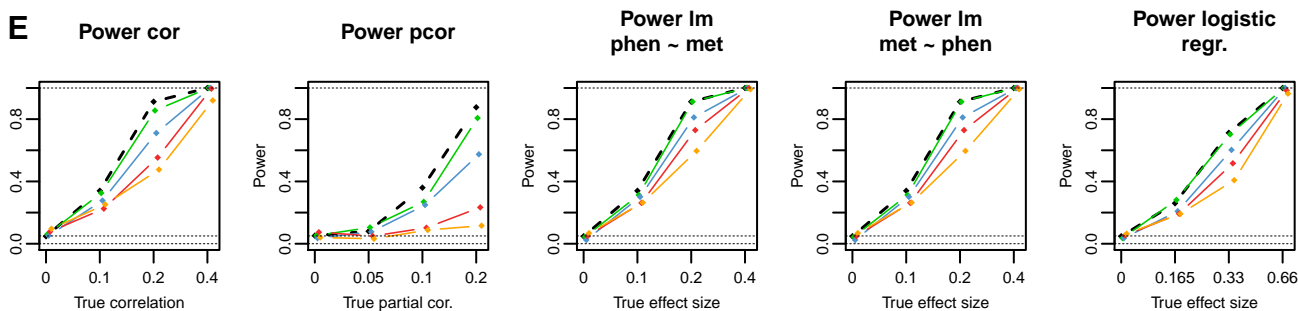
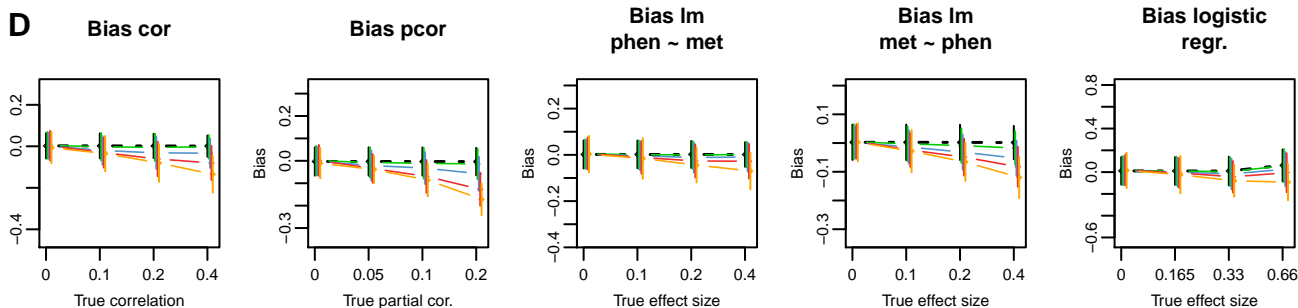
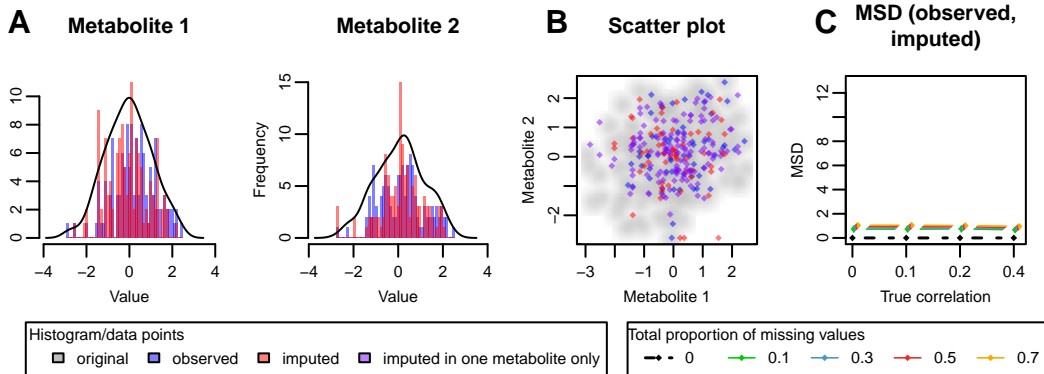


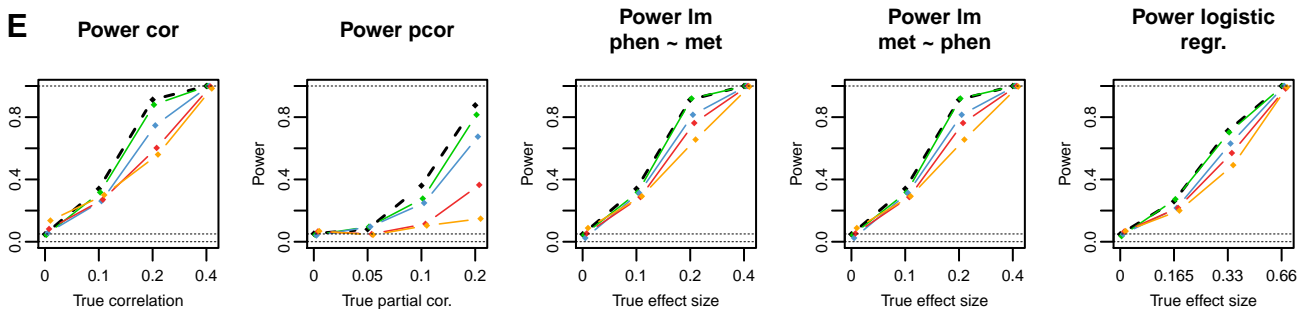
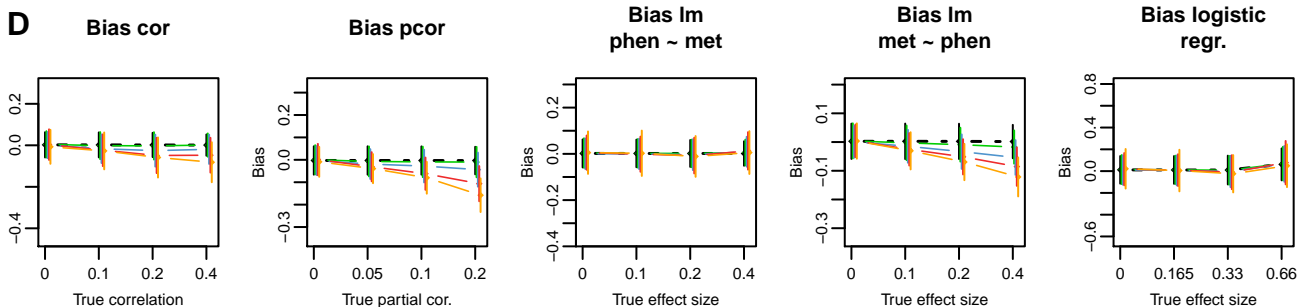
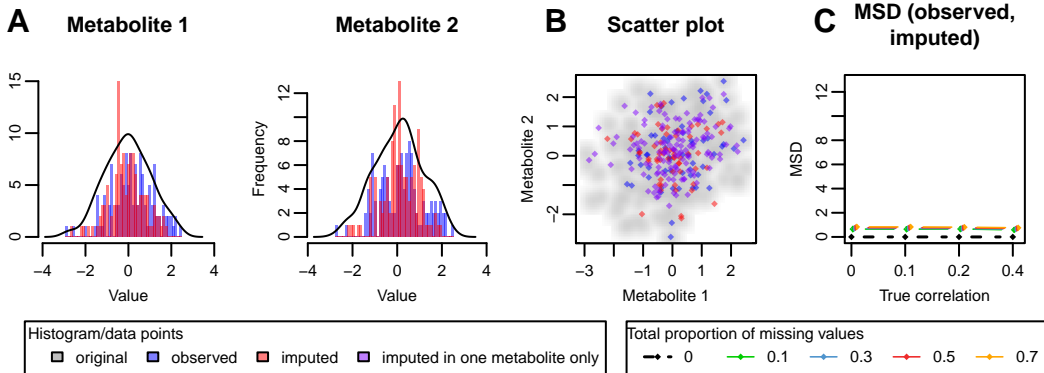


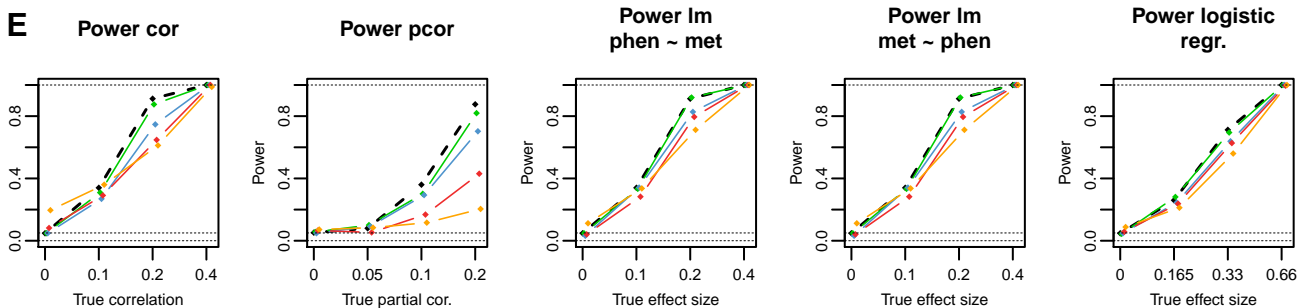
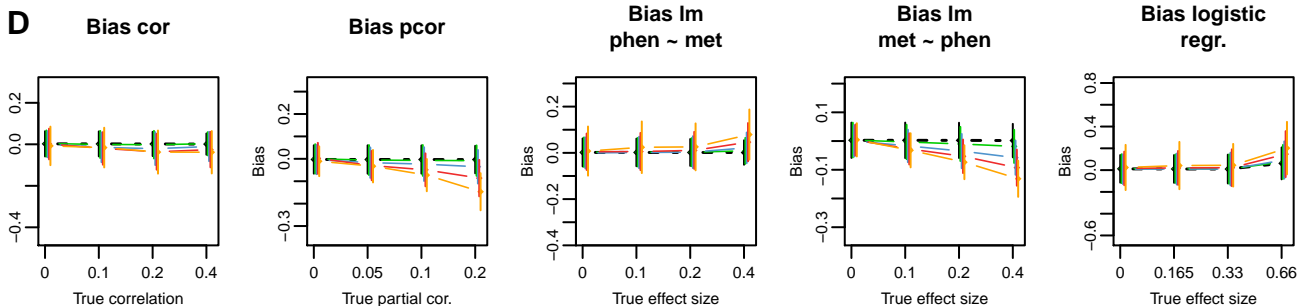
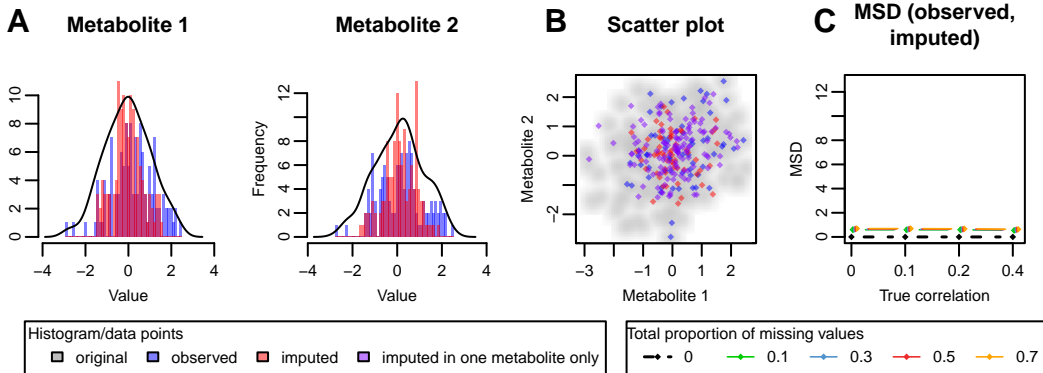


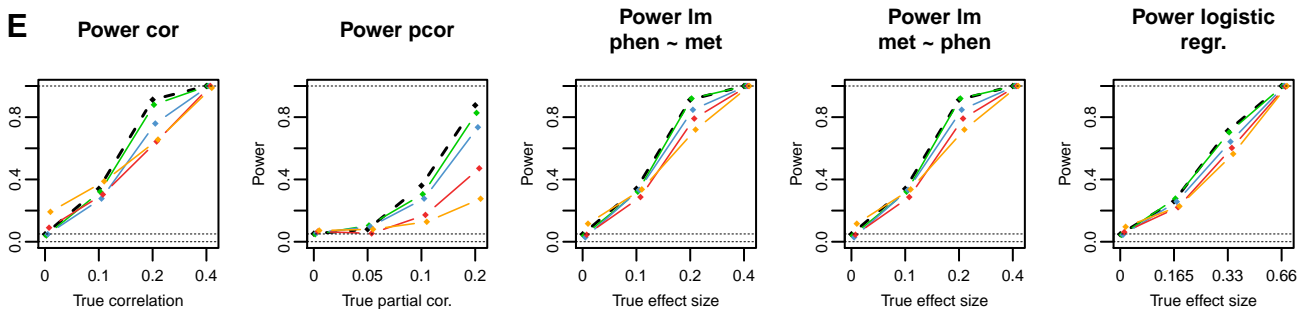
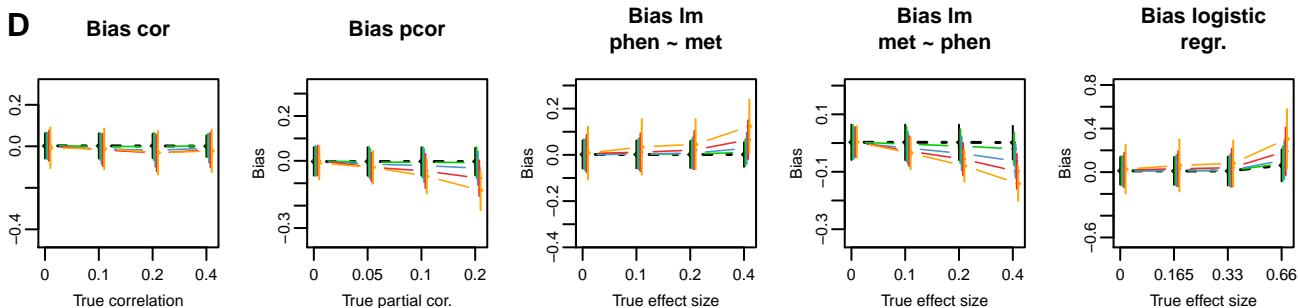
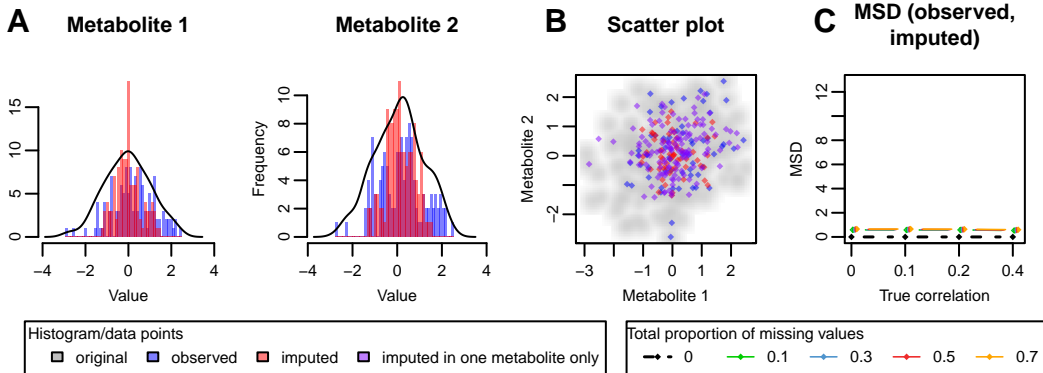


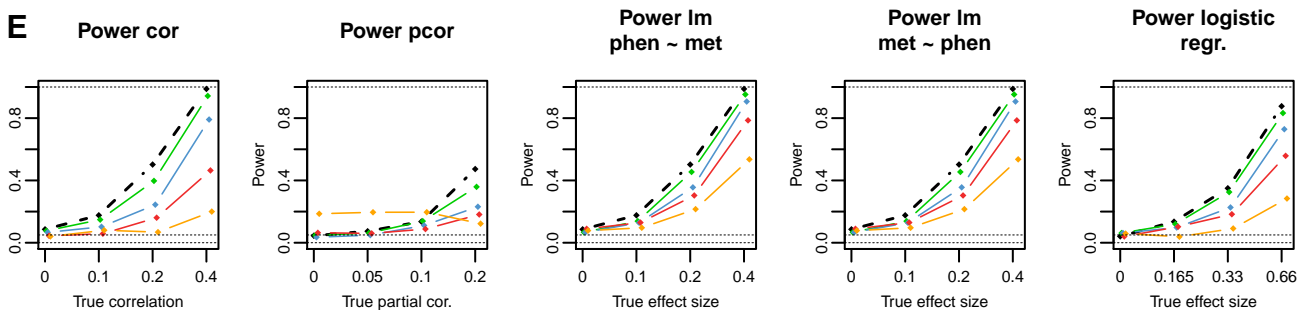
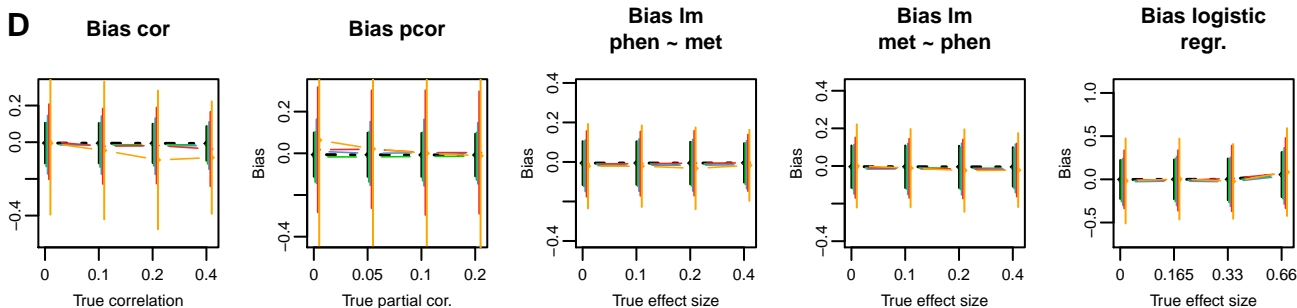
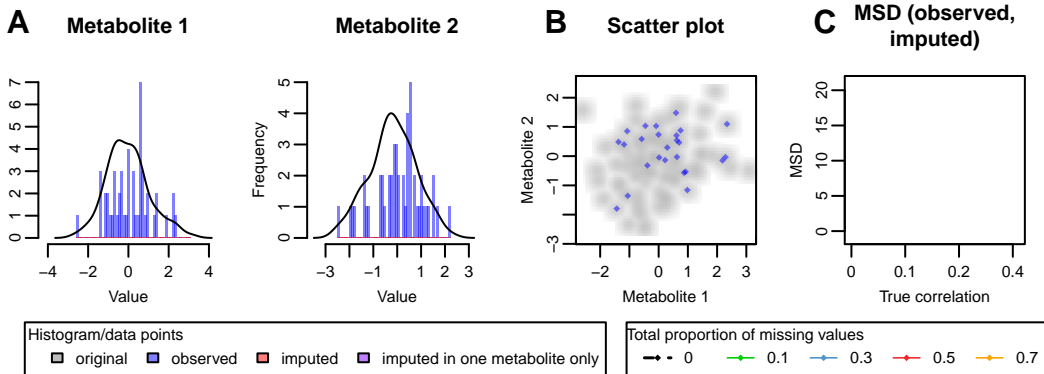


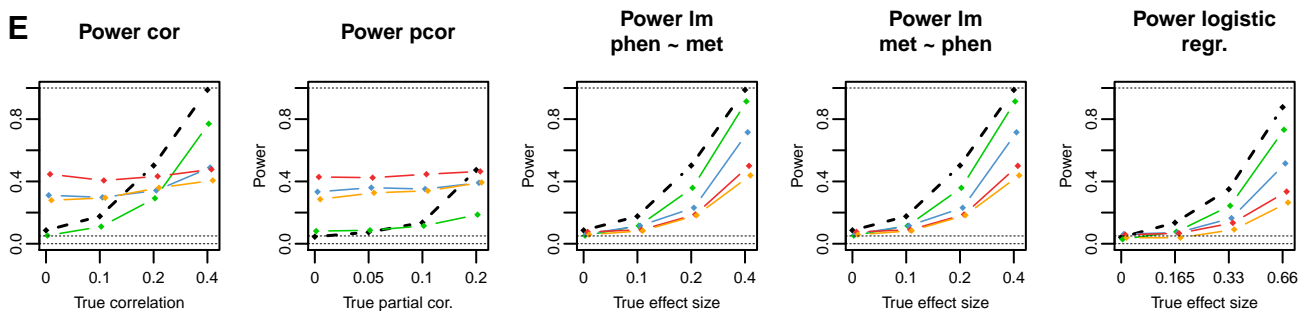
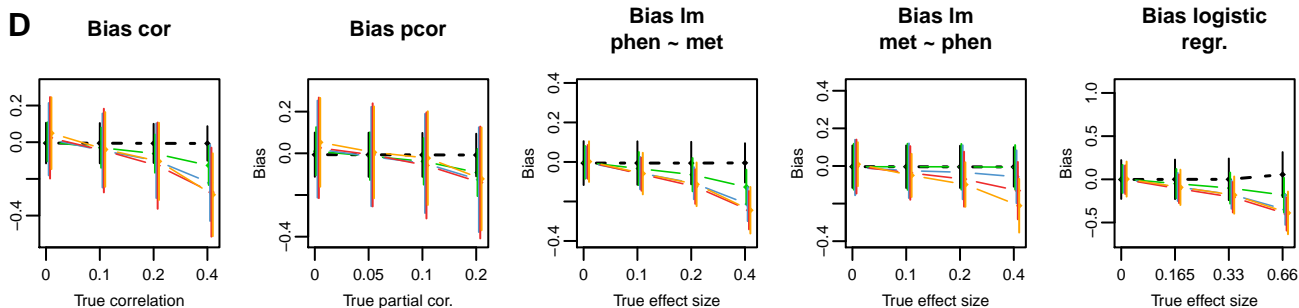
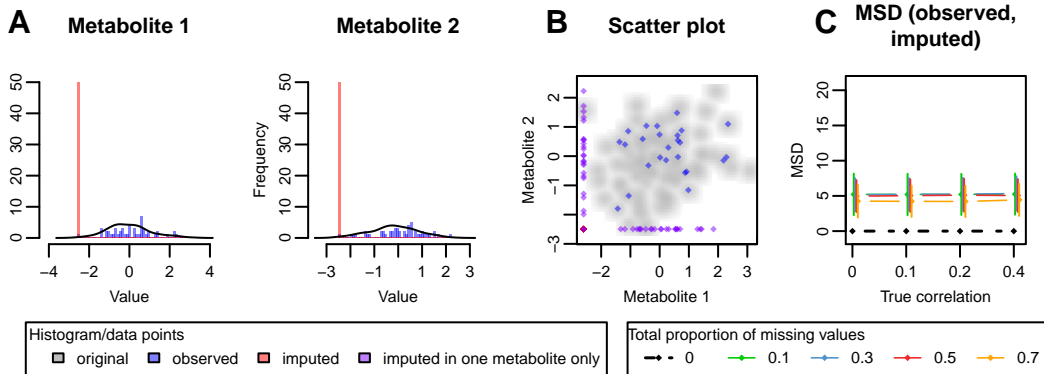


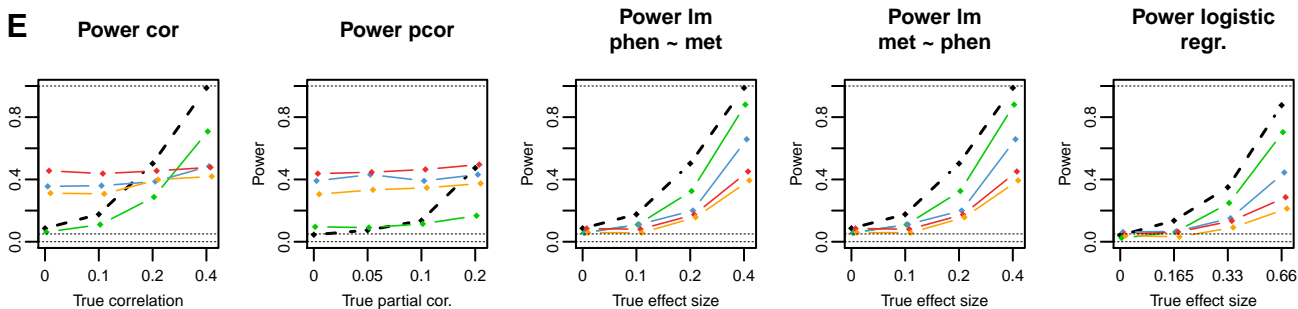
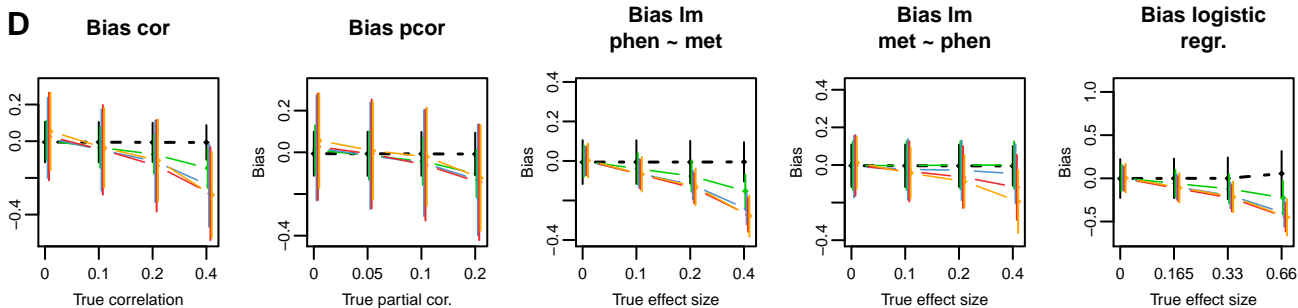
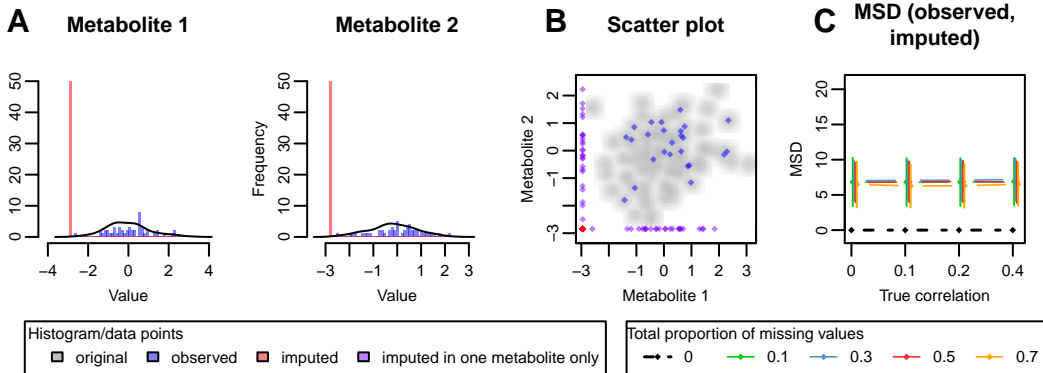


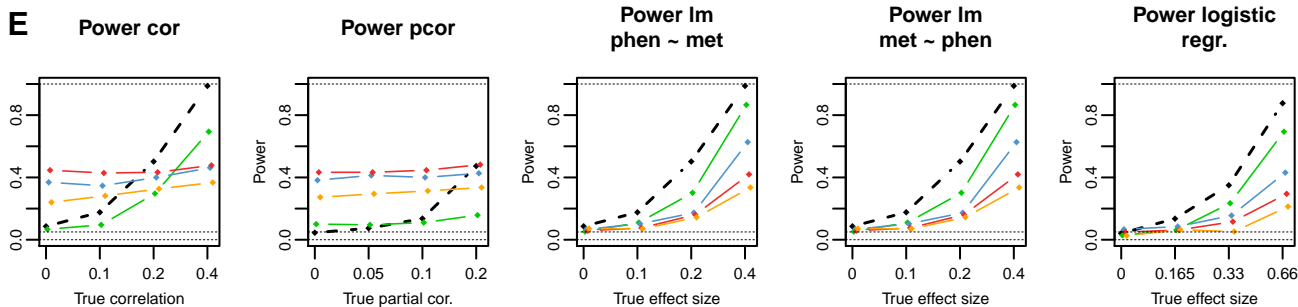
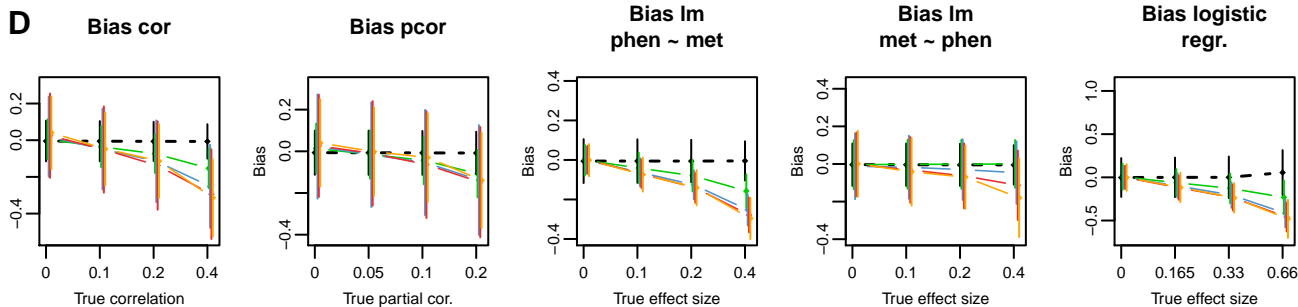
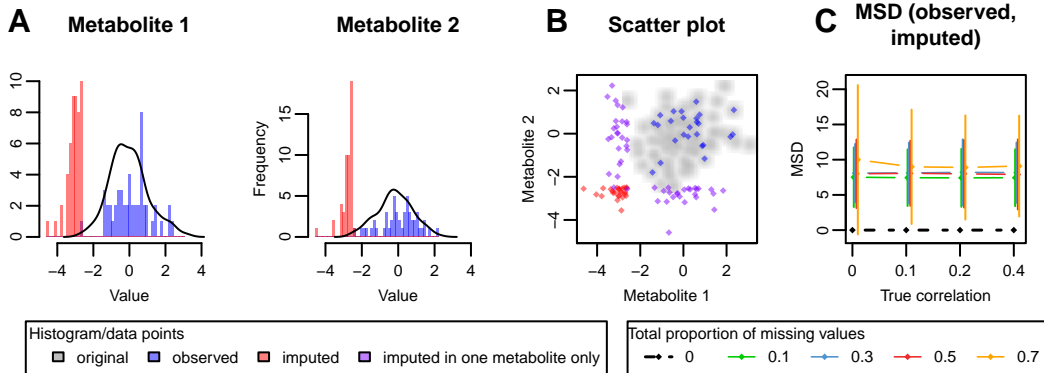


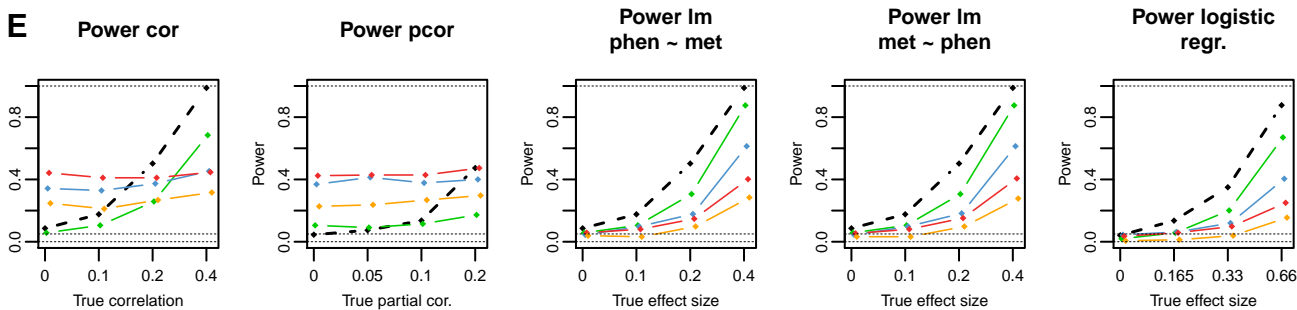
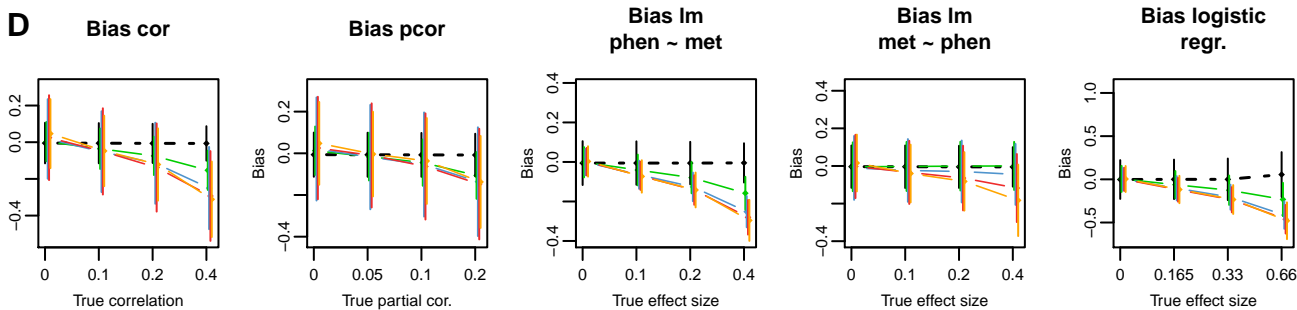
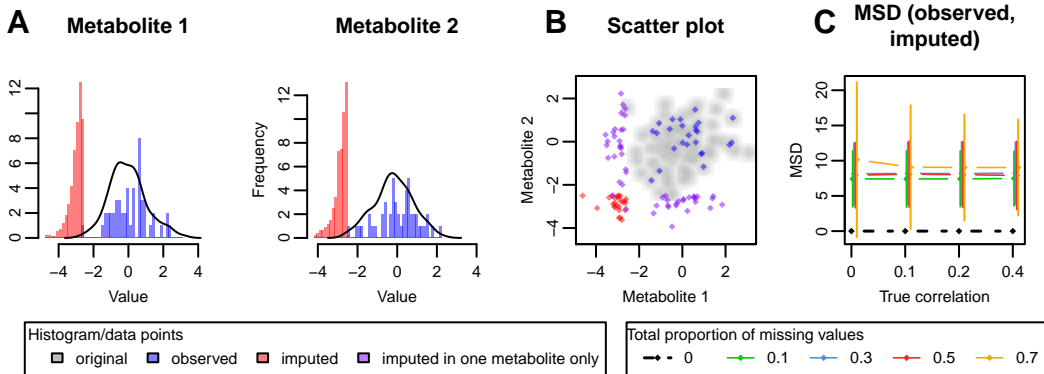


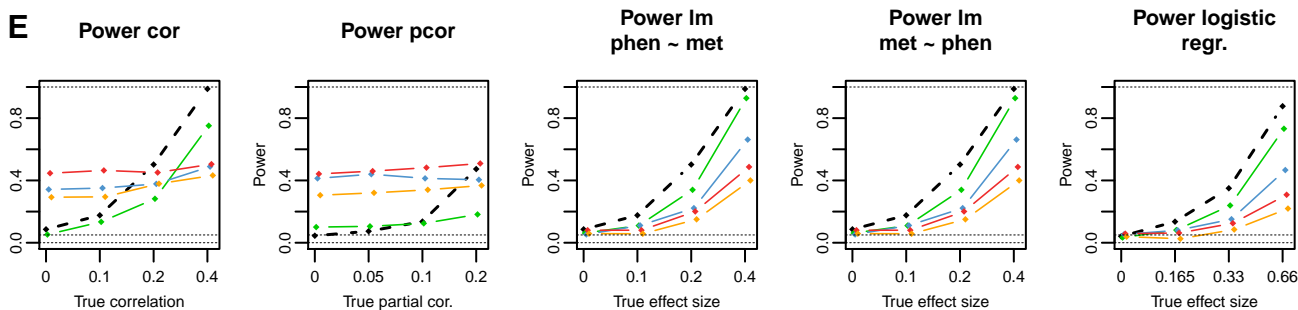
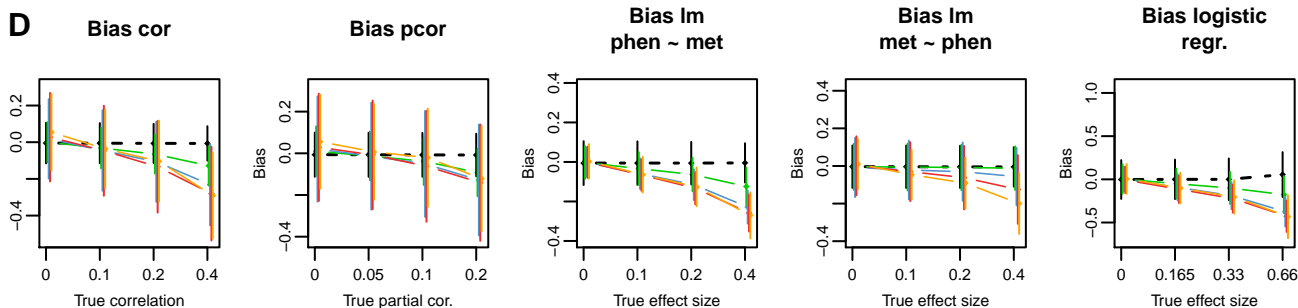
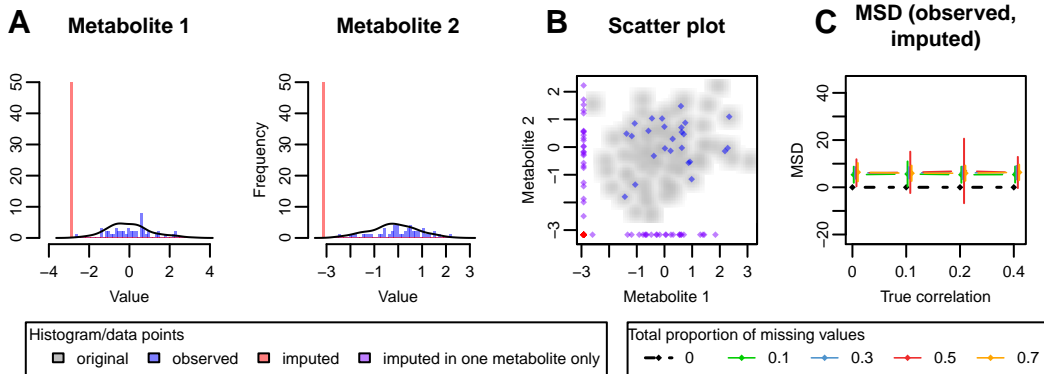


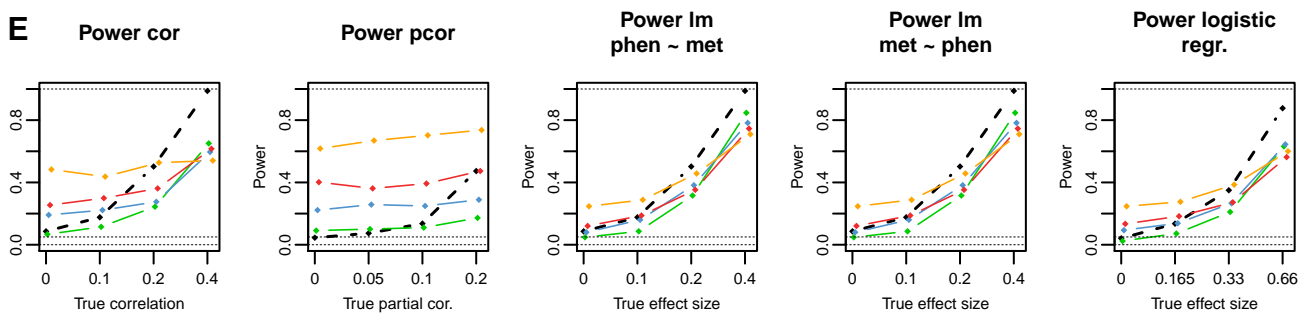
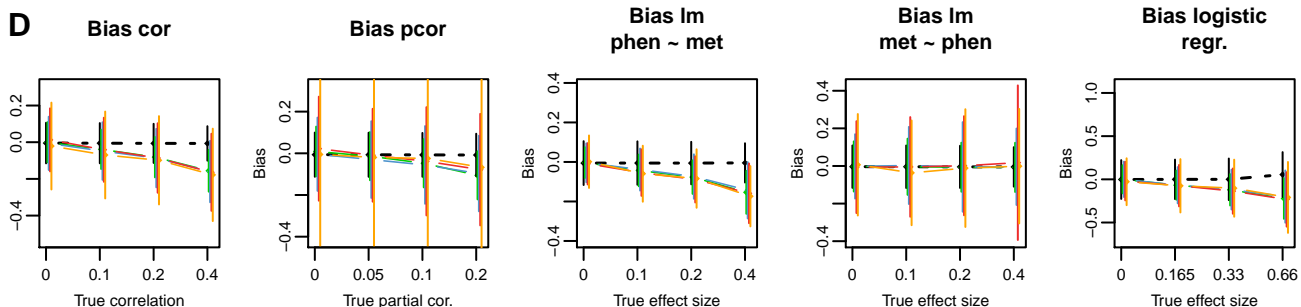
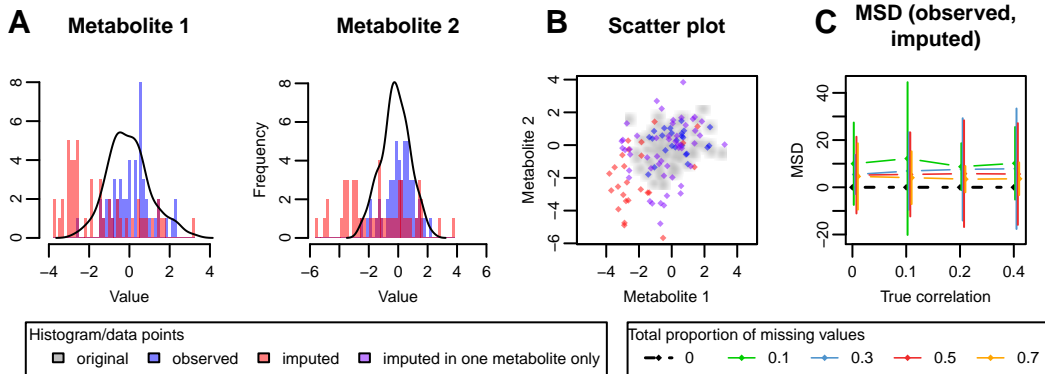




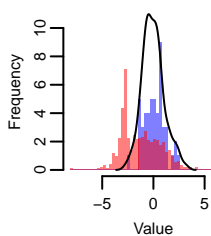




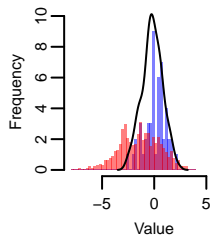




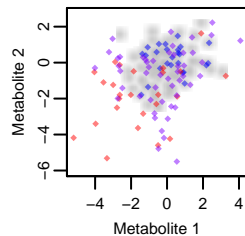
A Metabolite 1



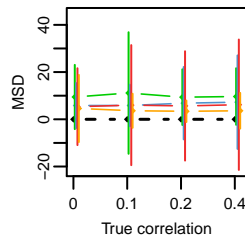
Metabolite 2



B Scatter plot



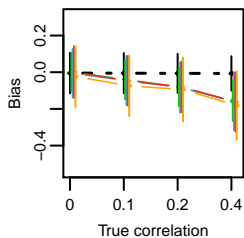
C MSD (observed, imputed)



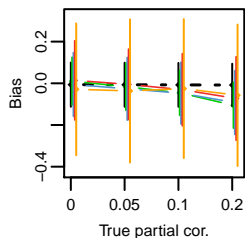
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 - - 0 - - 0.1 - - 0.3 - - 0.5 - - 0.7

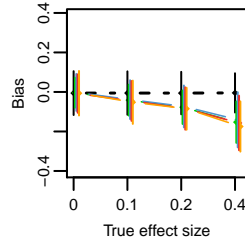
D Bias cor



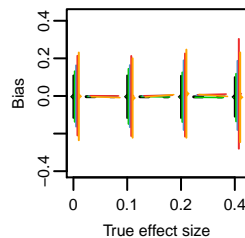
Bias pcor



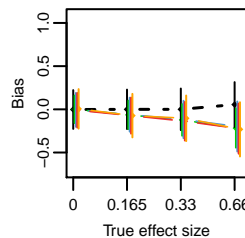
Bias Im phen ~ met



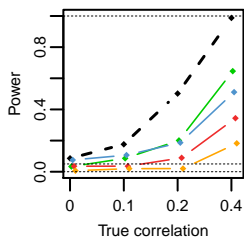
Bias Im met ~ phen



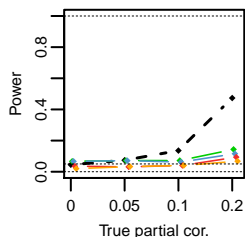
Bias logistic regr.



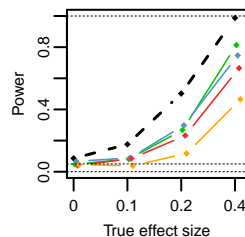
E Power cor



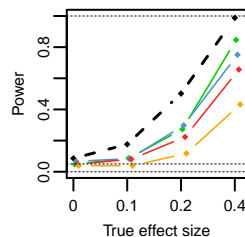
Power pcor



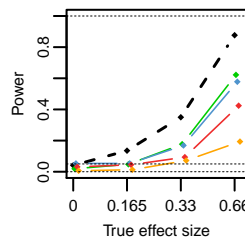
Power Im phen ~ met

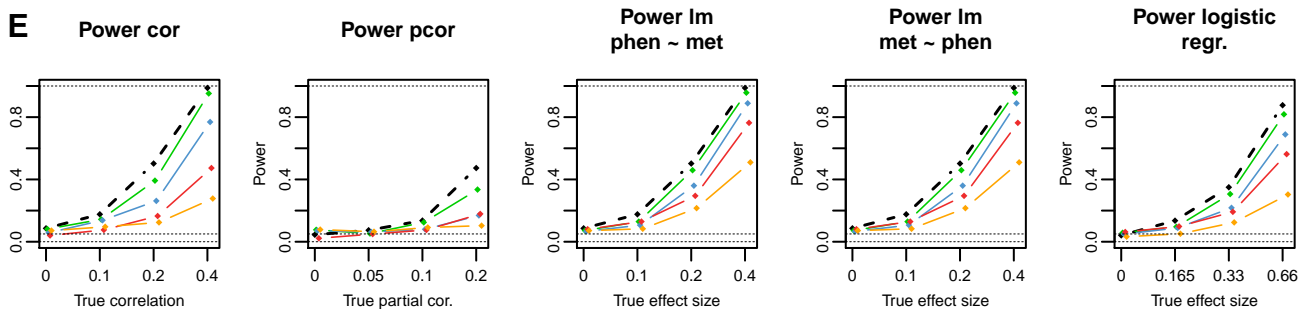
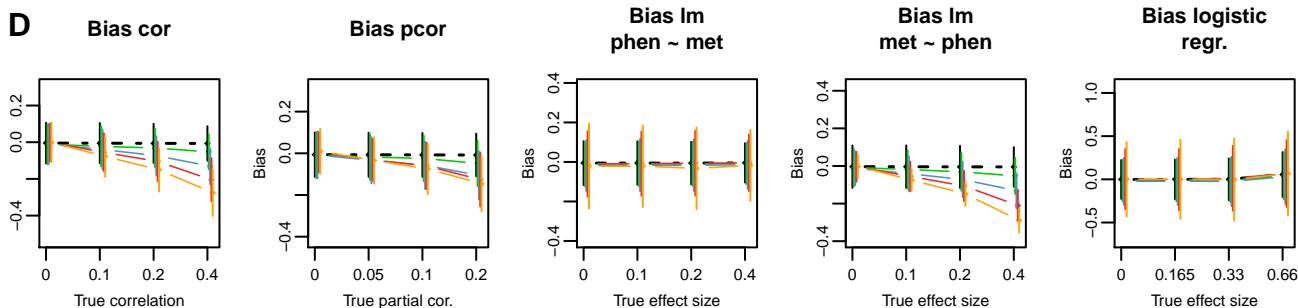
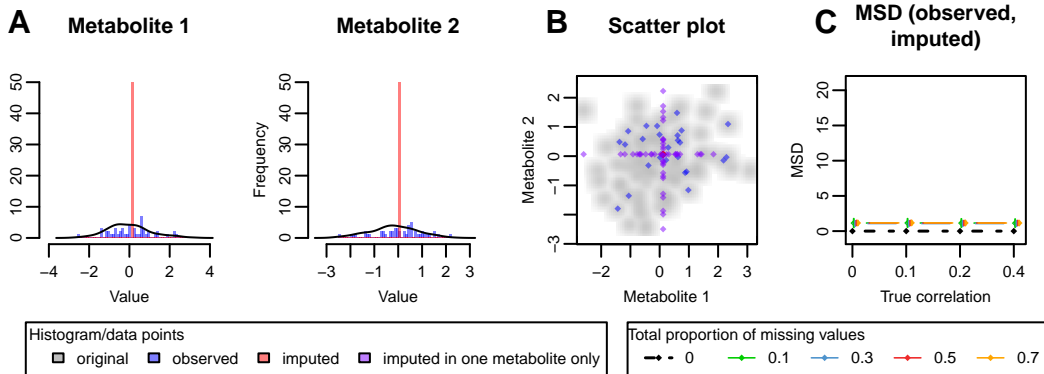


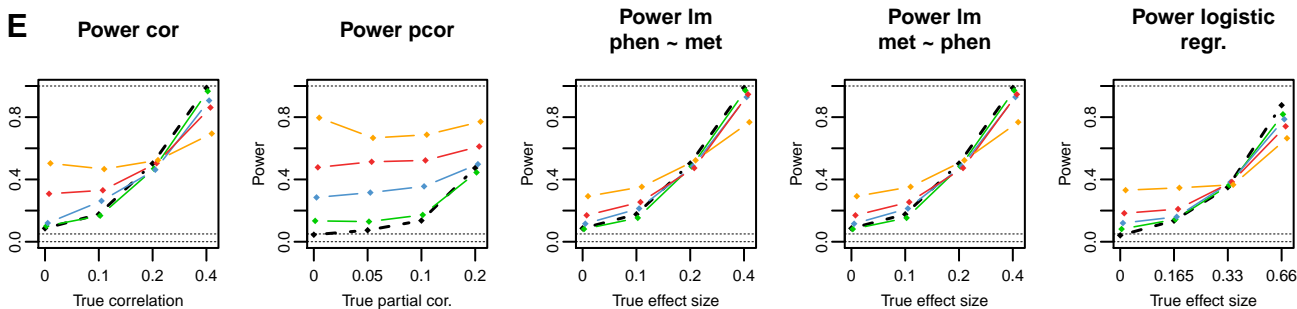
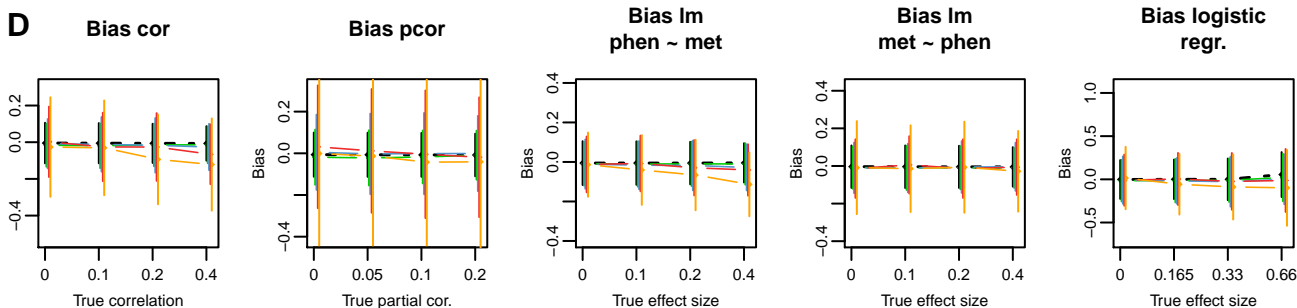
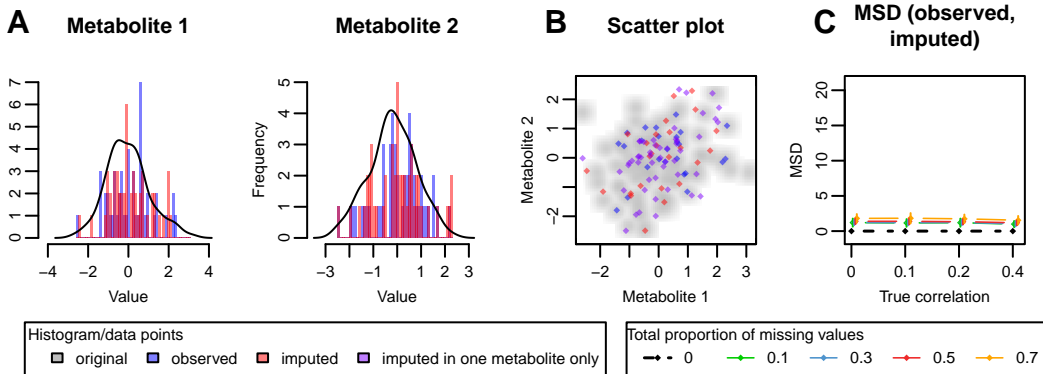
Power Im met ~ phen



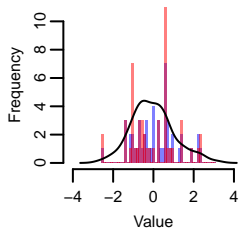
Power logistic regr.



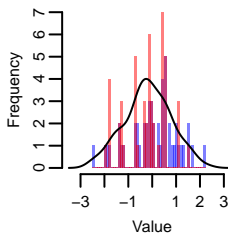




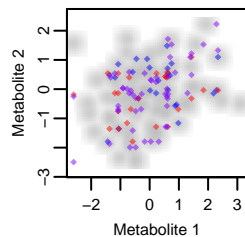
A Metabolite 1



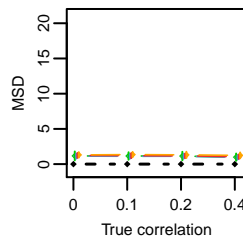
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



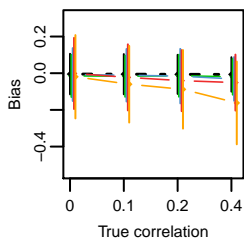
Histogram/data points

original observed imputed imputed in one metabolite only

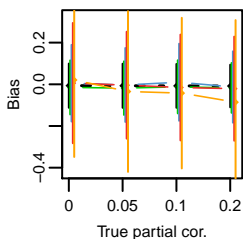
Total proportion of missing values

0 0.1 0.3 0.5 0.7

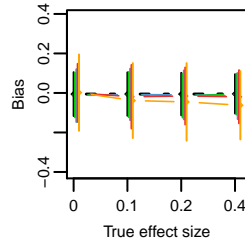
D Bias cor



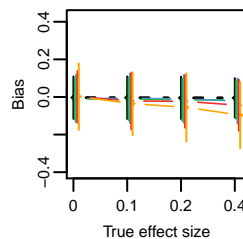
Bias pcor



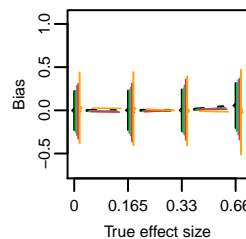
Bias lm phen ~ met



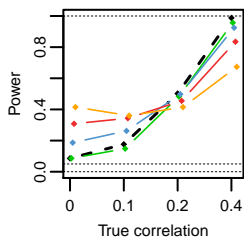
Bias lm met ~ phen



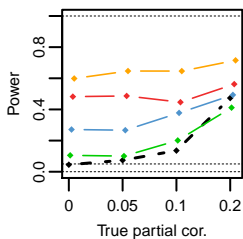
Bias logistic regr.



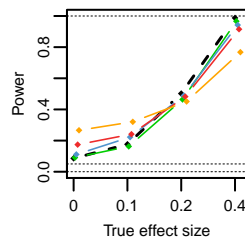
E Power cor



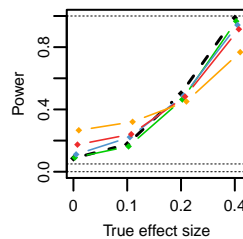
Power pcor



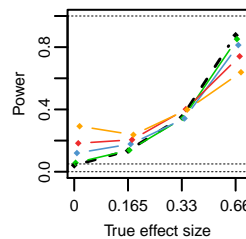
Power lm phen ~ met

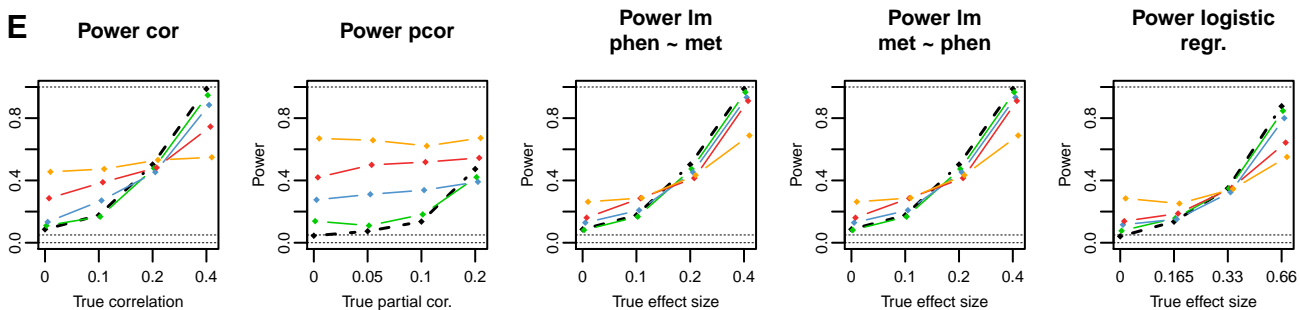
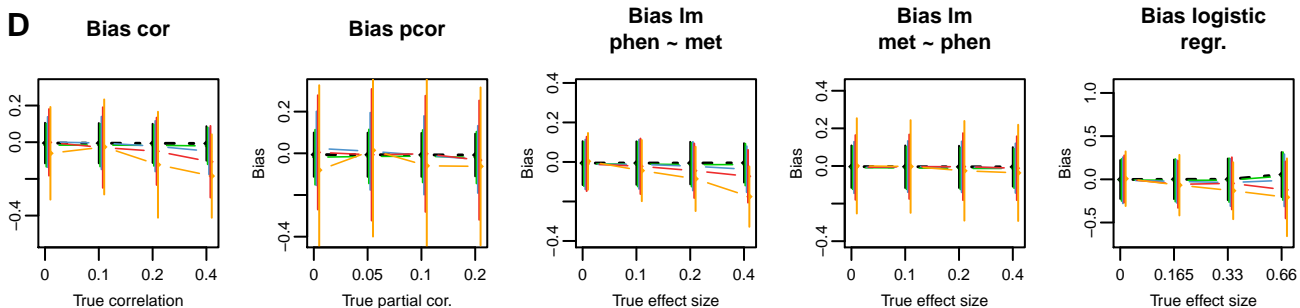
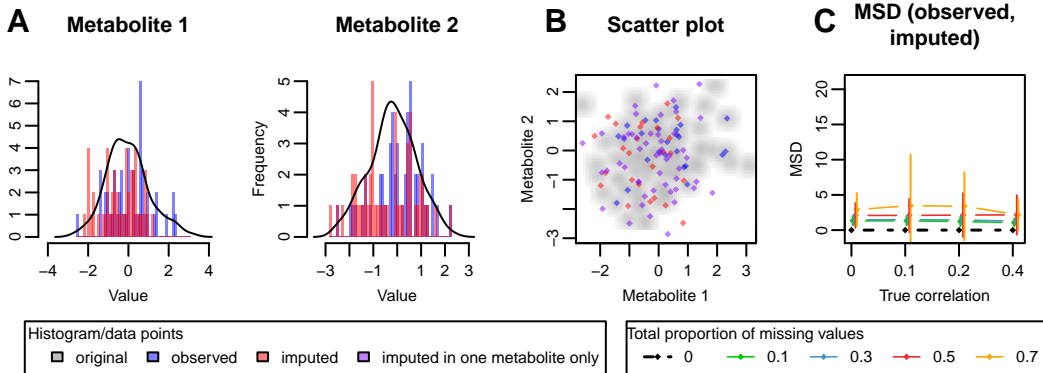


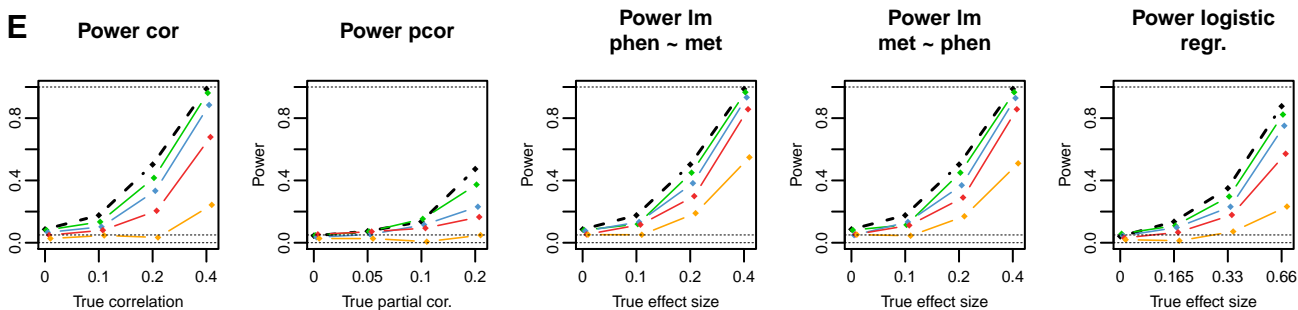
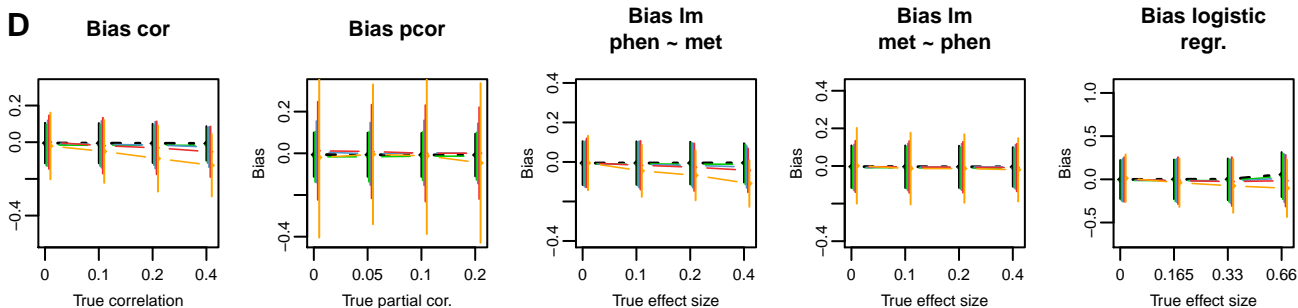
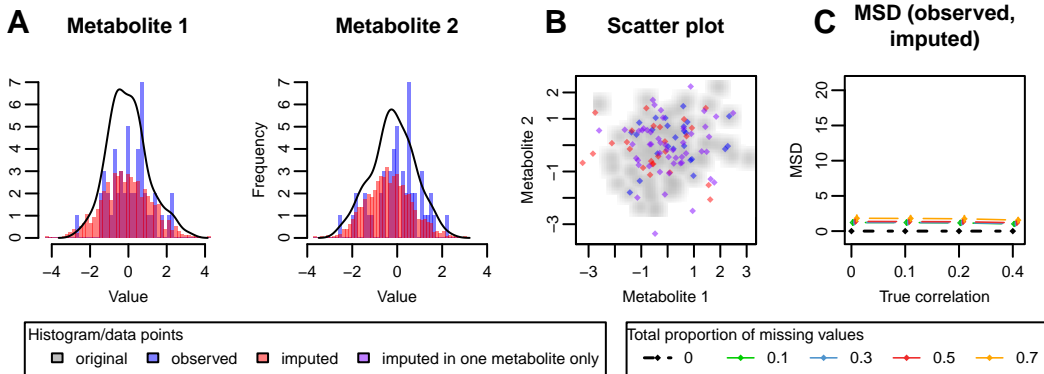
Power lm met ~ phen

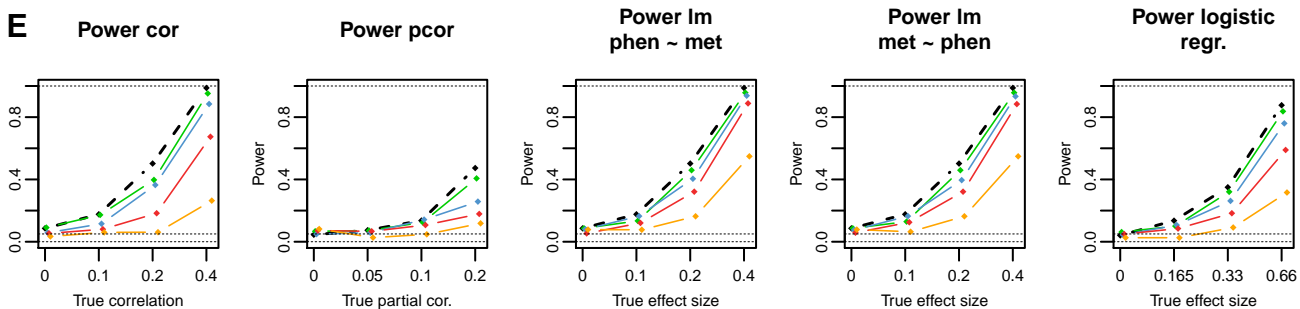
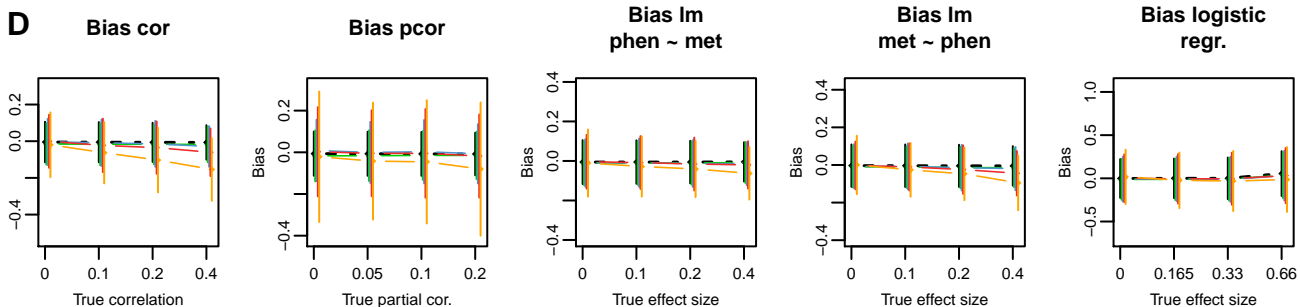
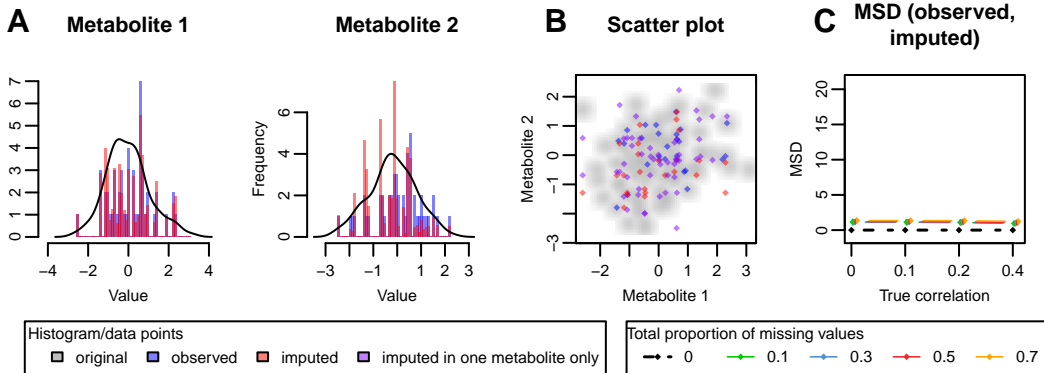


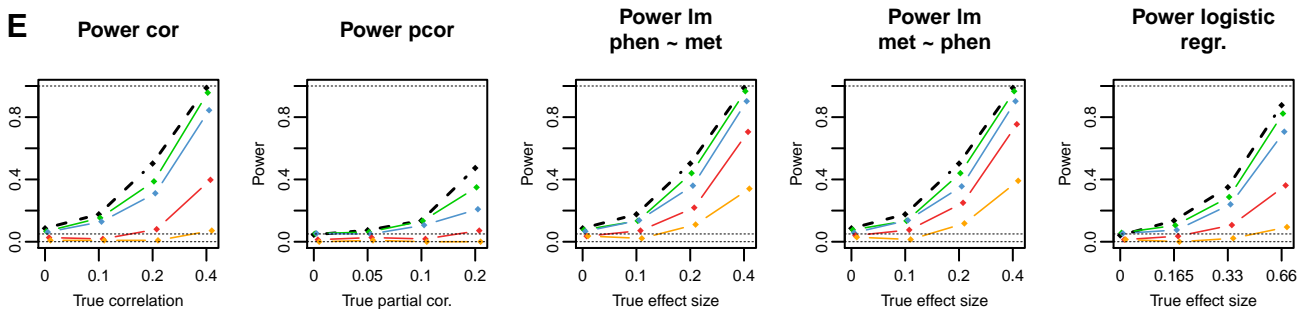
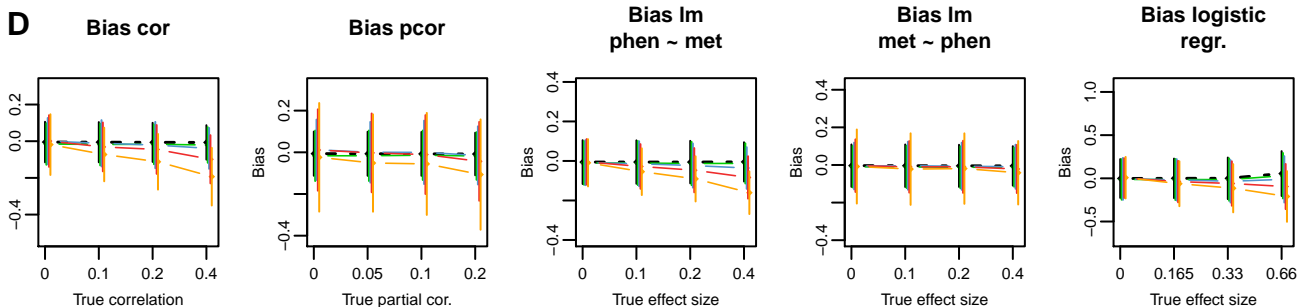
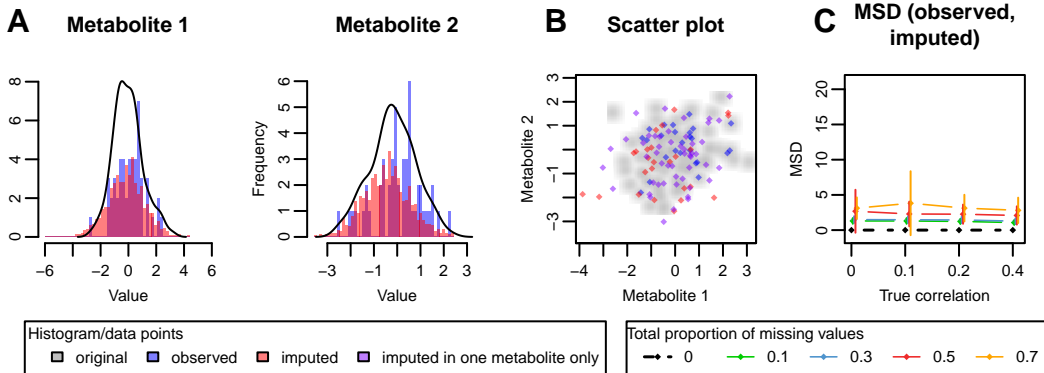
Power logistic regr.

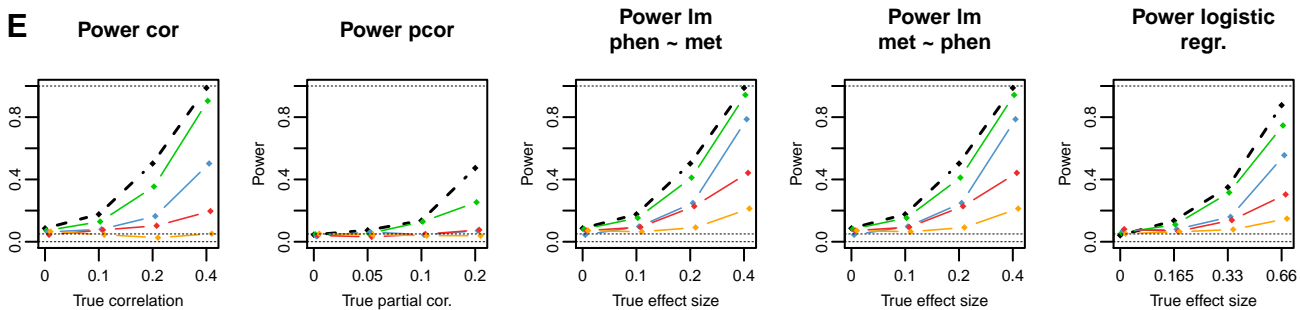
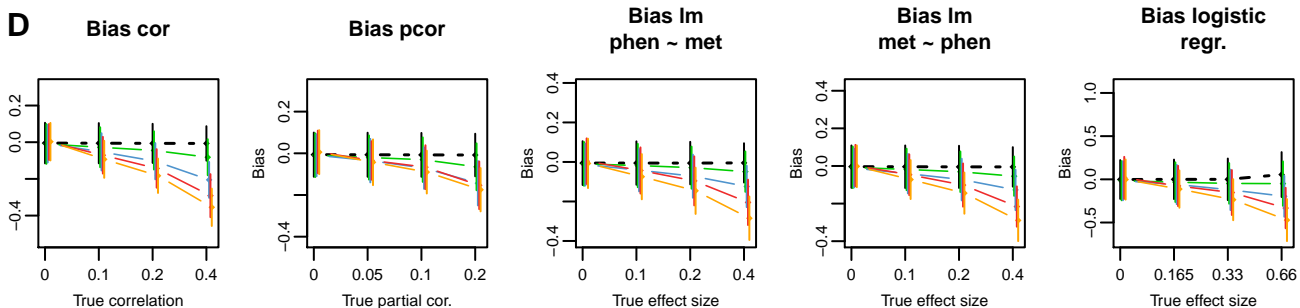
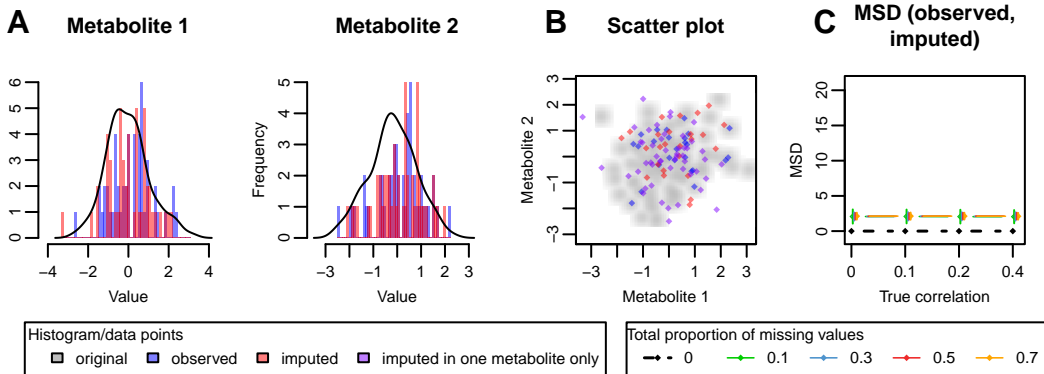


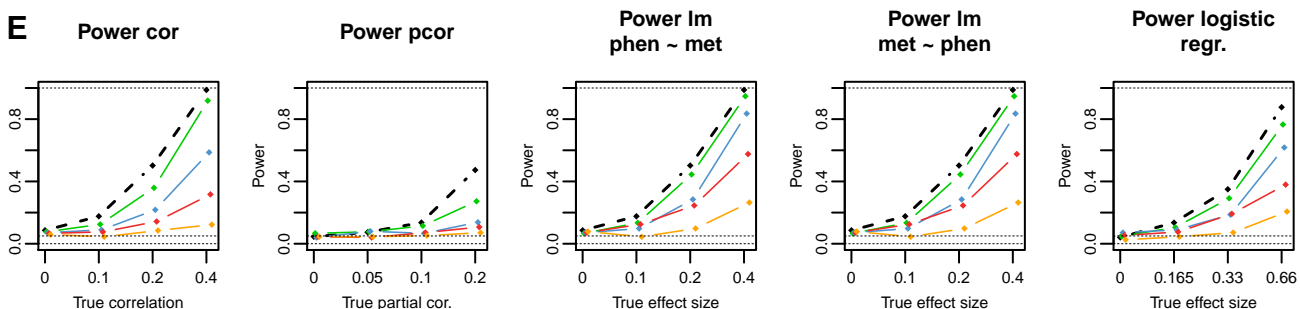
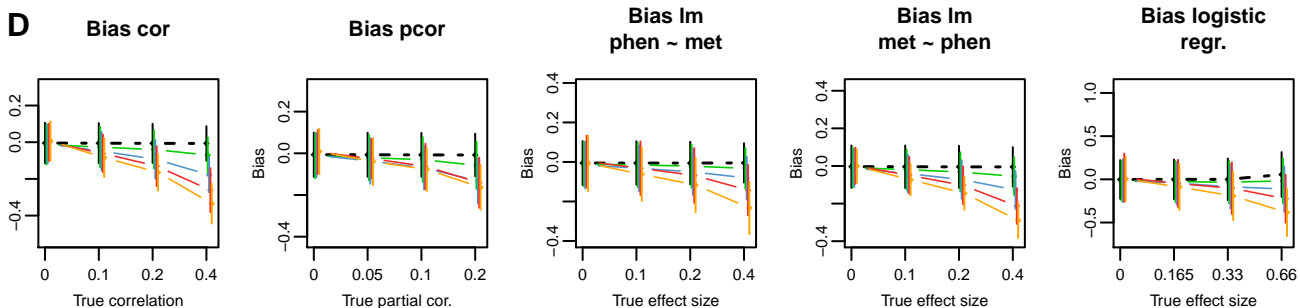
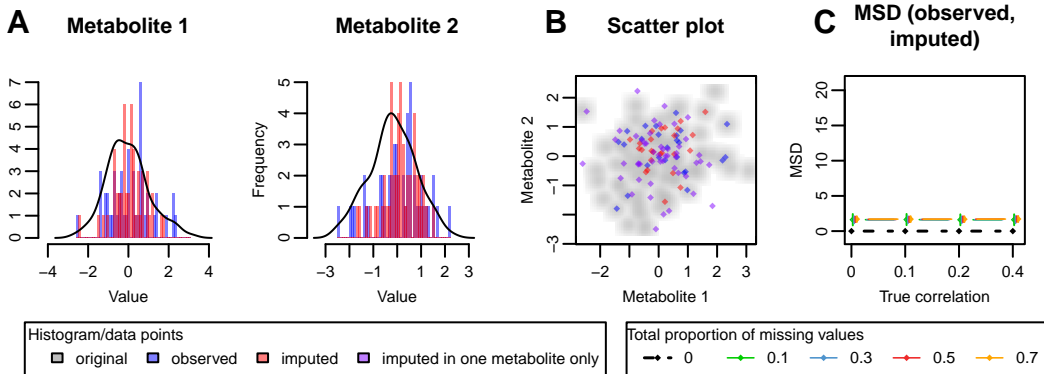


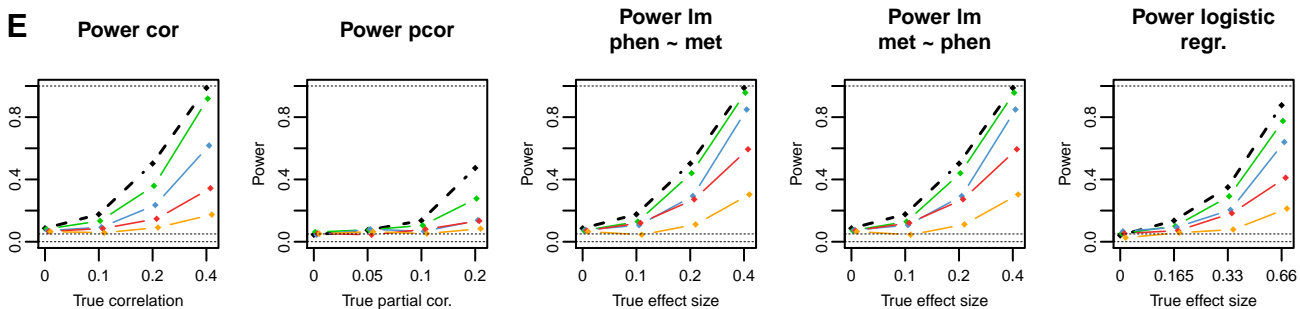
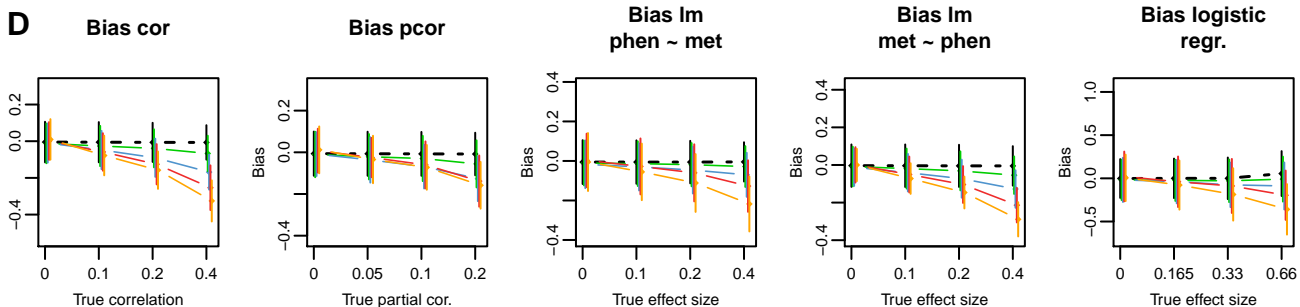
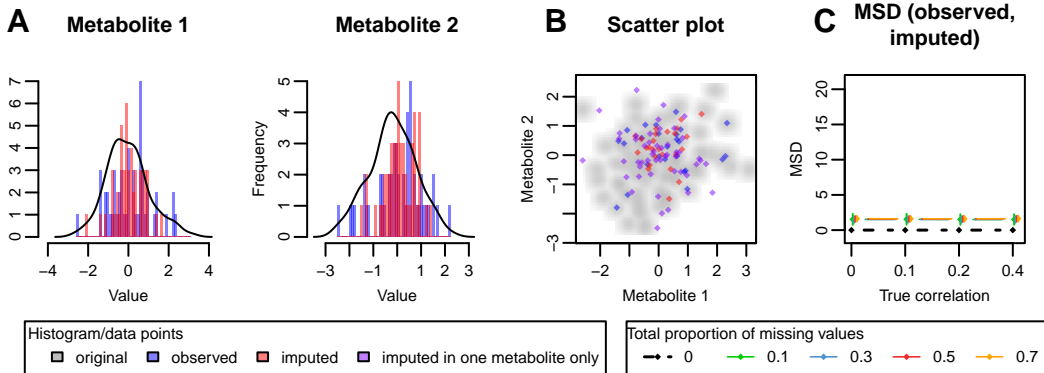


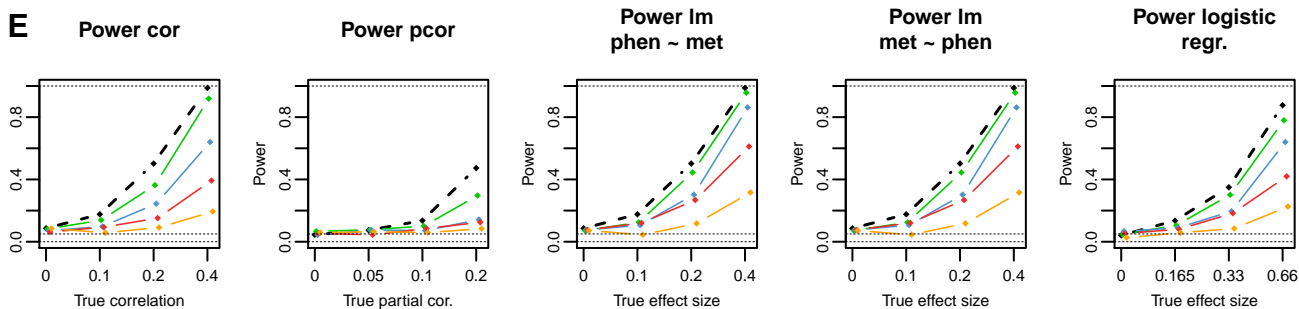
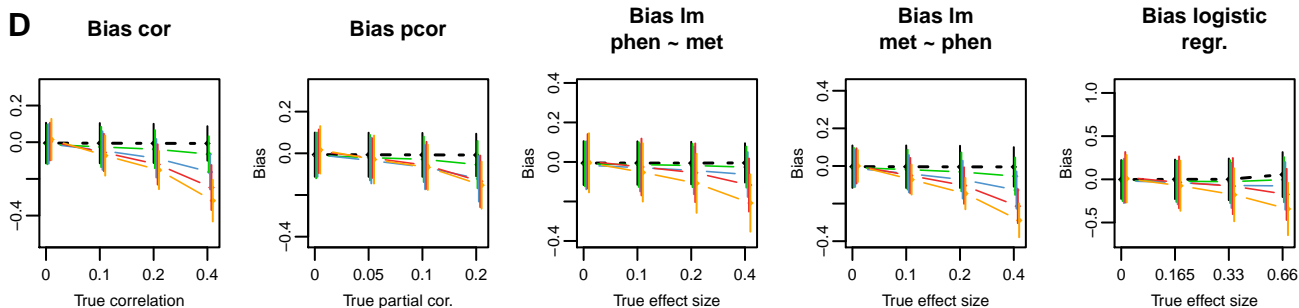
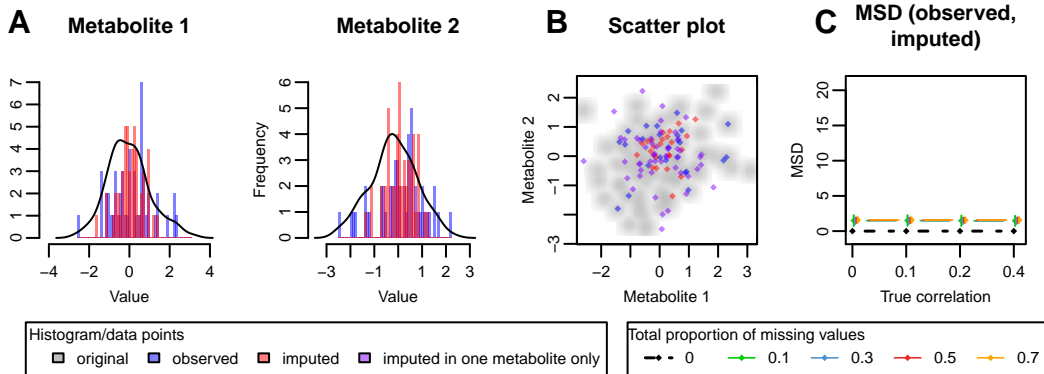


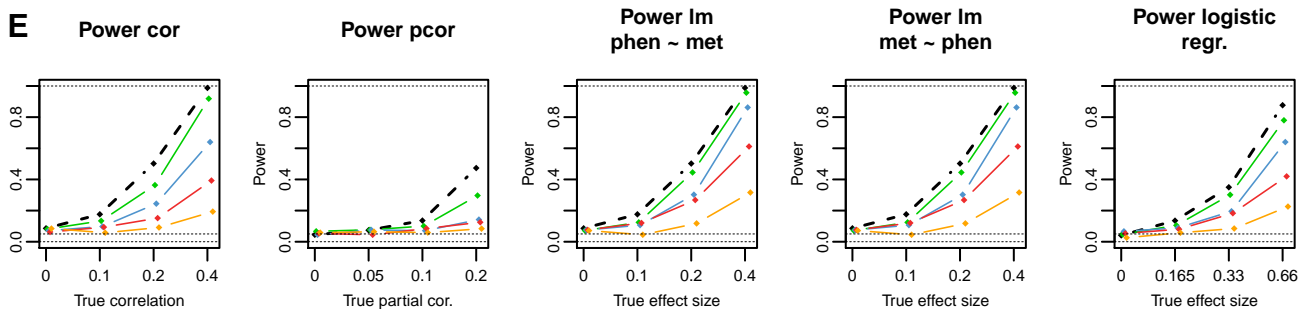
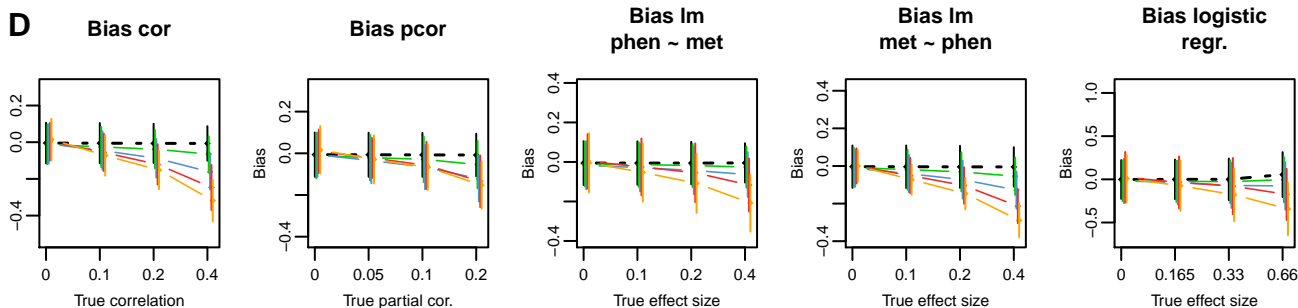
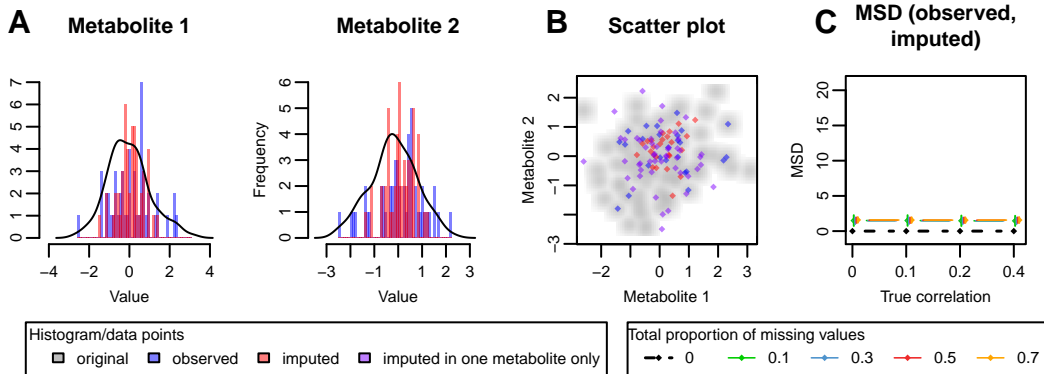


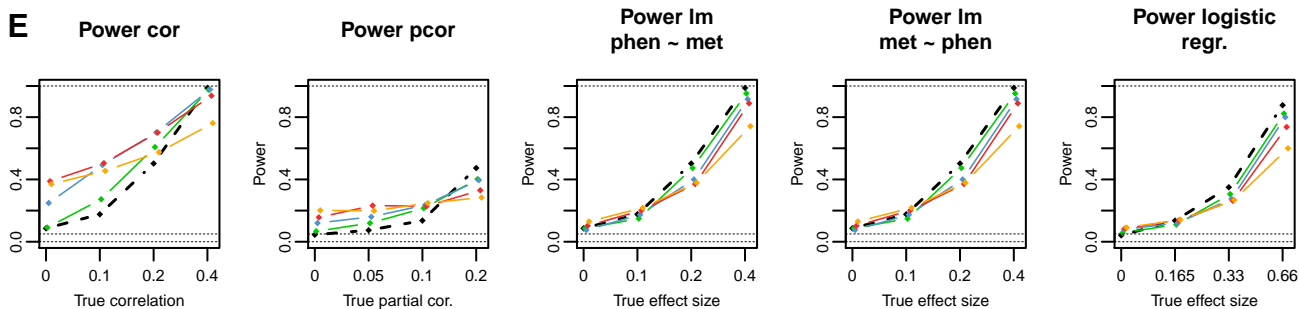
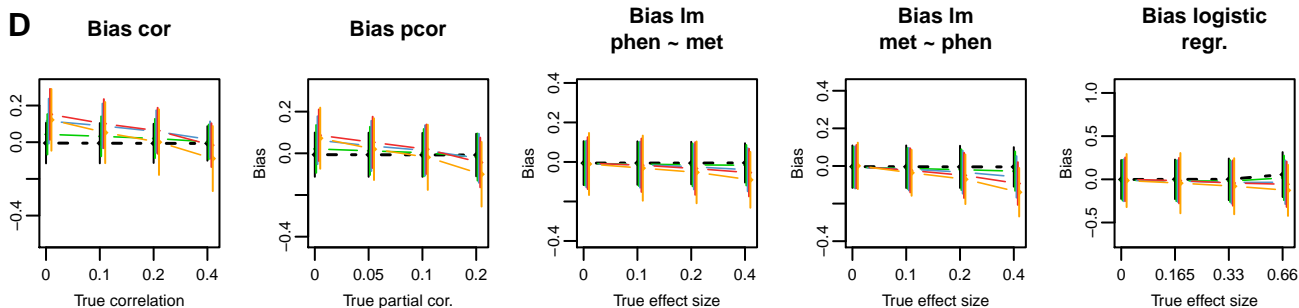
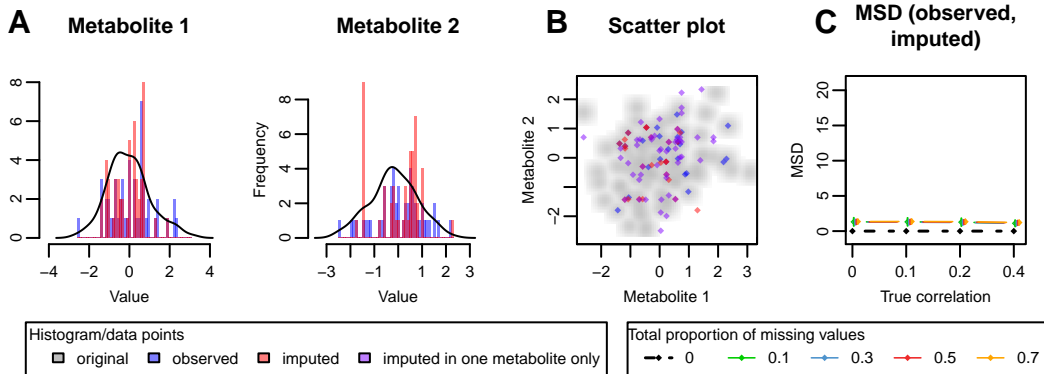


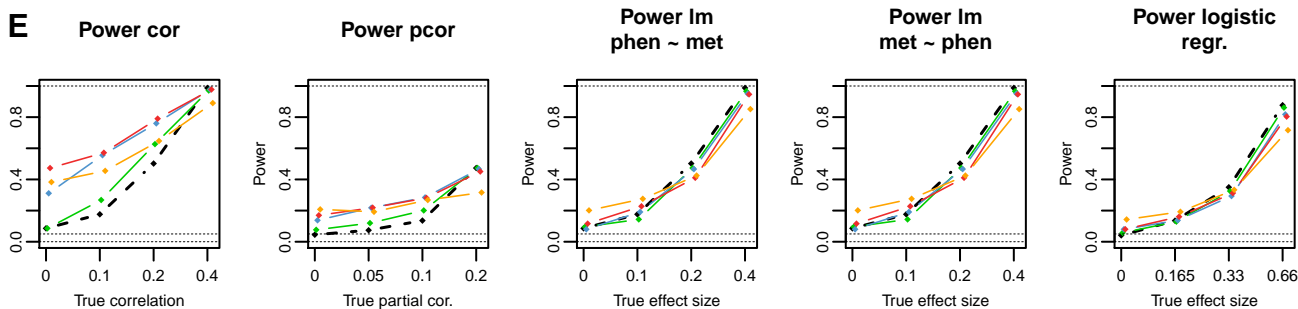
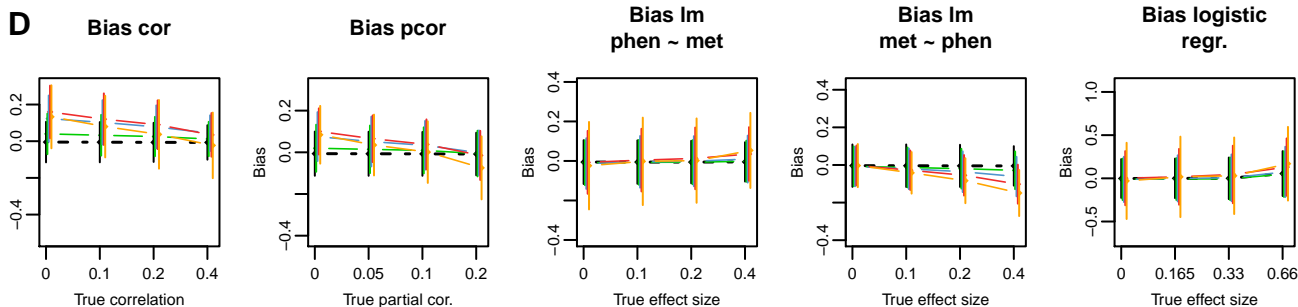
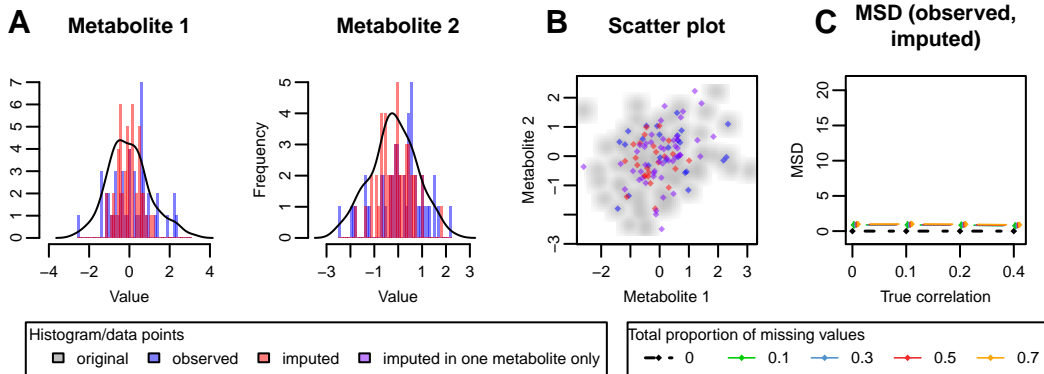


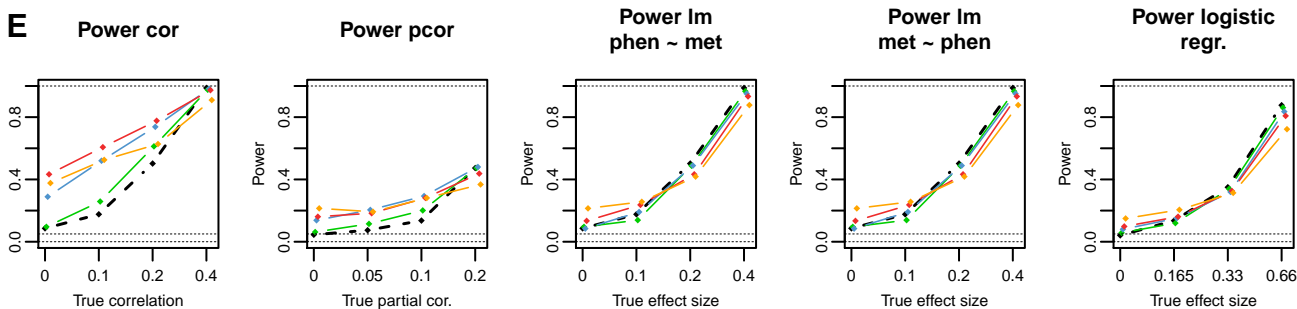
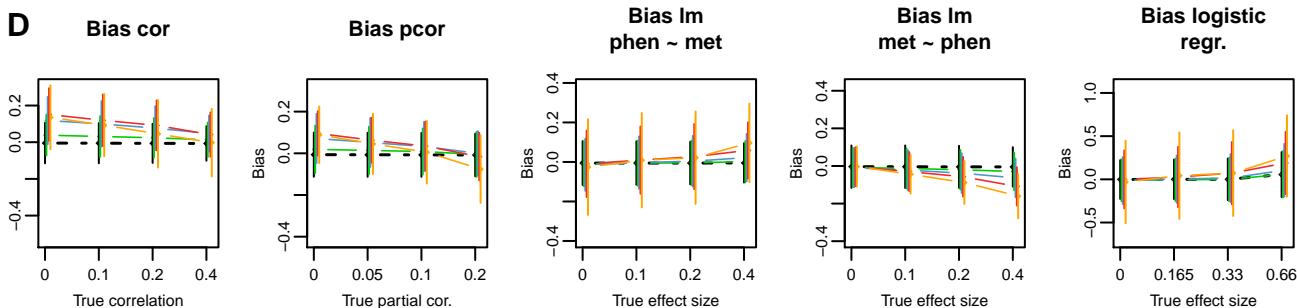
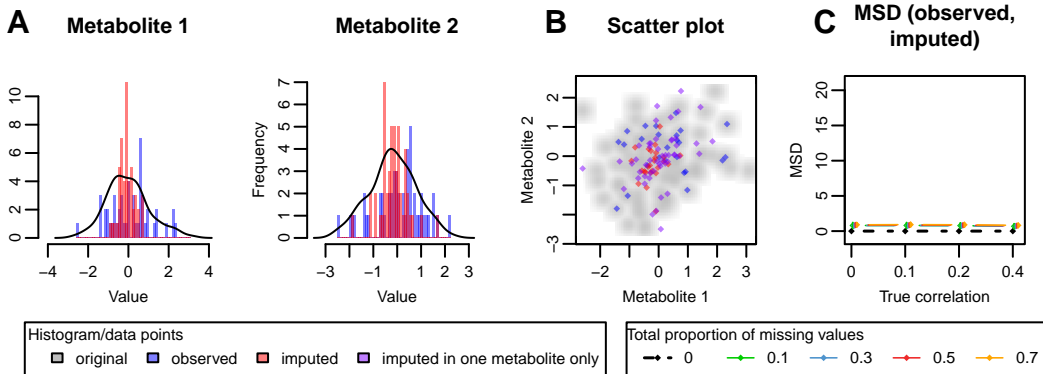


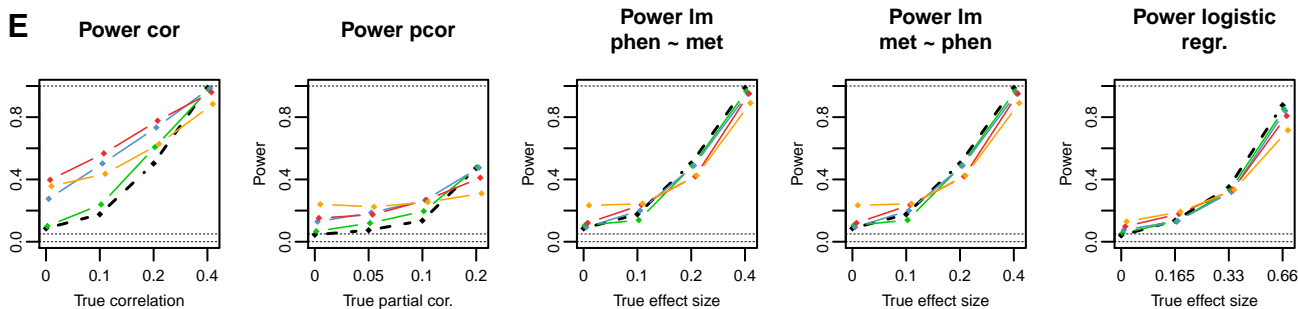
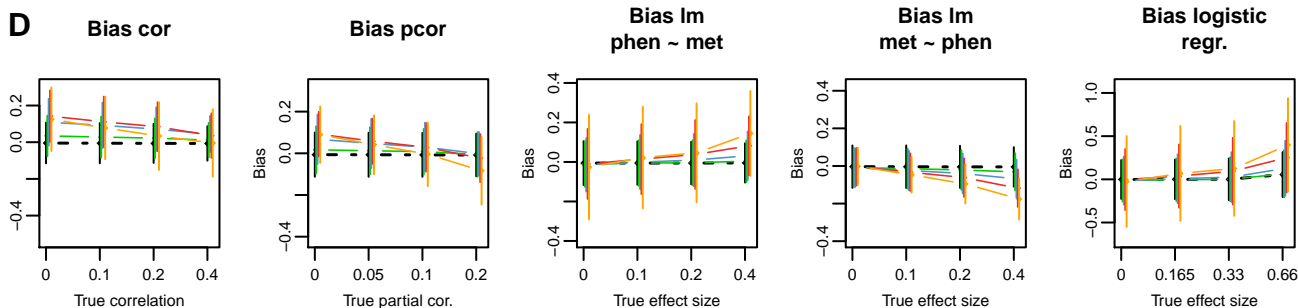
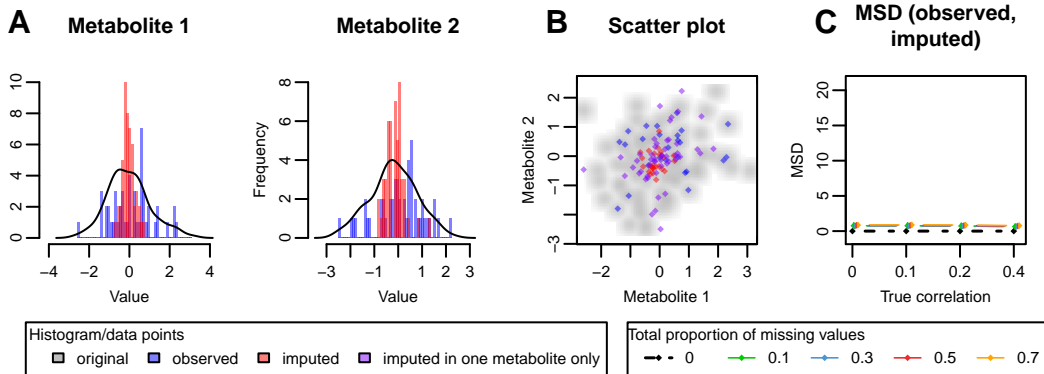


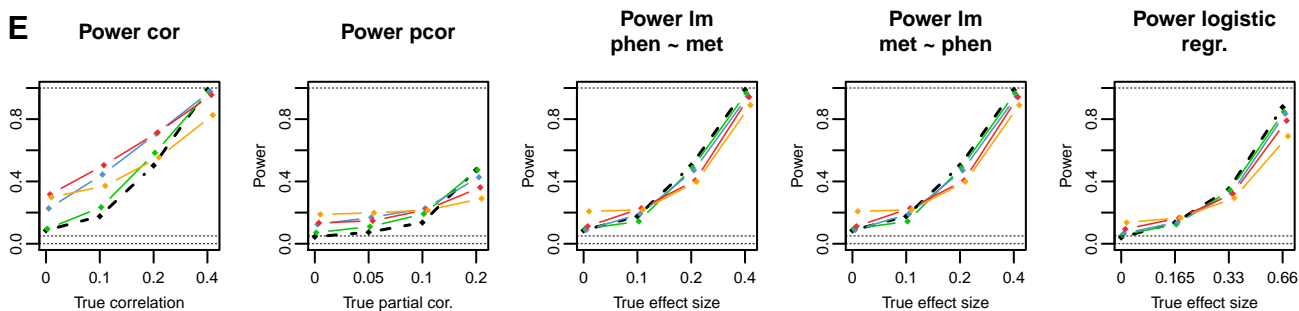
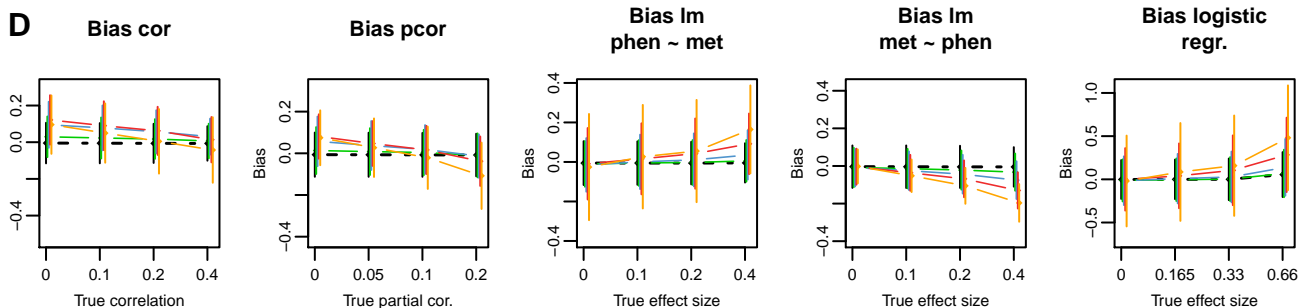
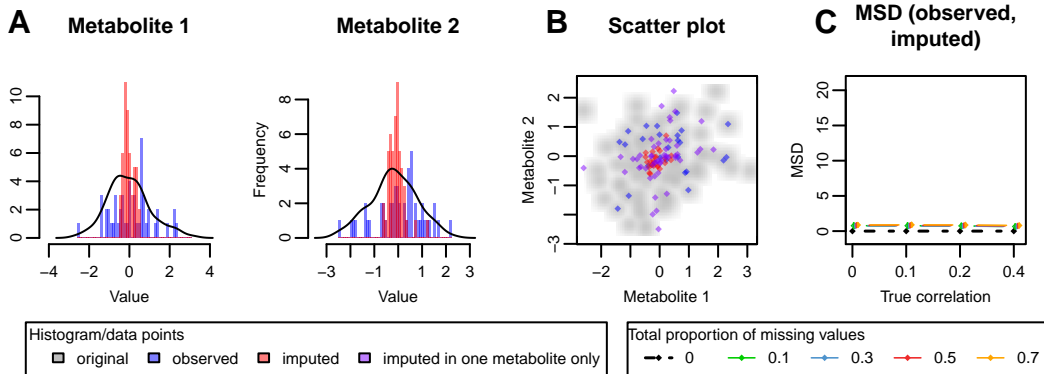


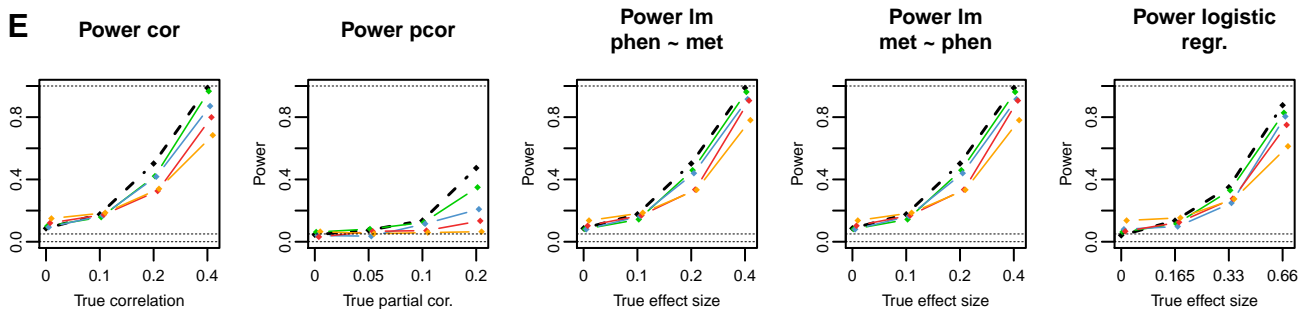
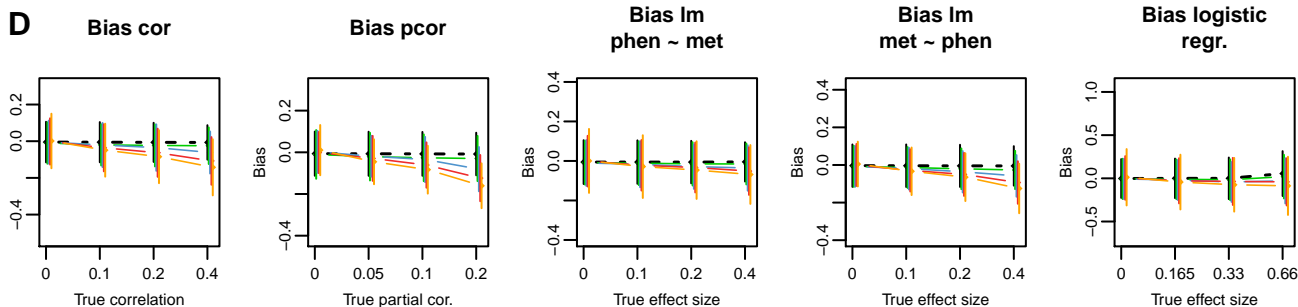
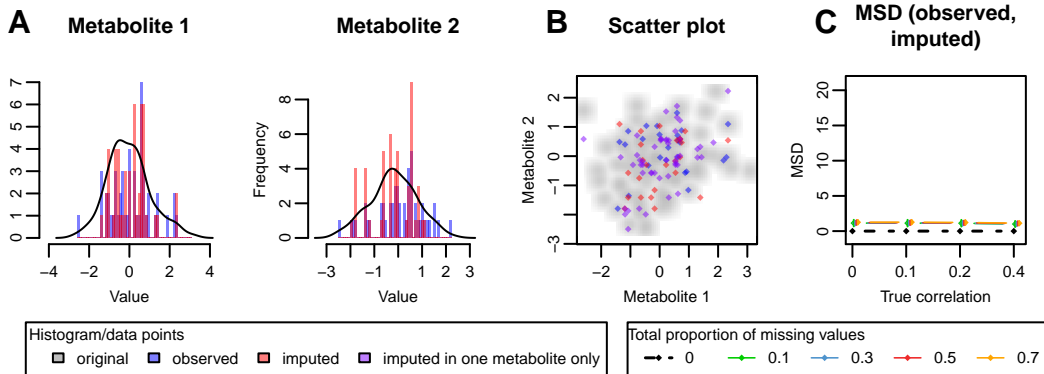


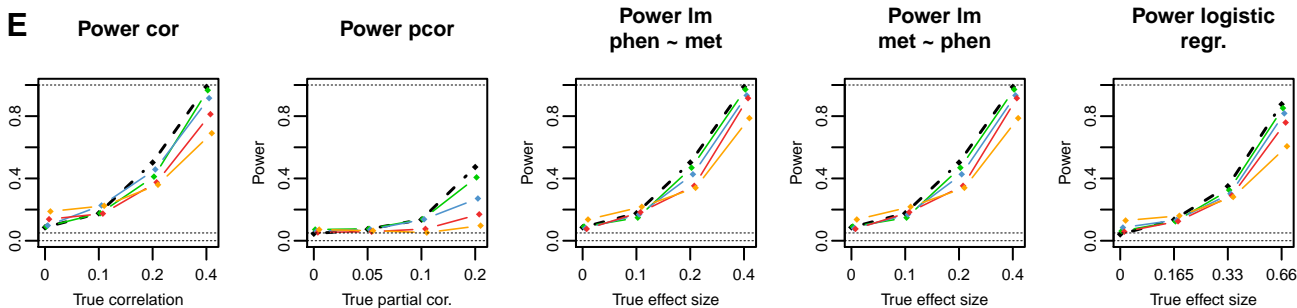
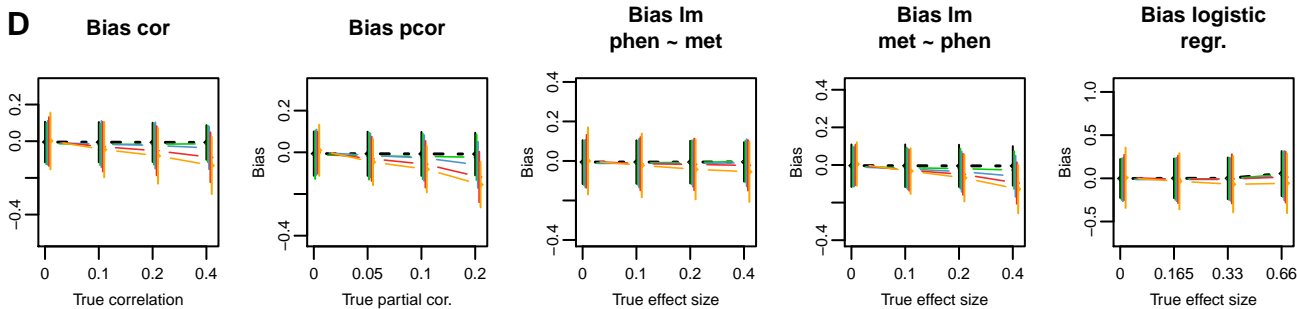
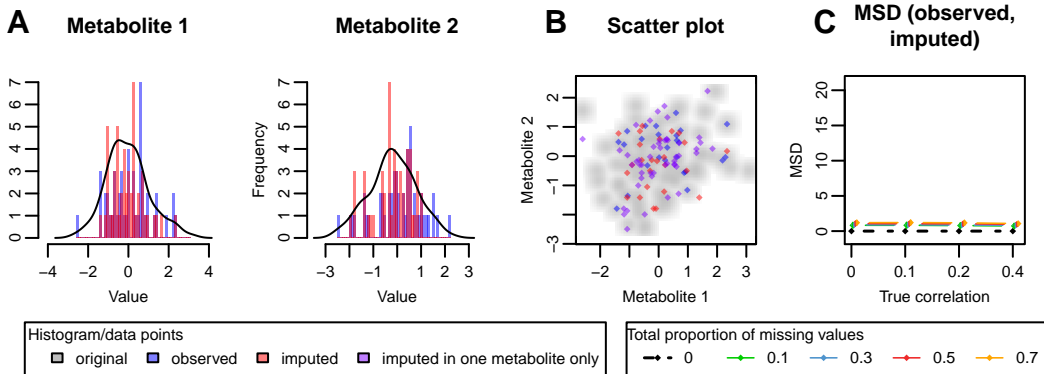


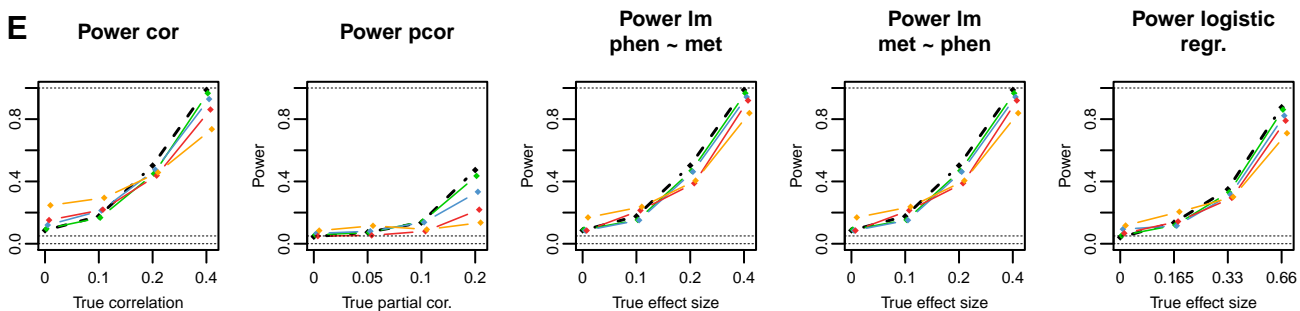
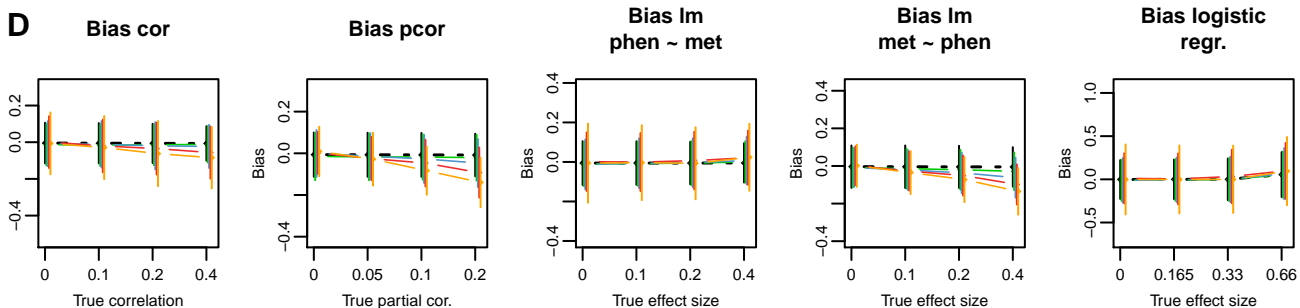
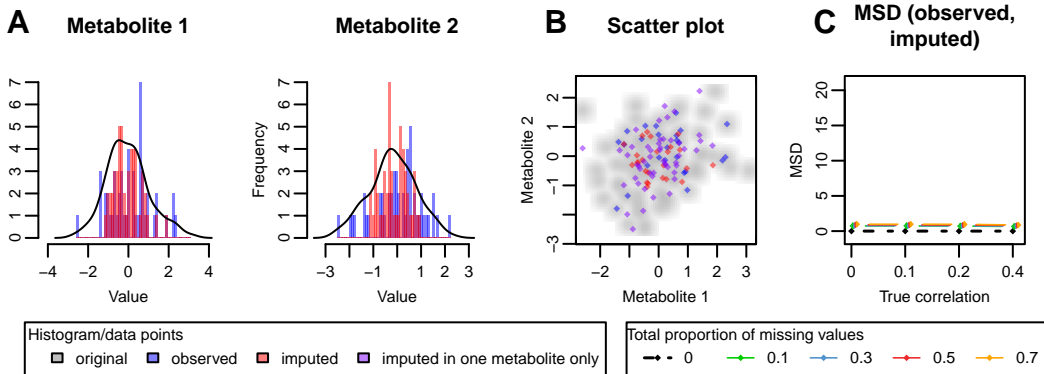


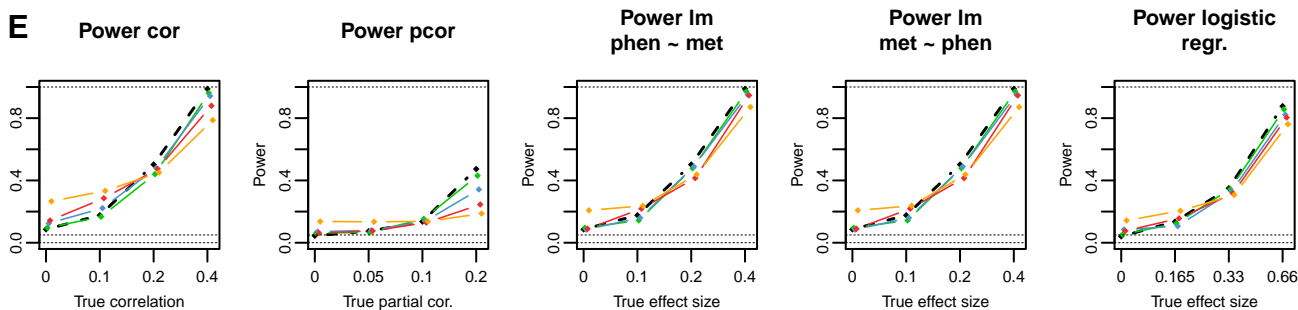
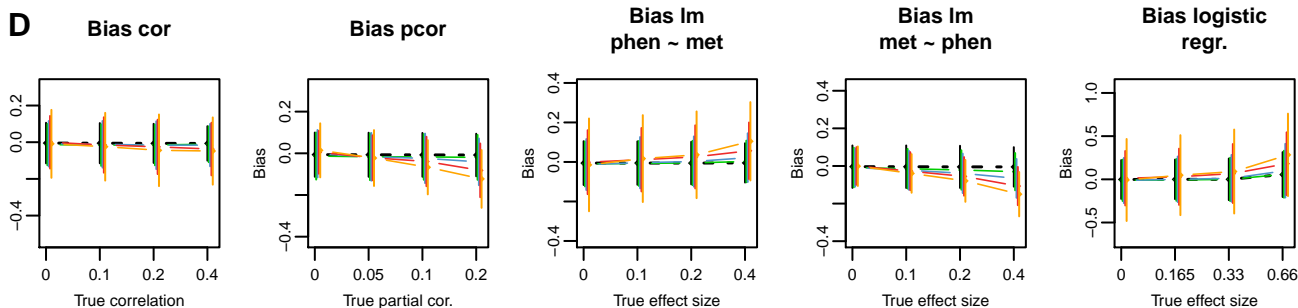
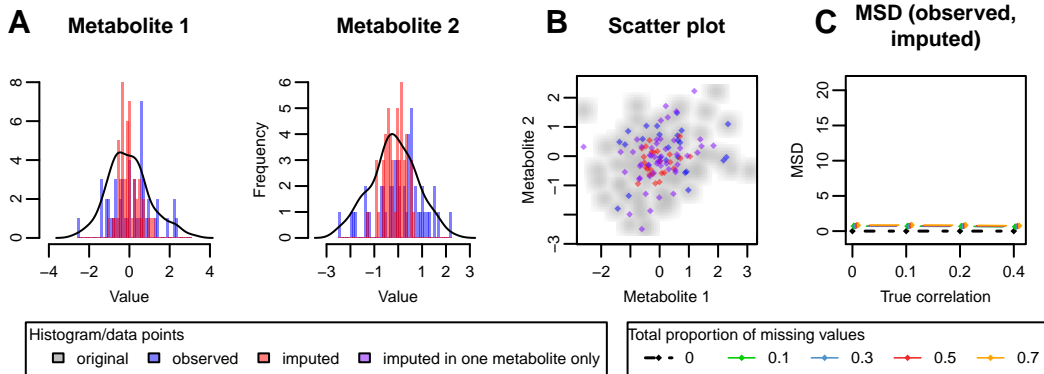


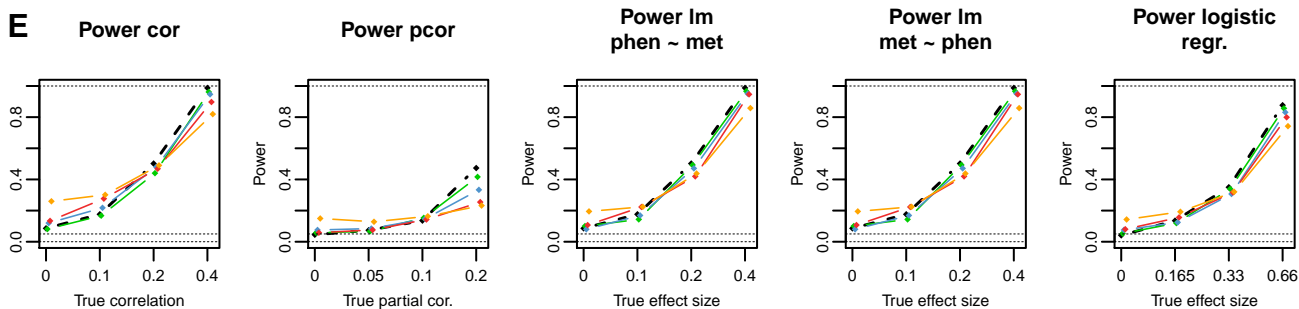
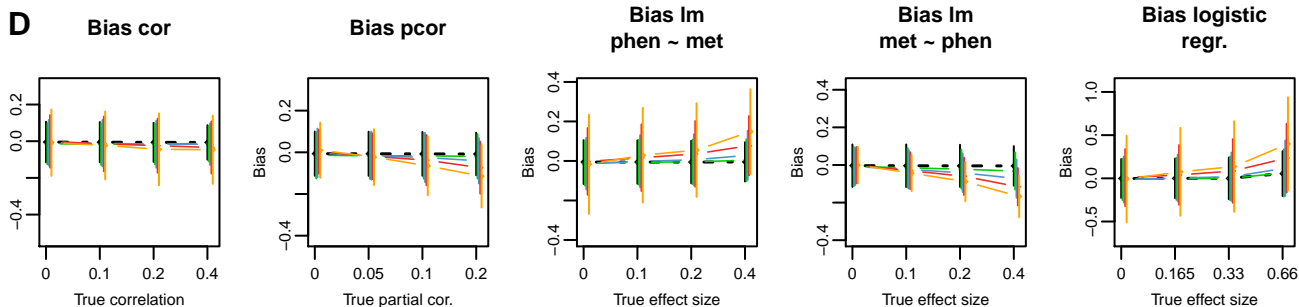
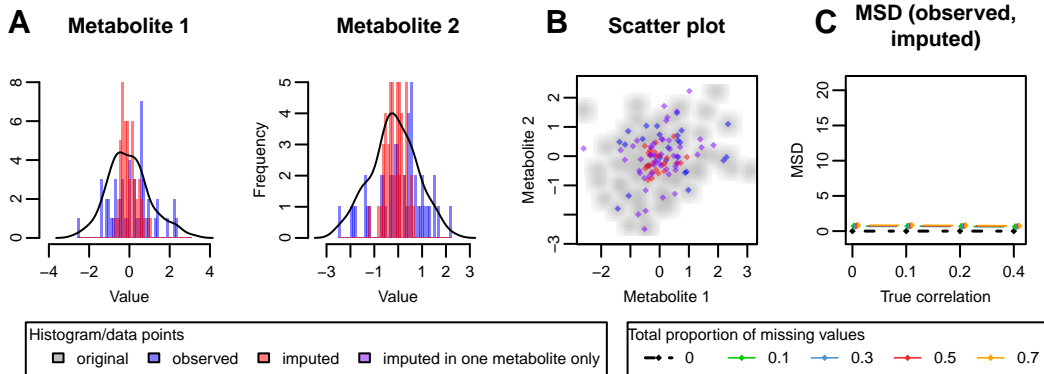


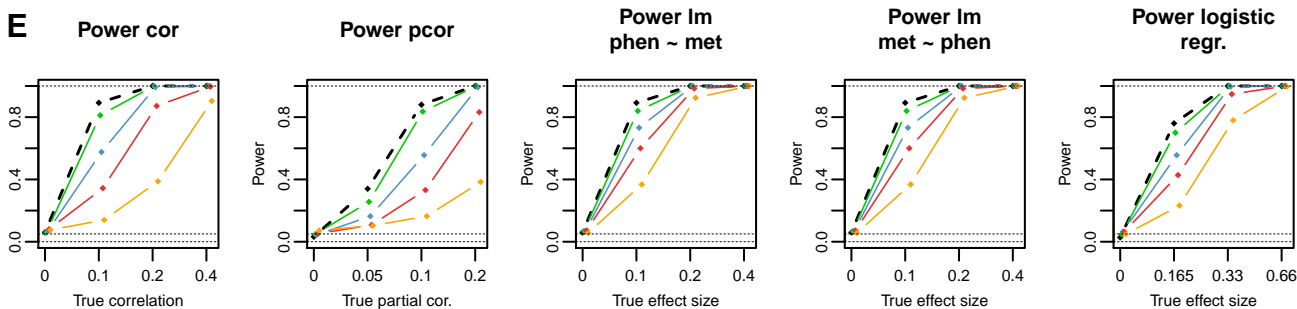
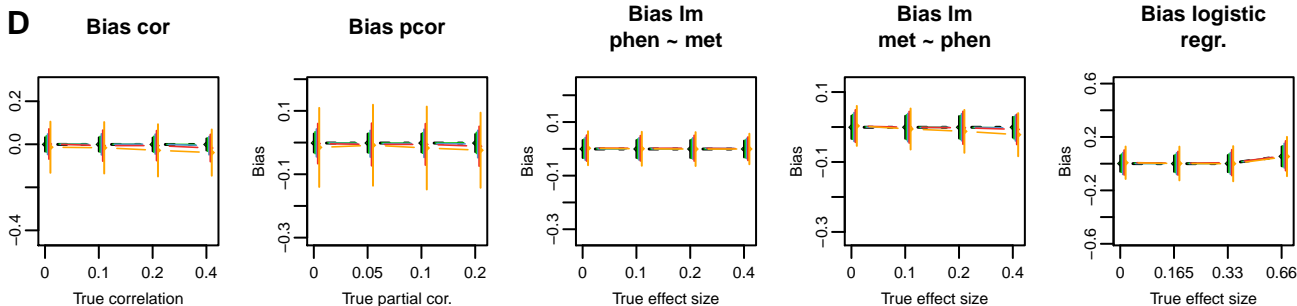
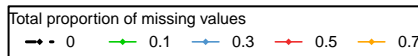
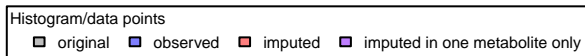
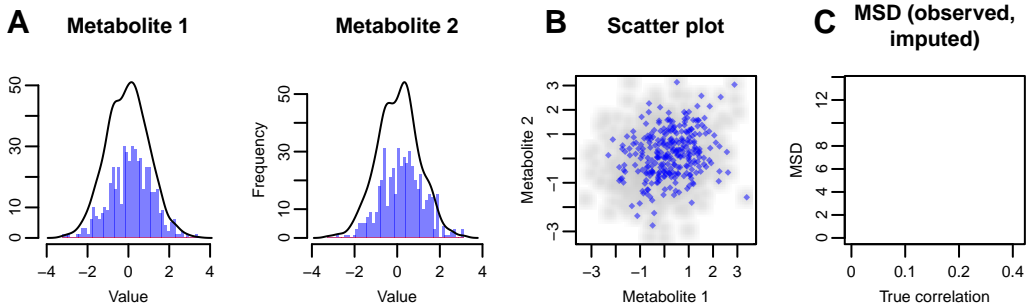


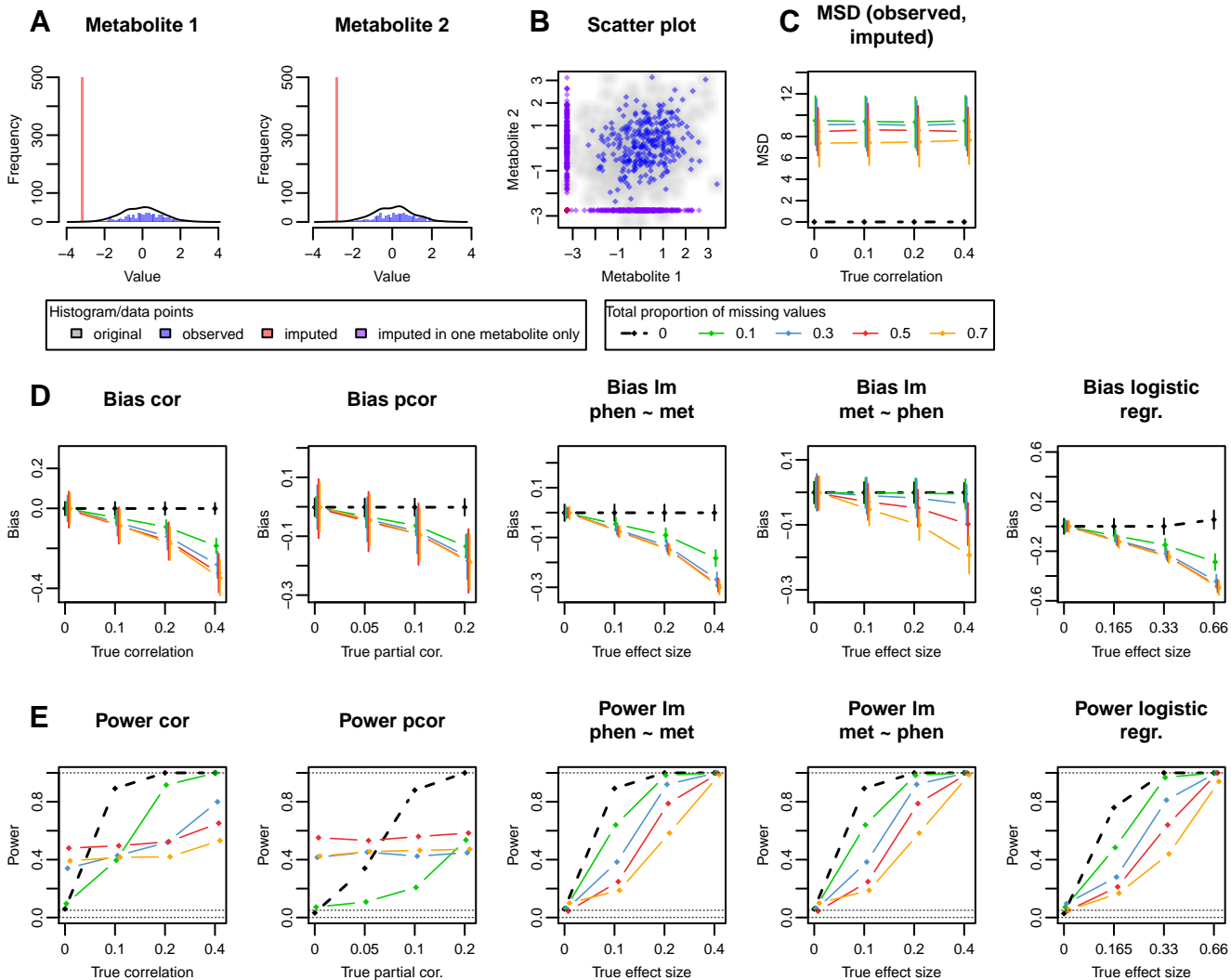


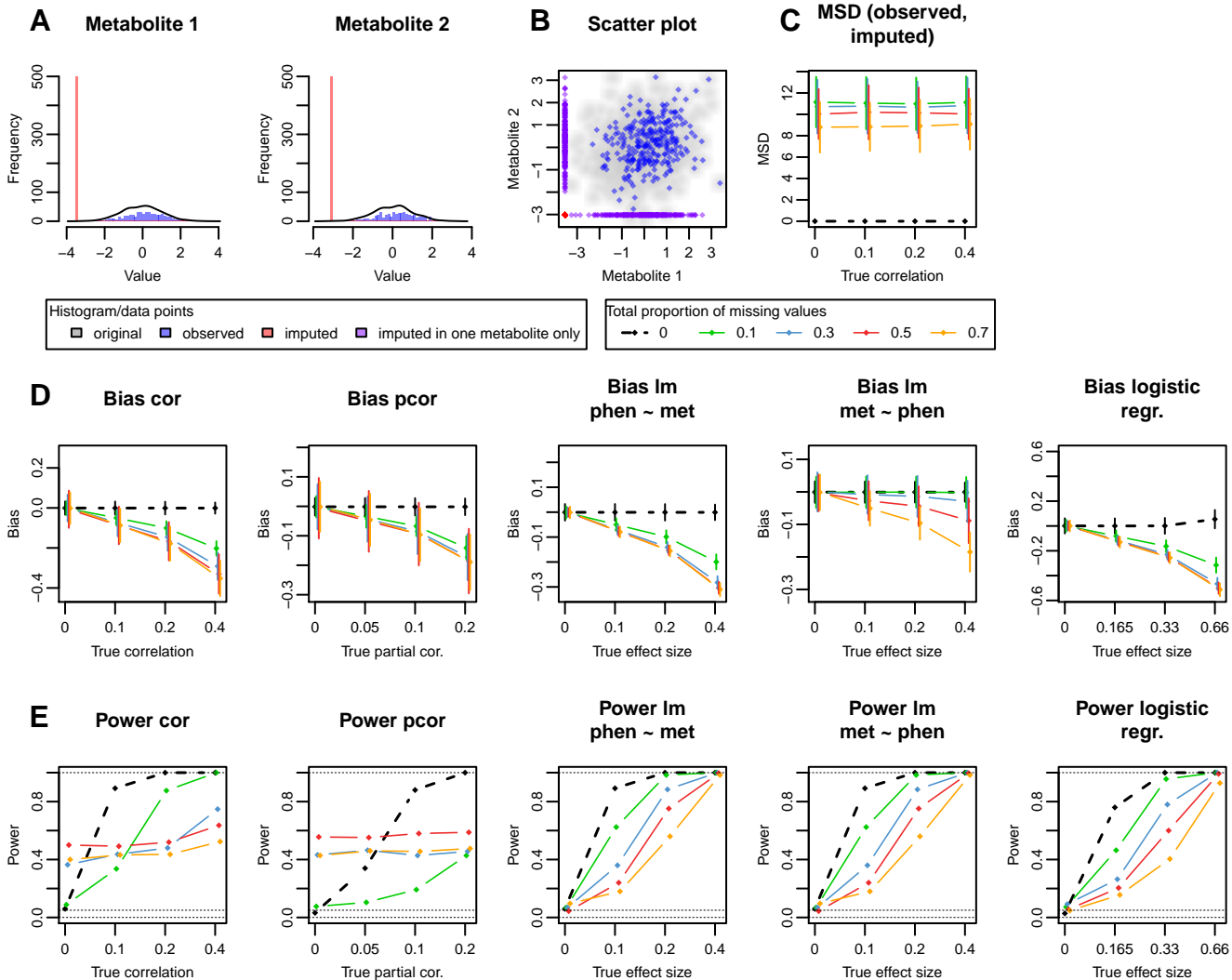


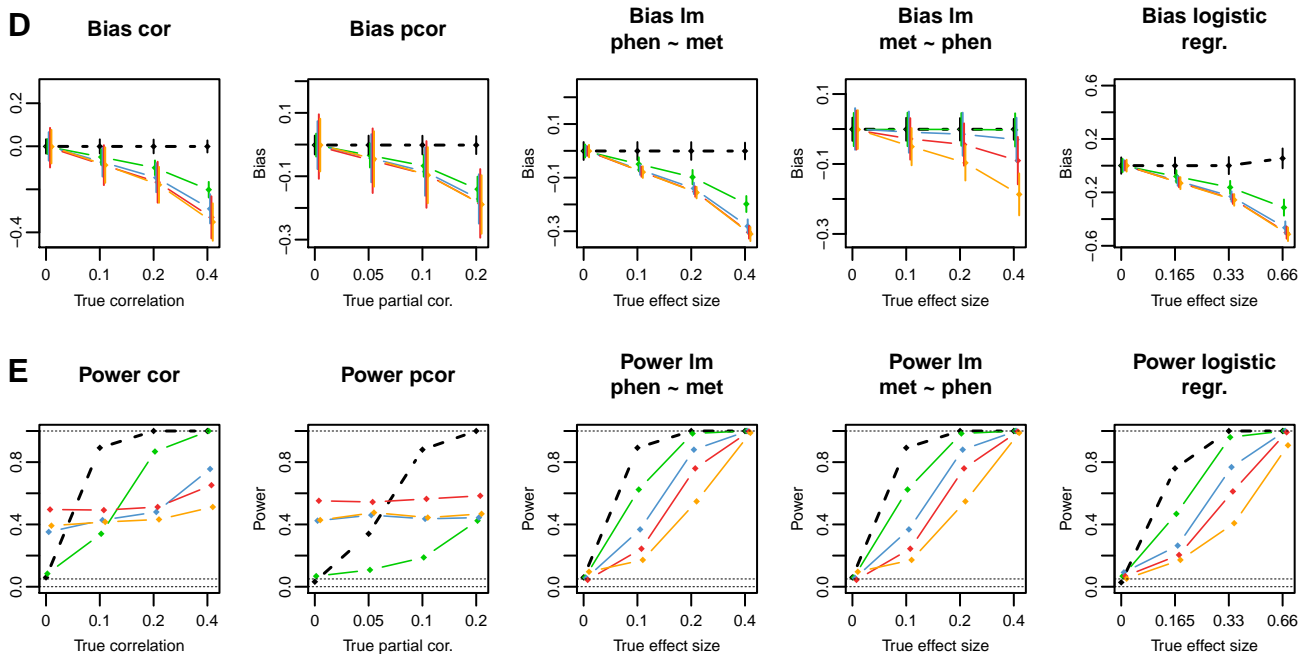
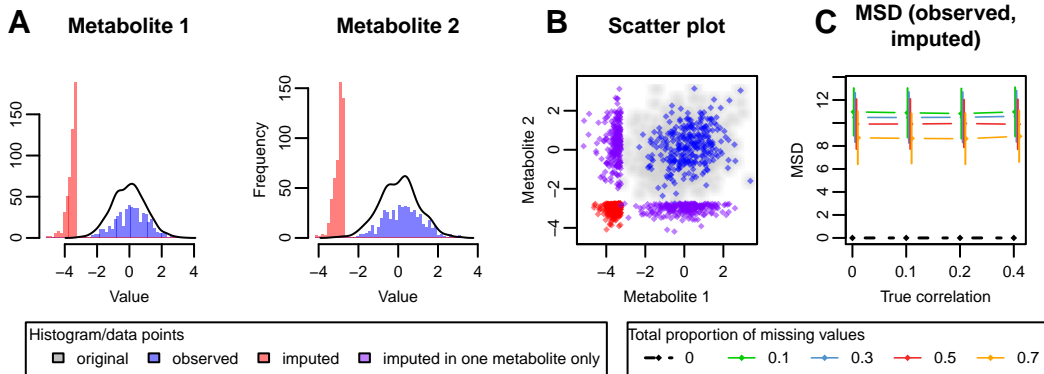


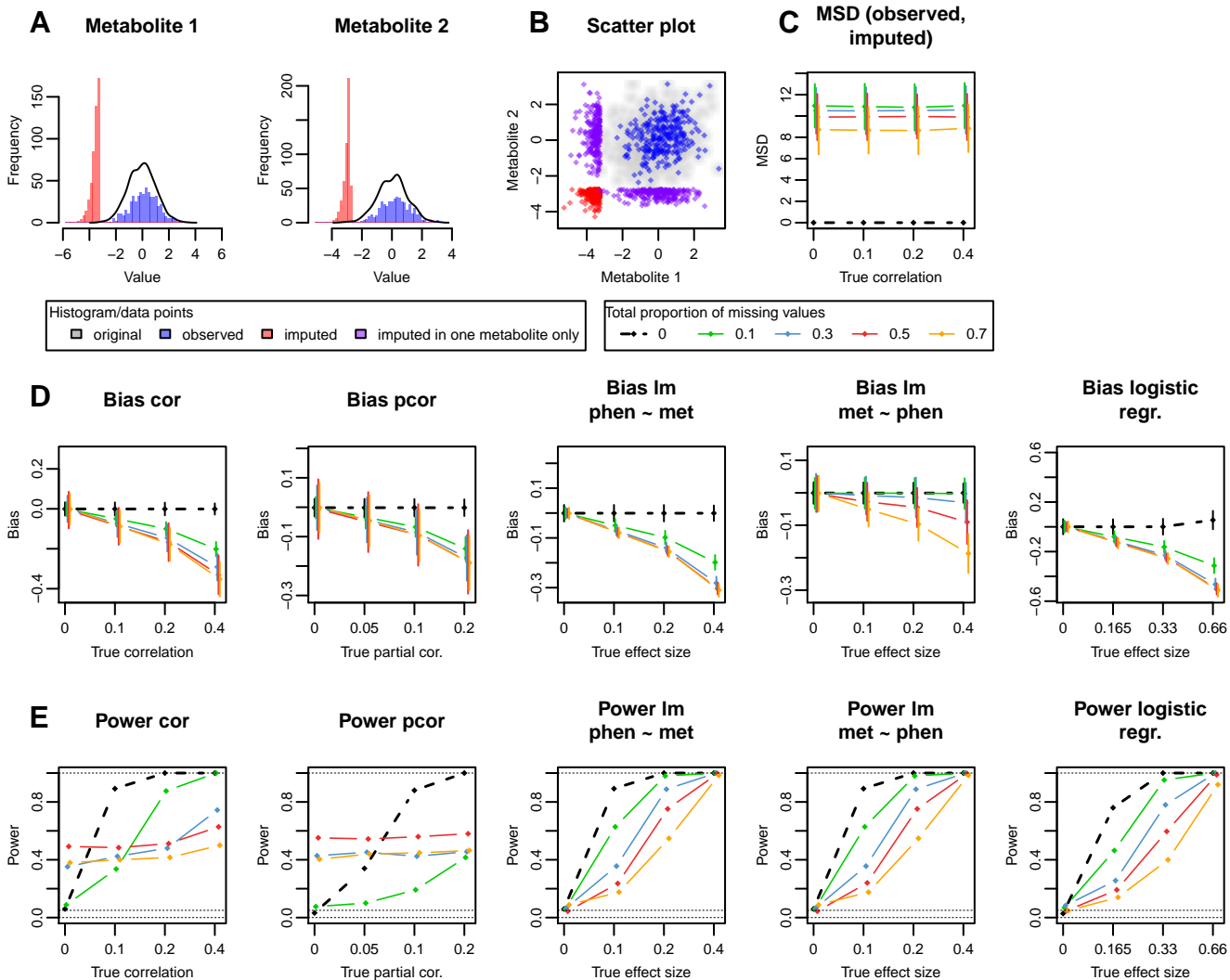


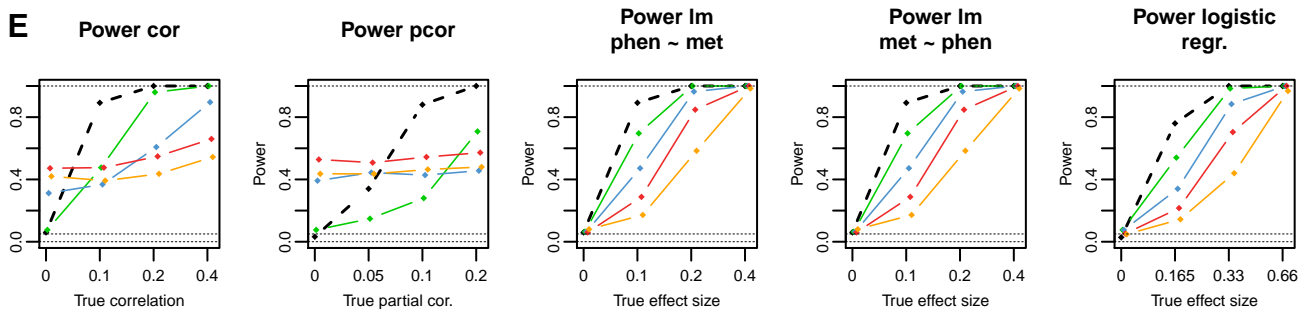
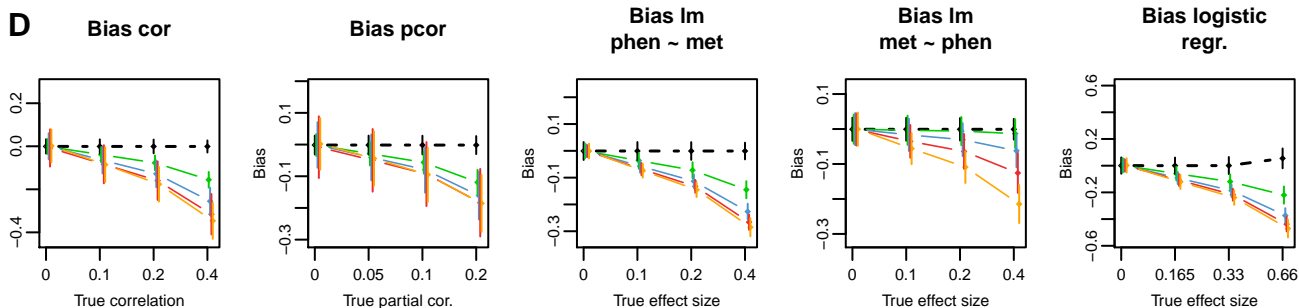
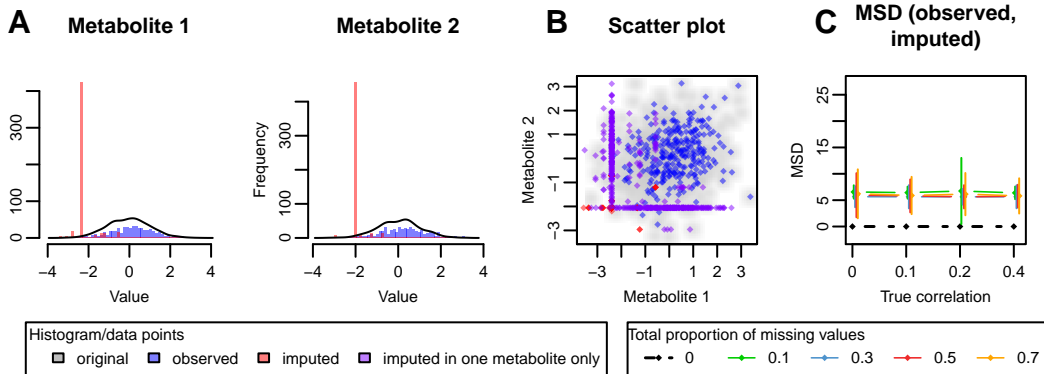


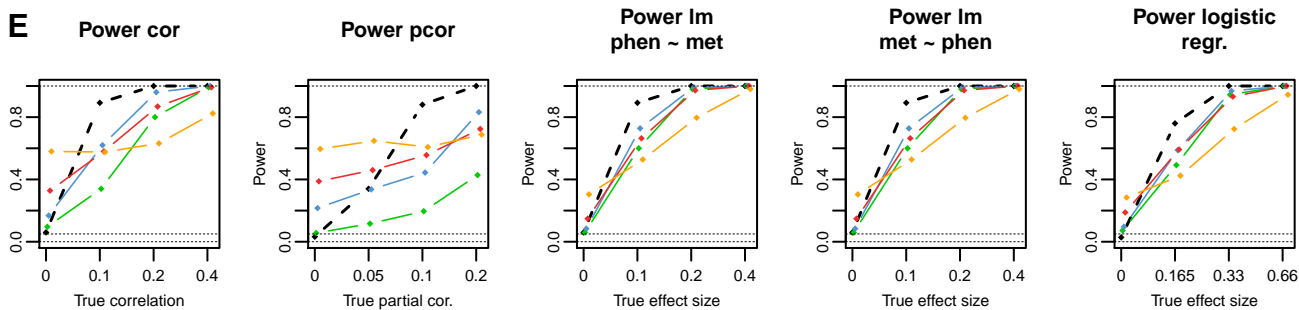
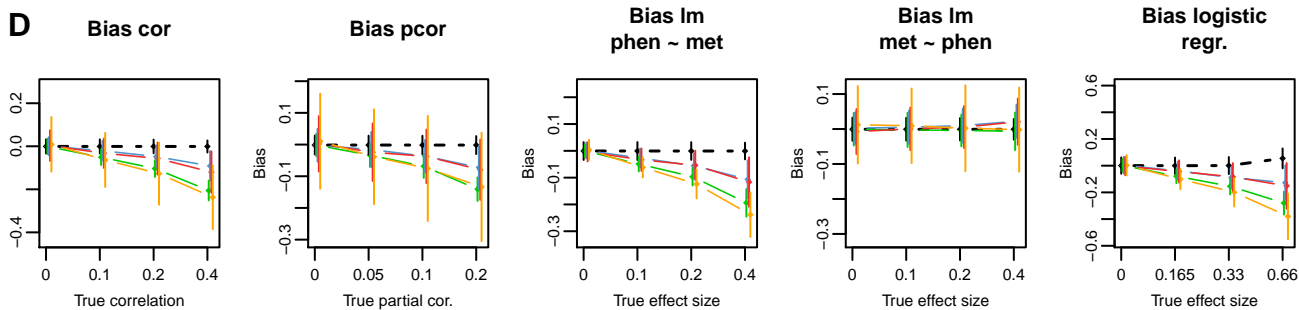
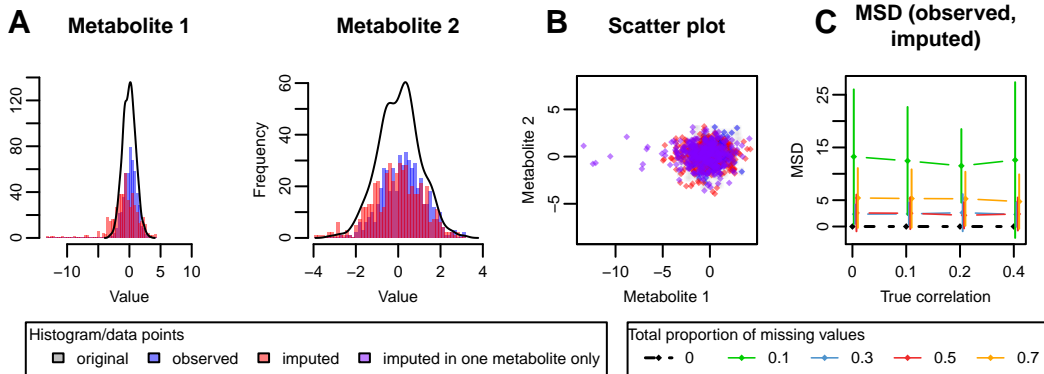


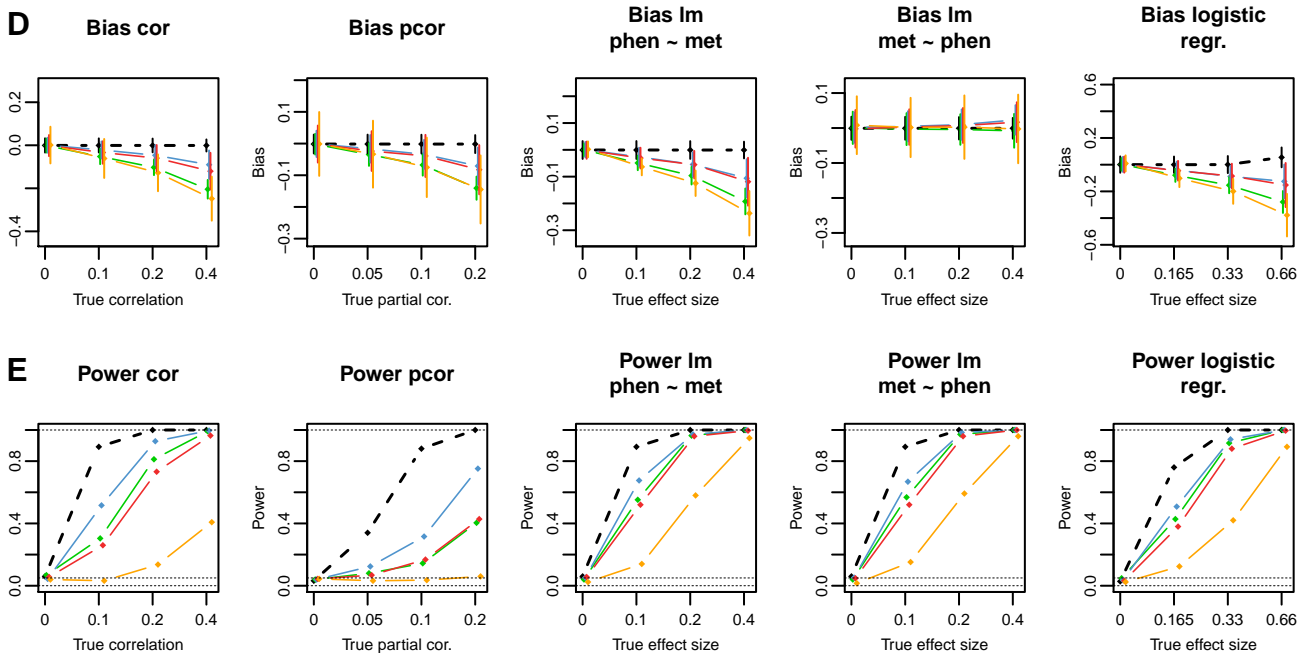
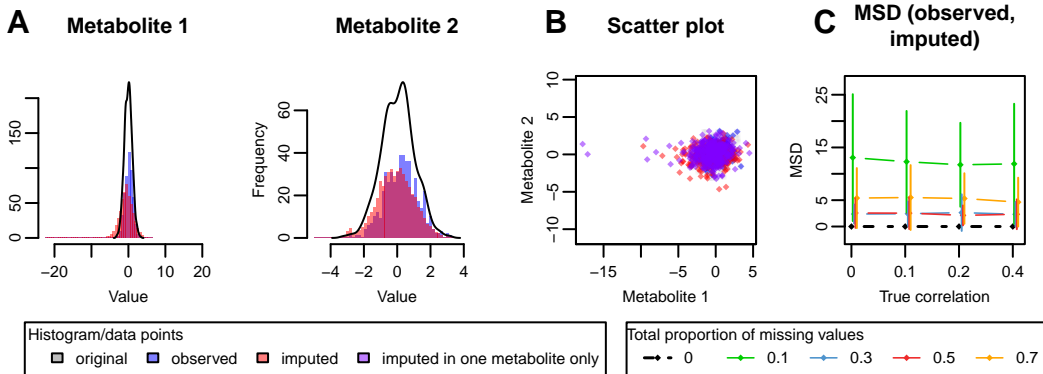


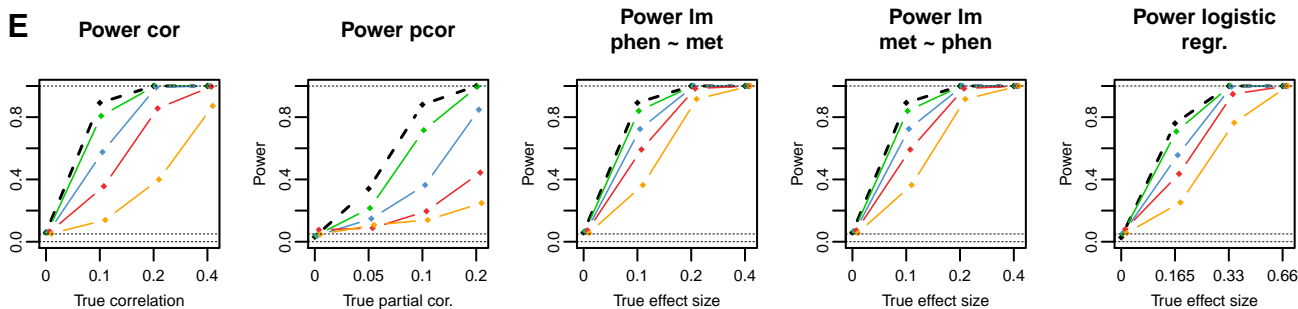
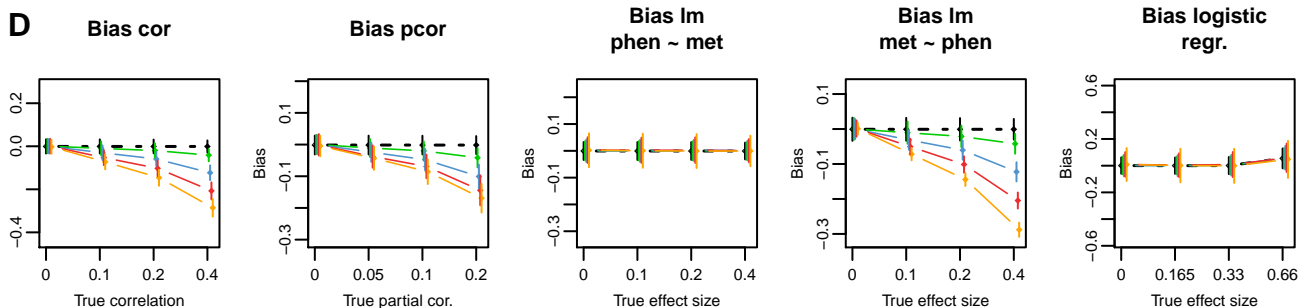
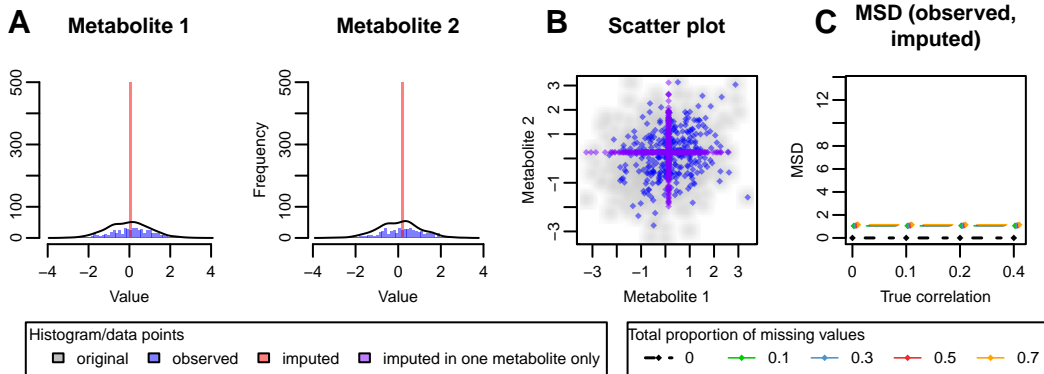


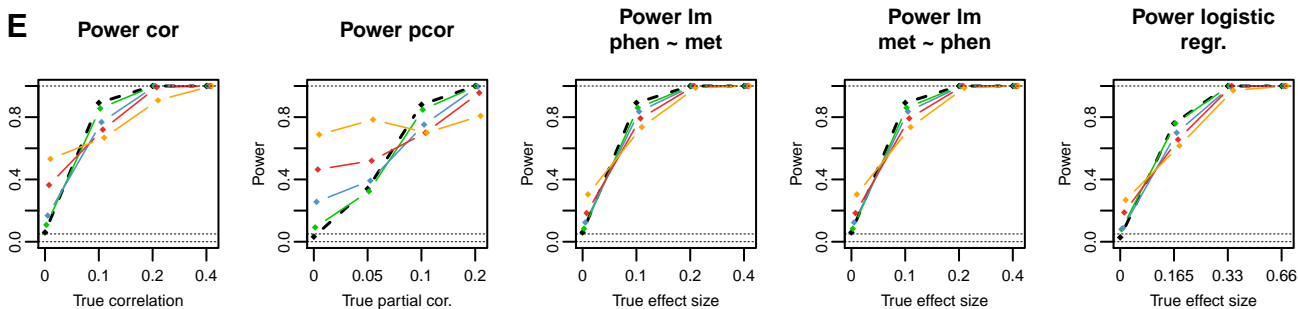
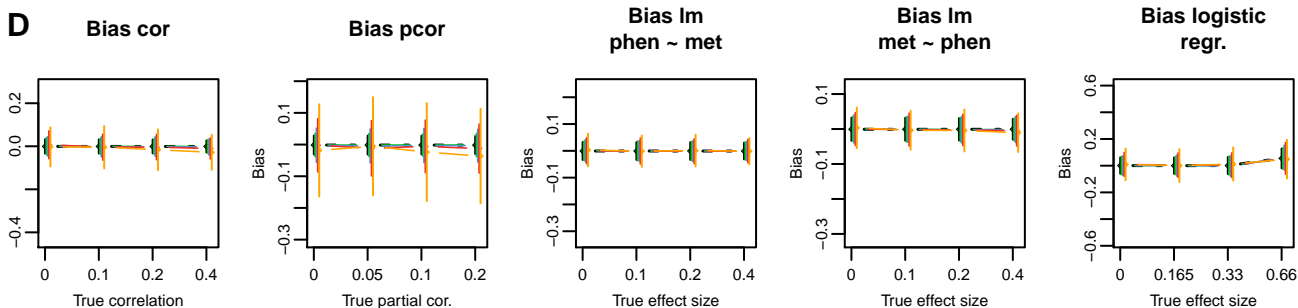
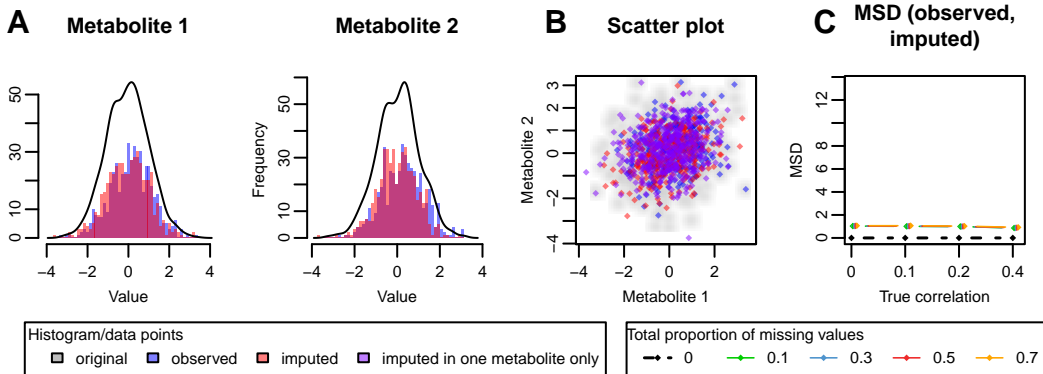


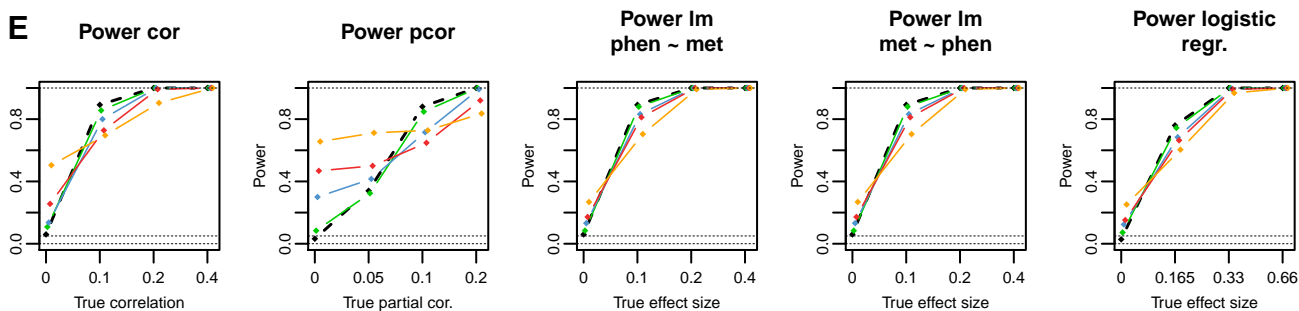
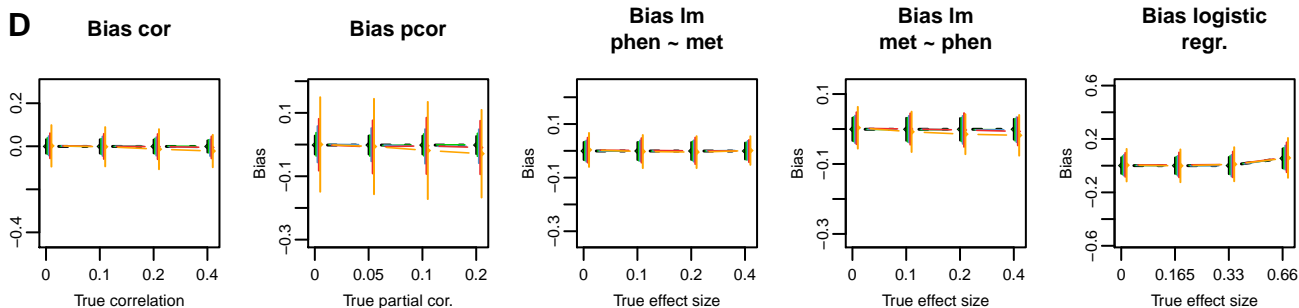
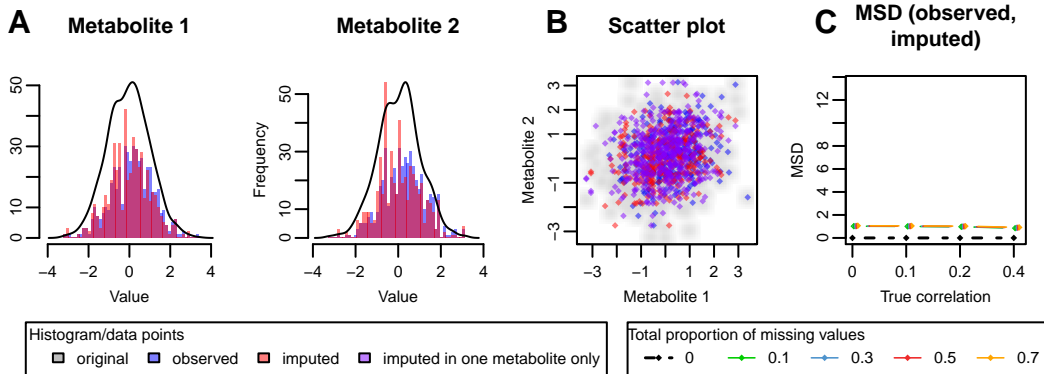


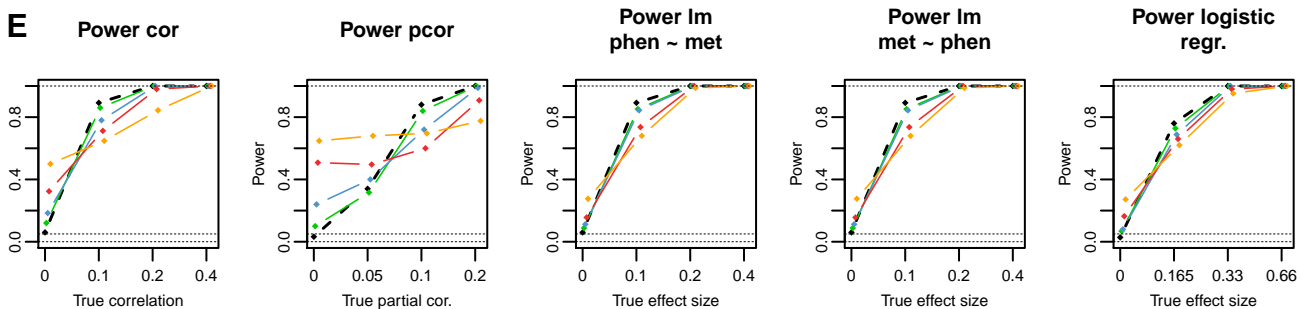
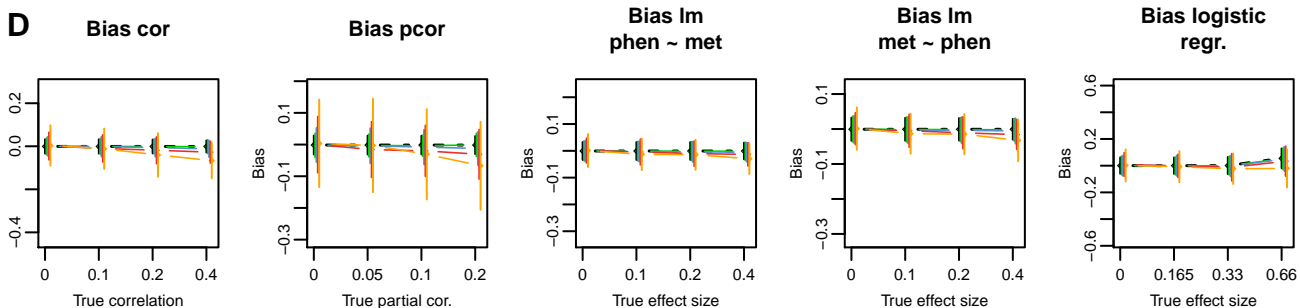
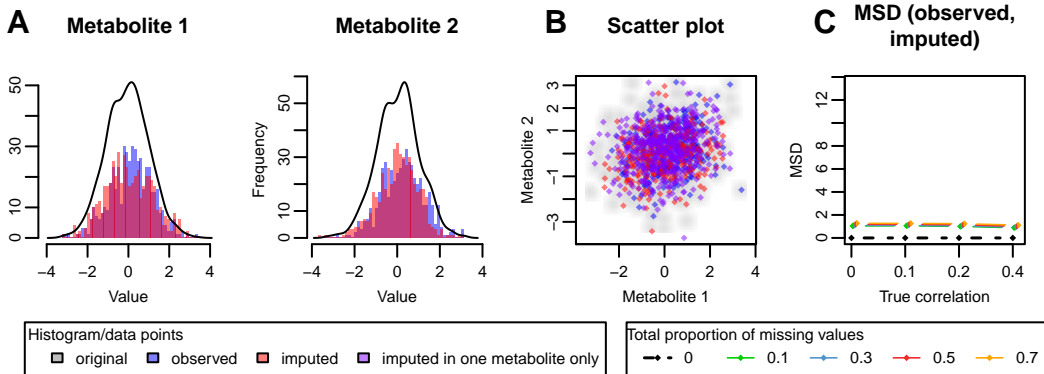


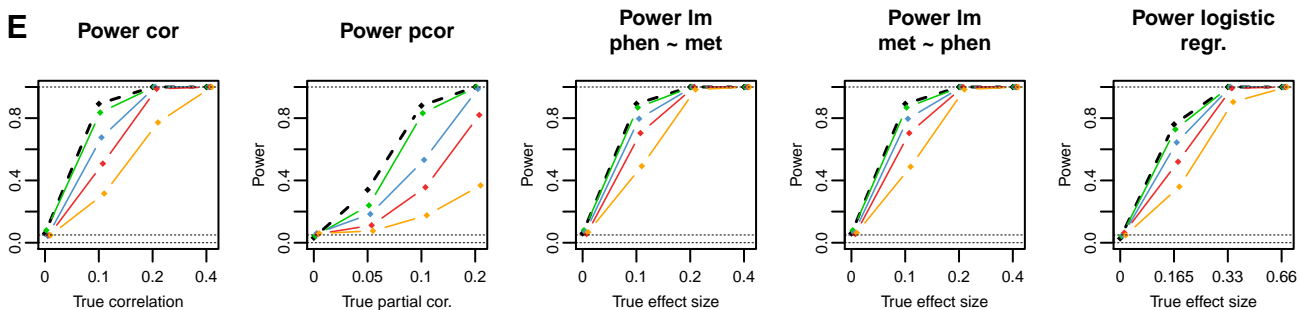
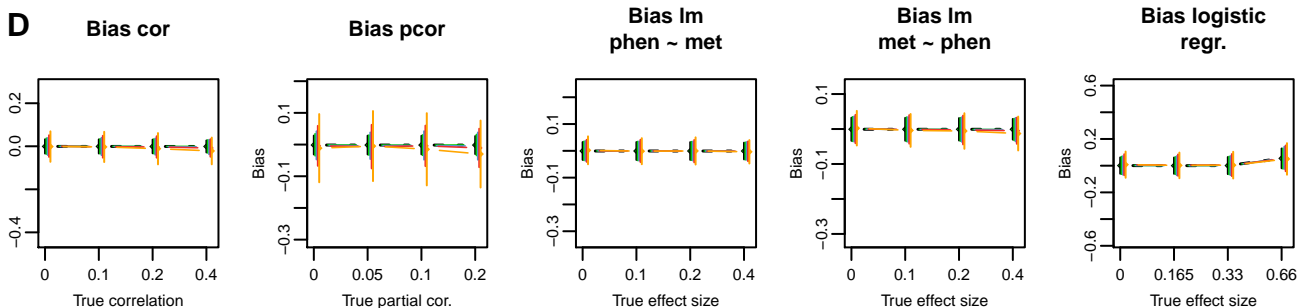
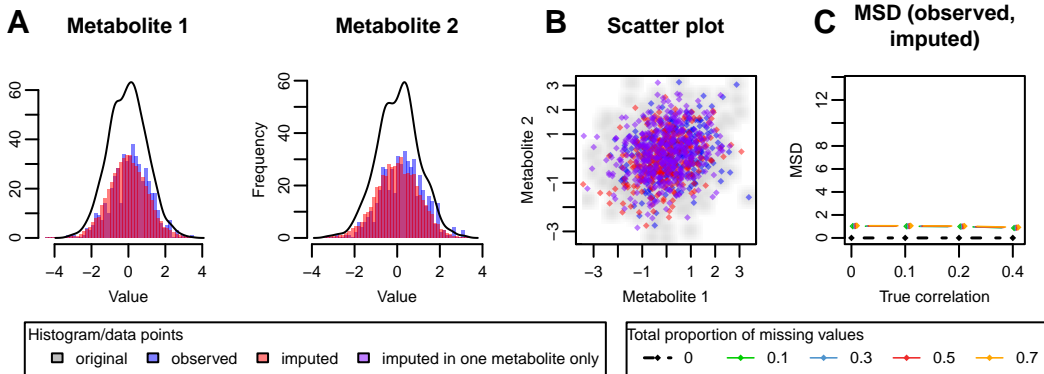


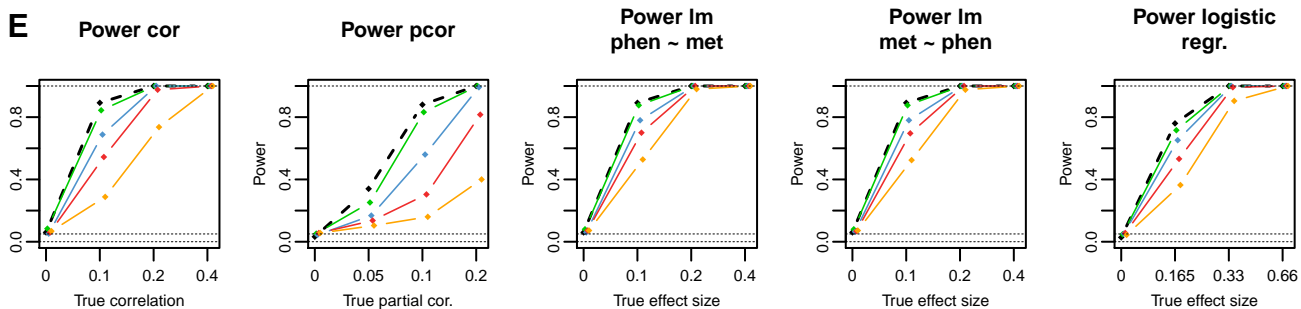
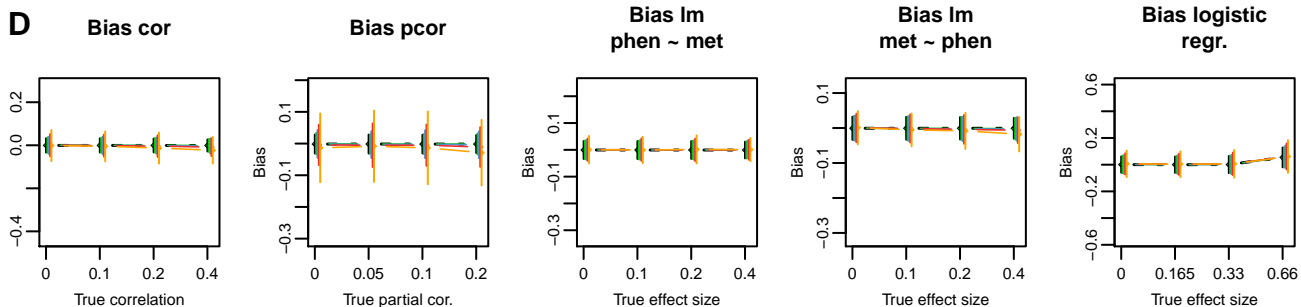
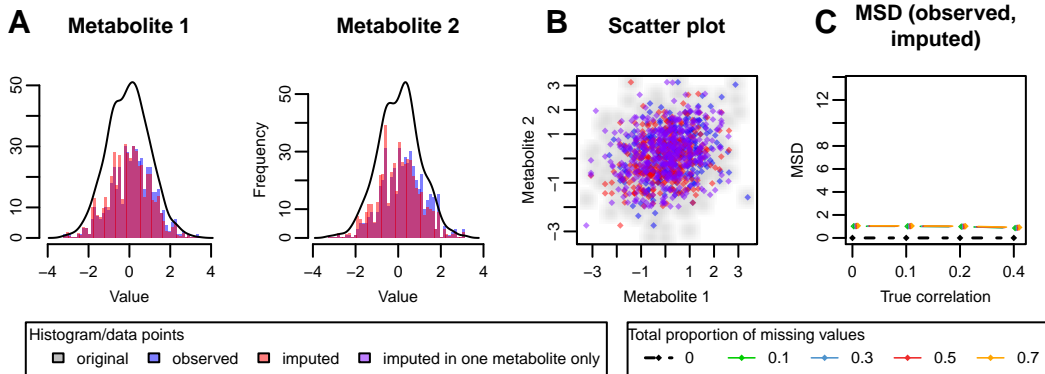


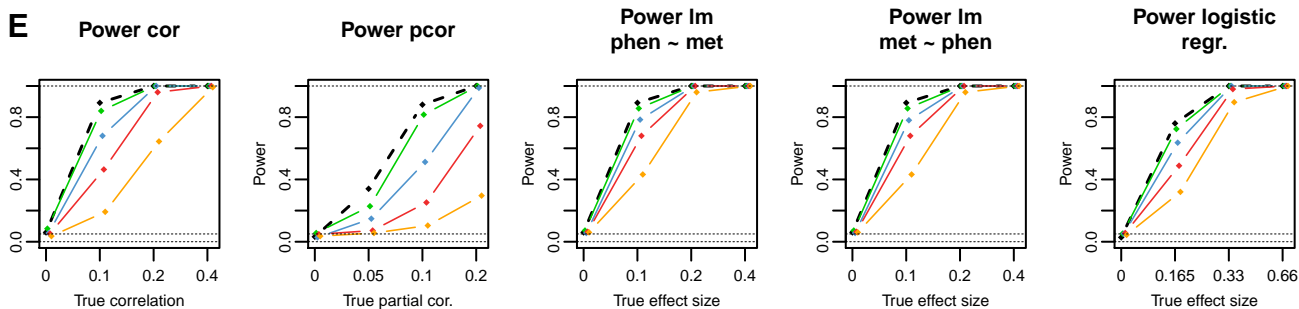
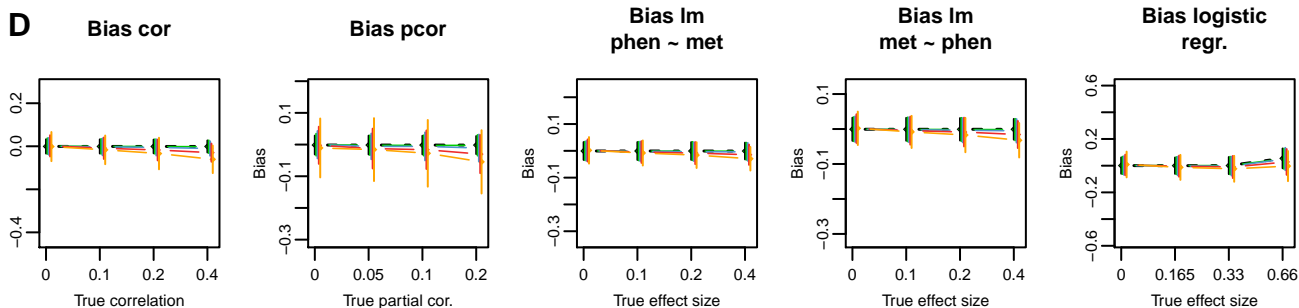
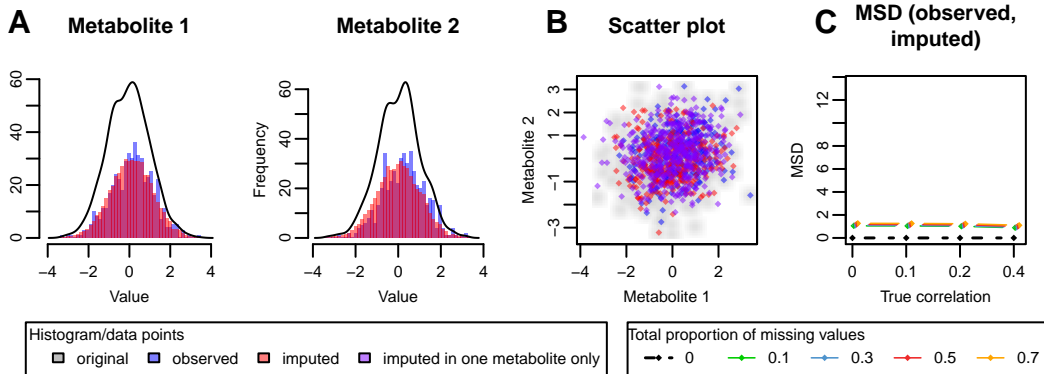


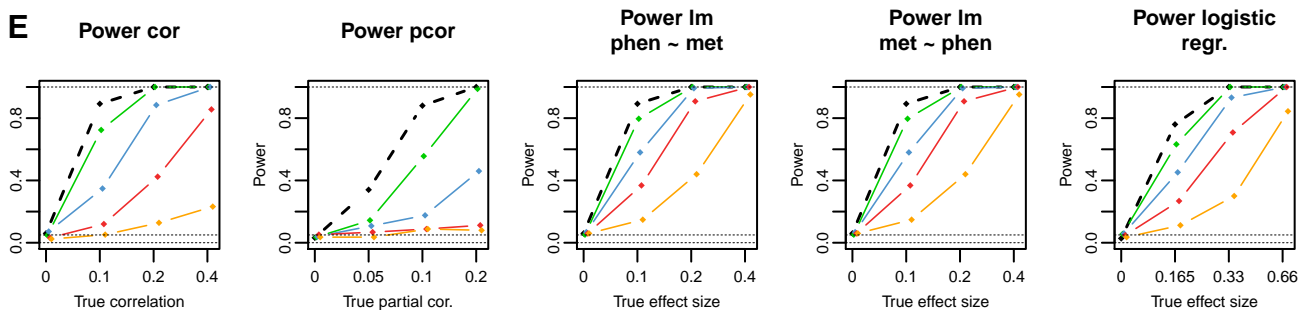
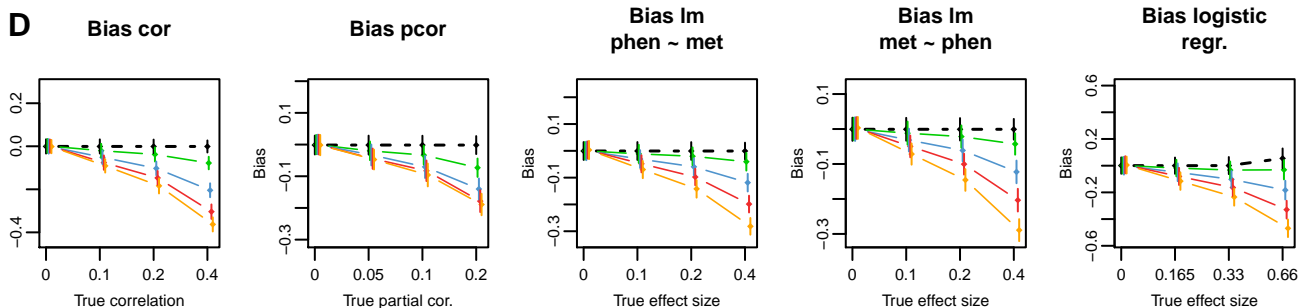
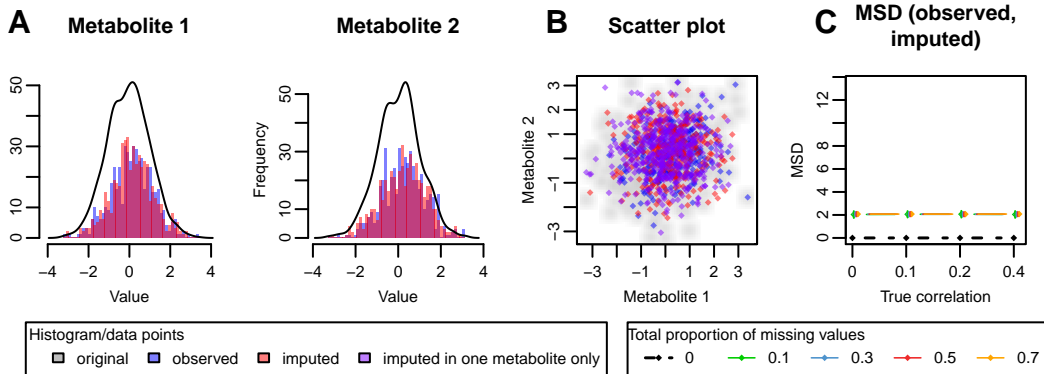


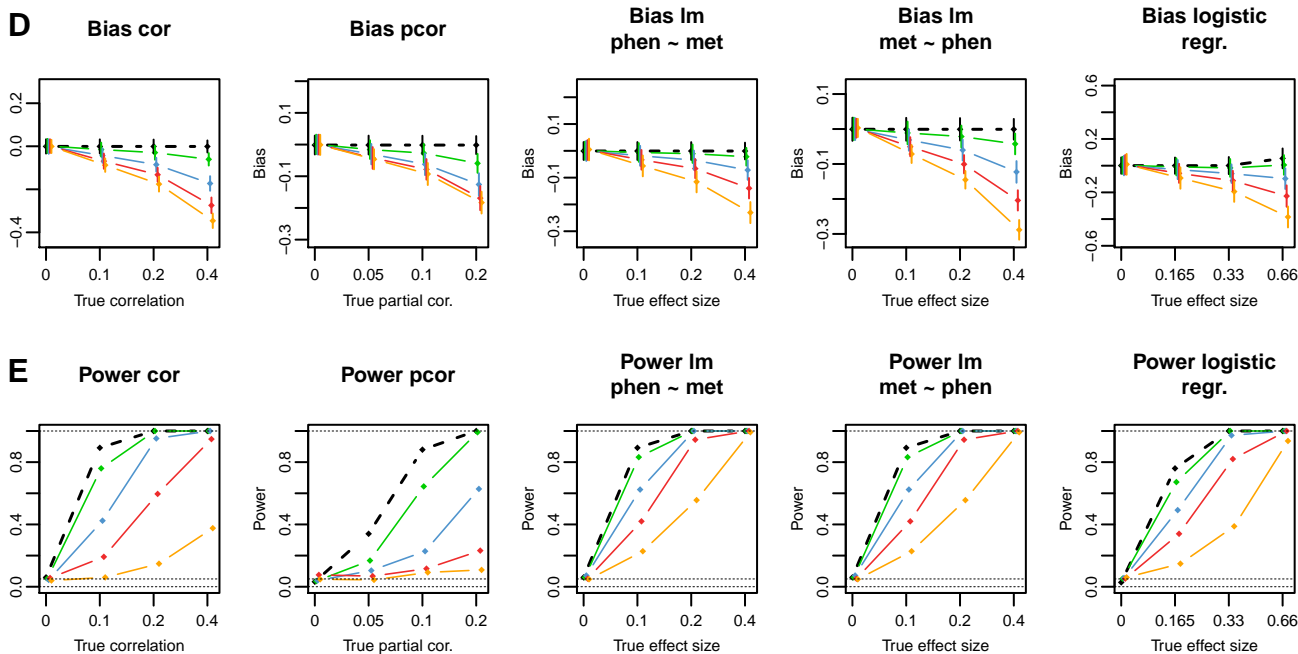
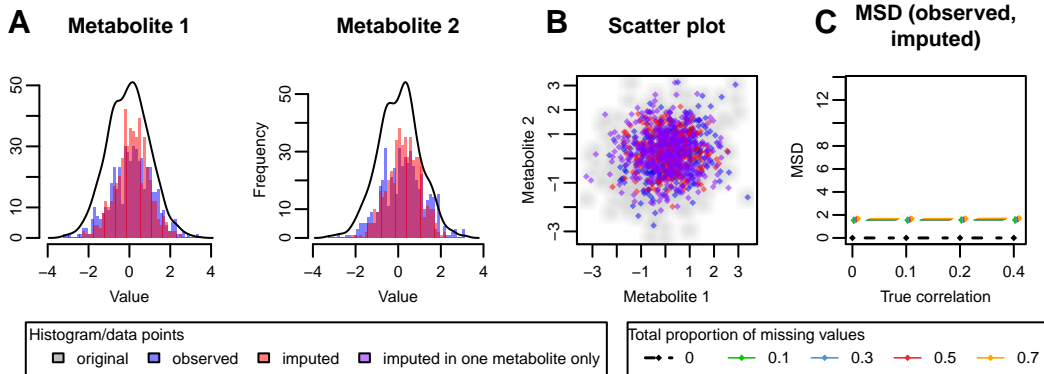


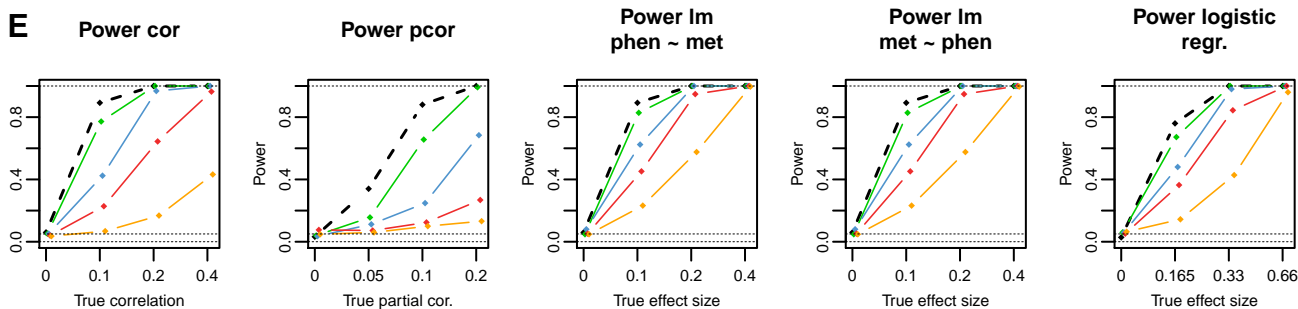
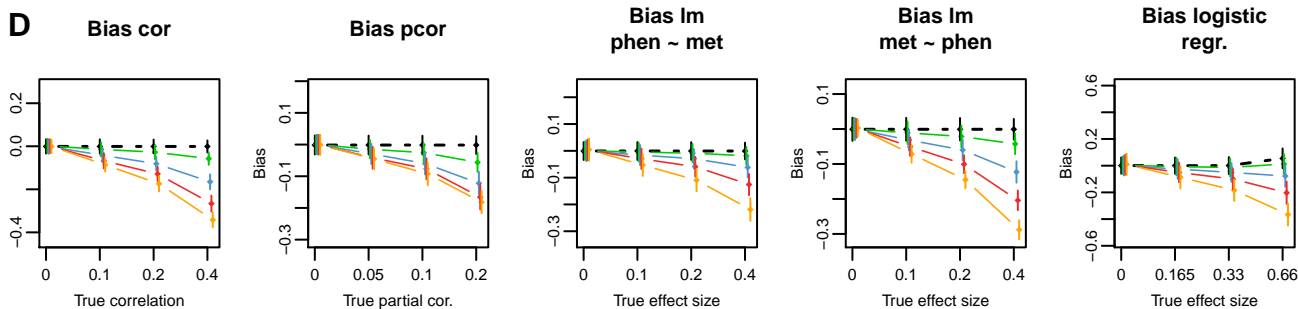
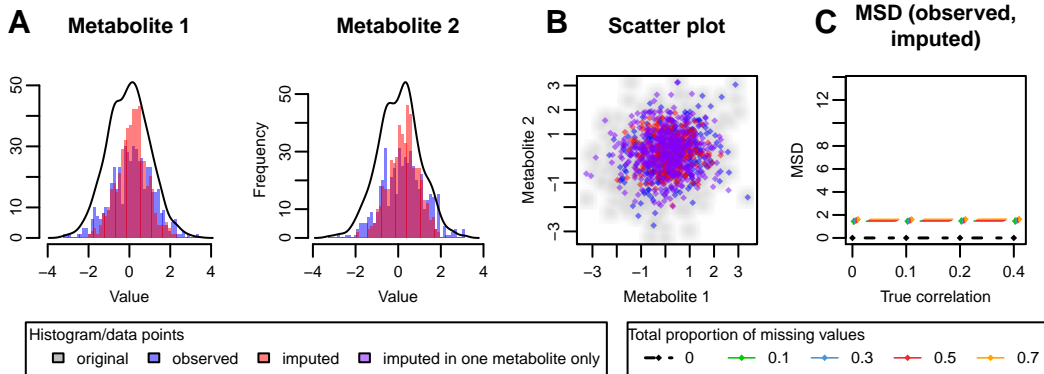


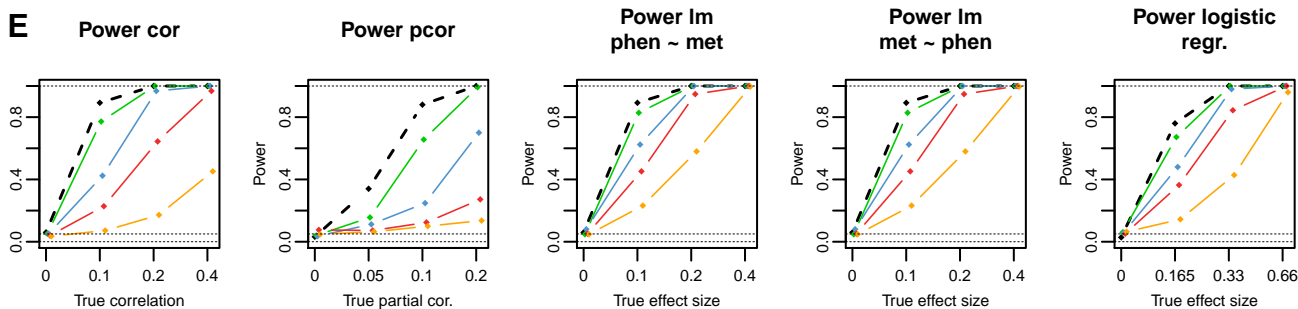
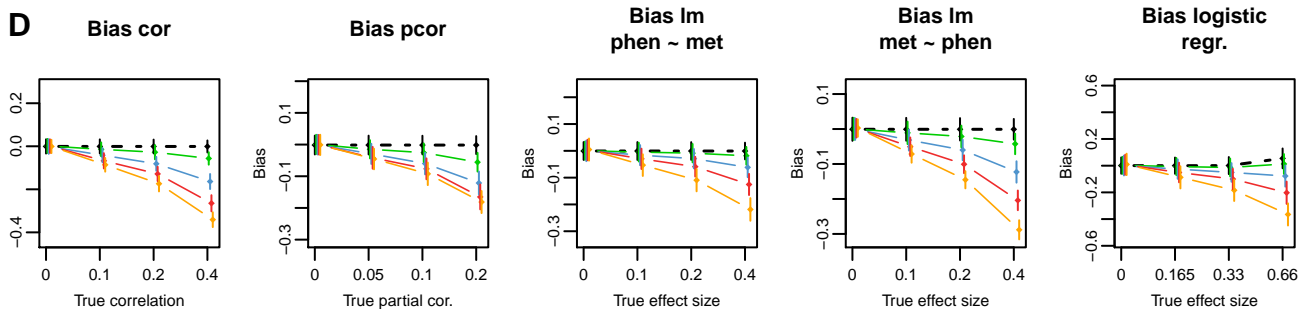
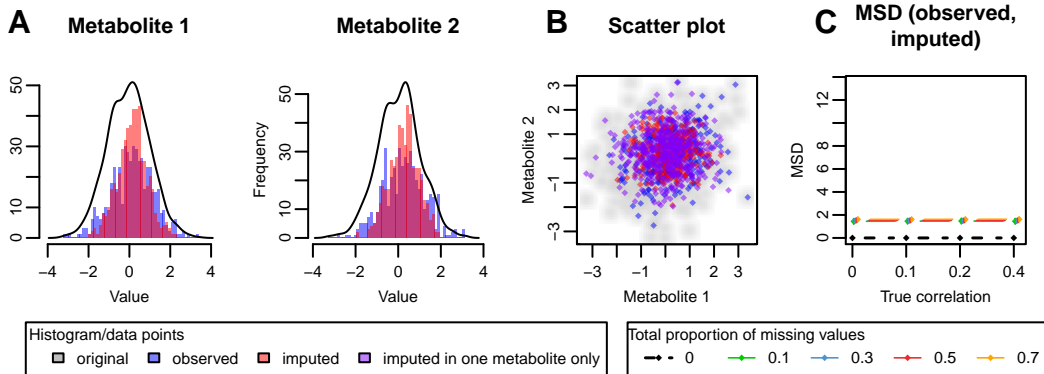


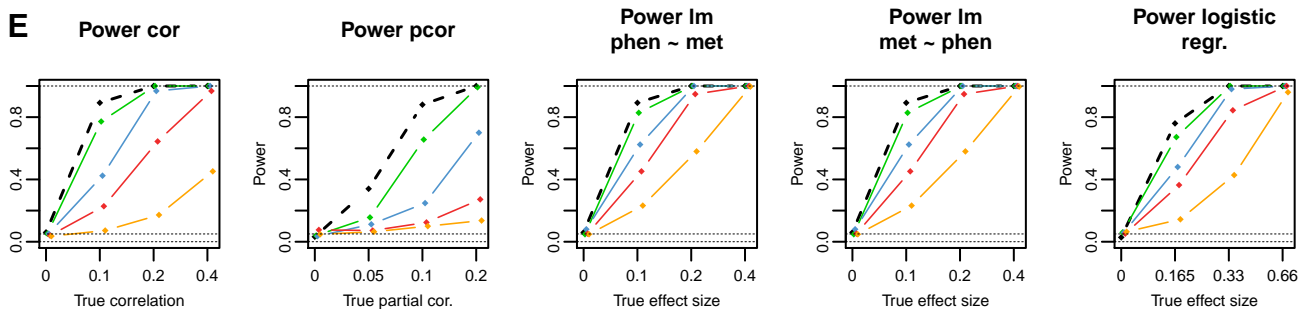
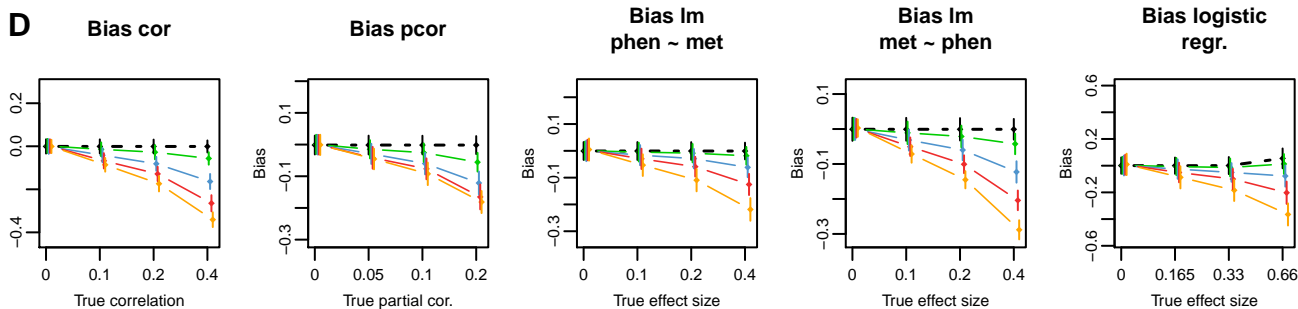
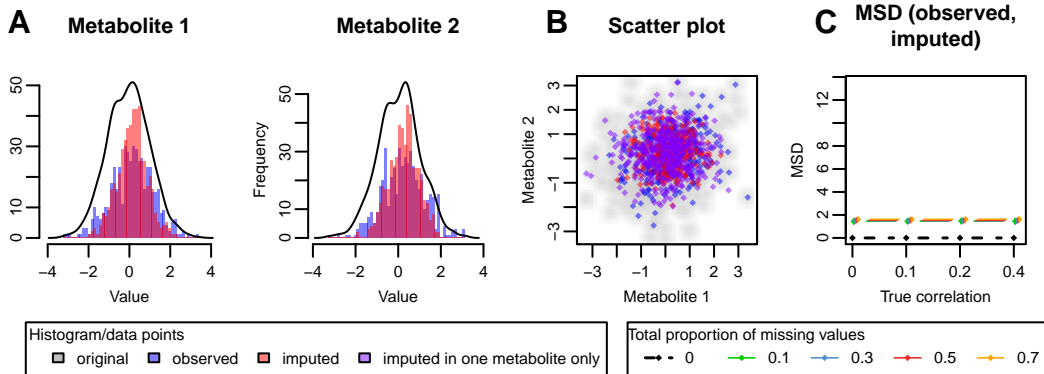


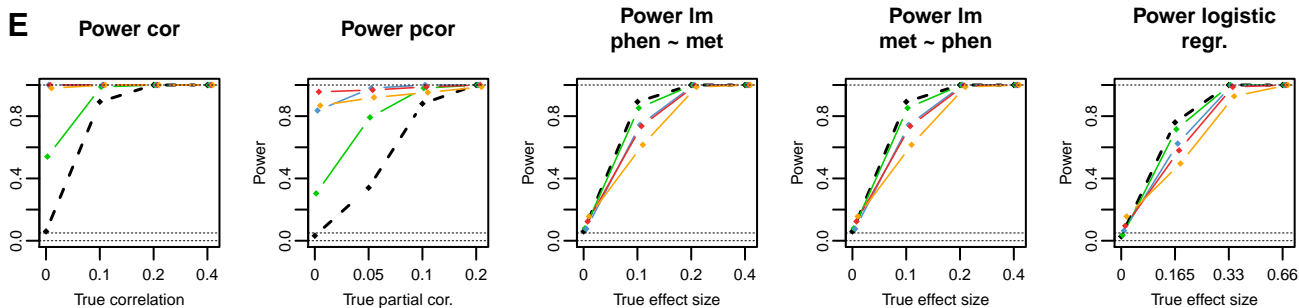
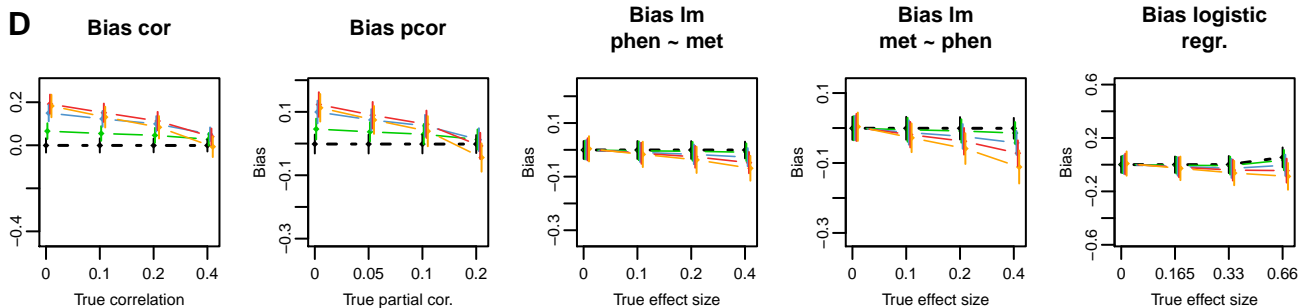
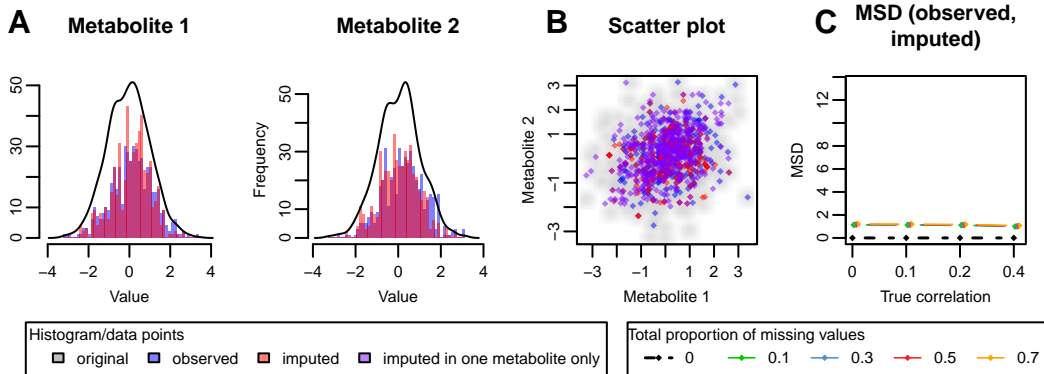


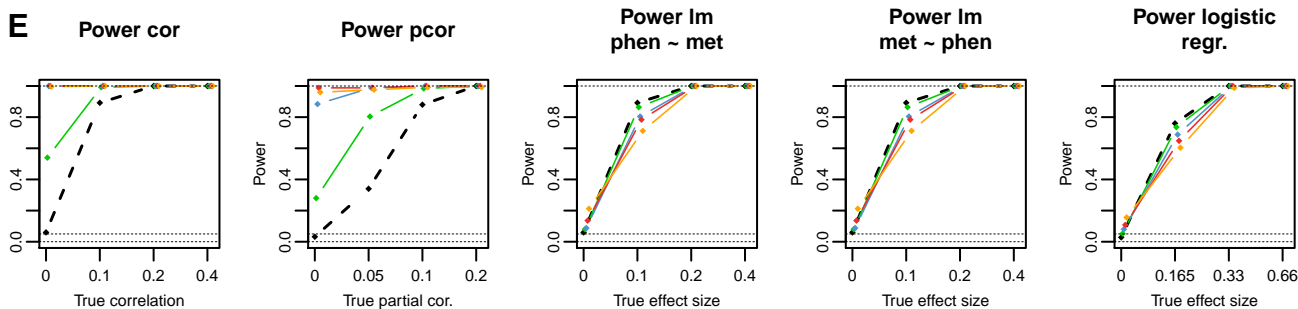
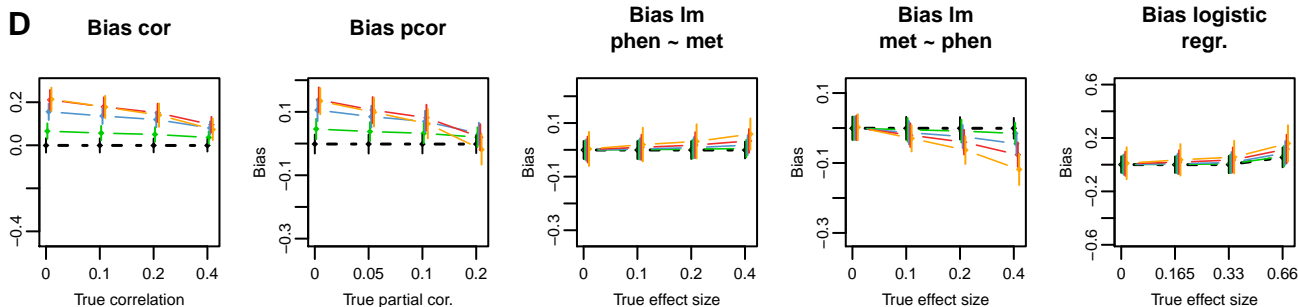
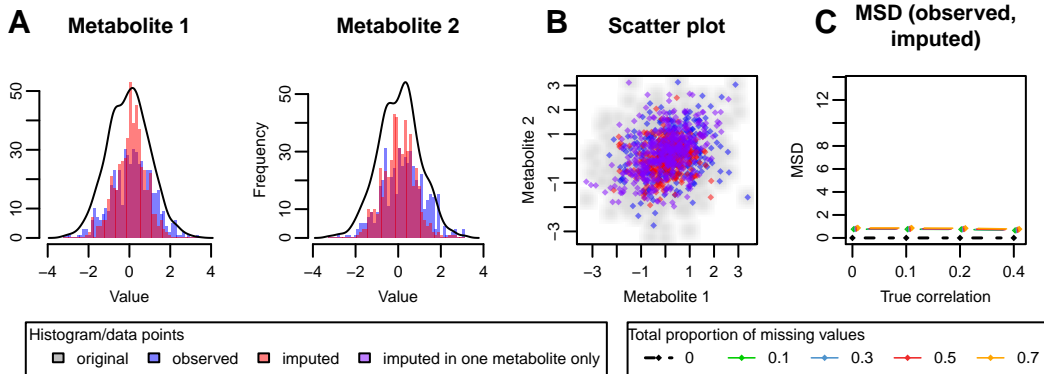


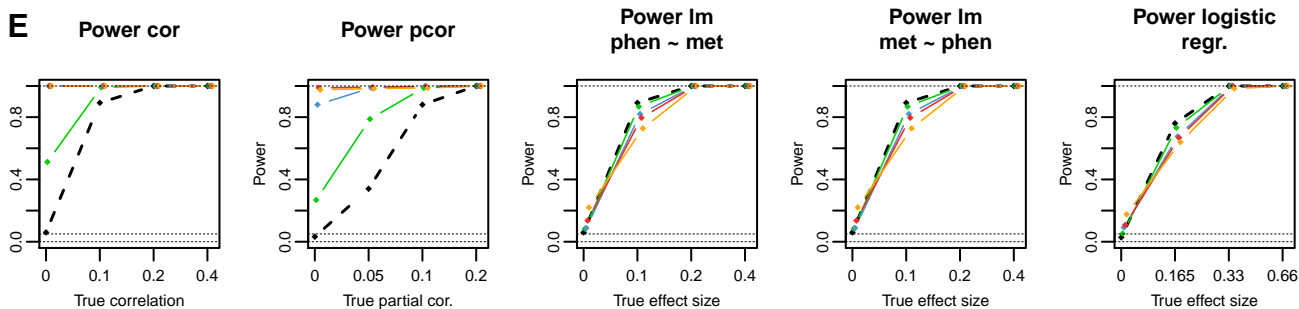
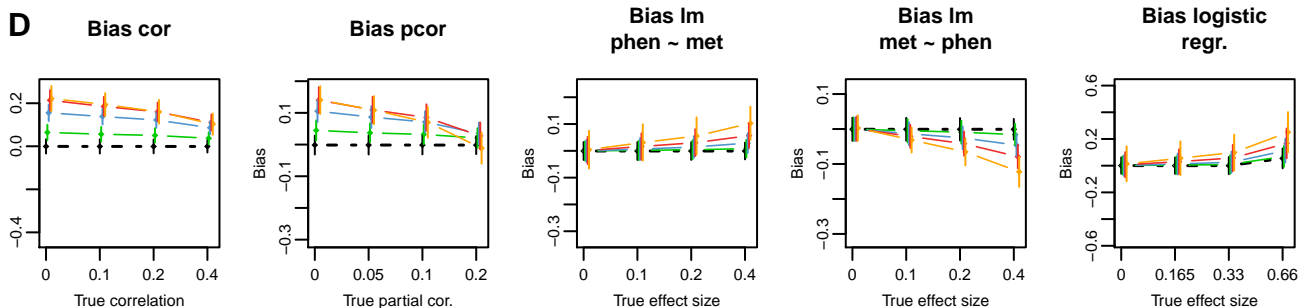
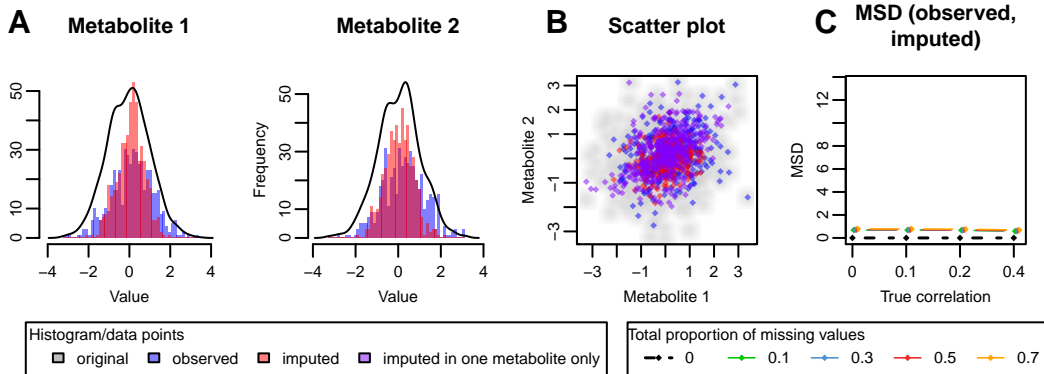


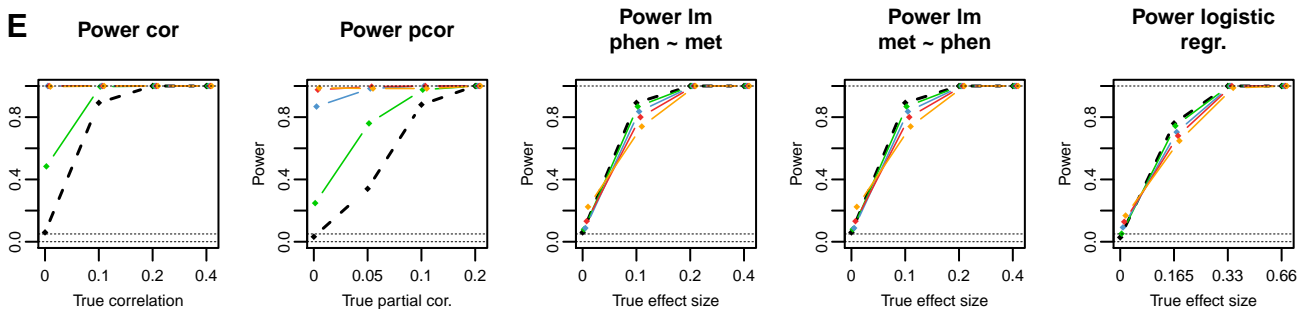
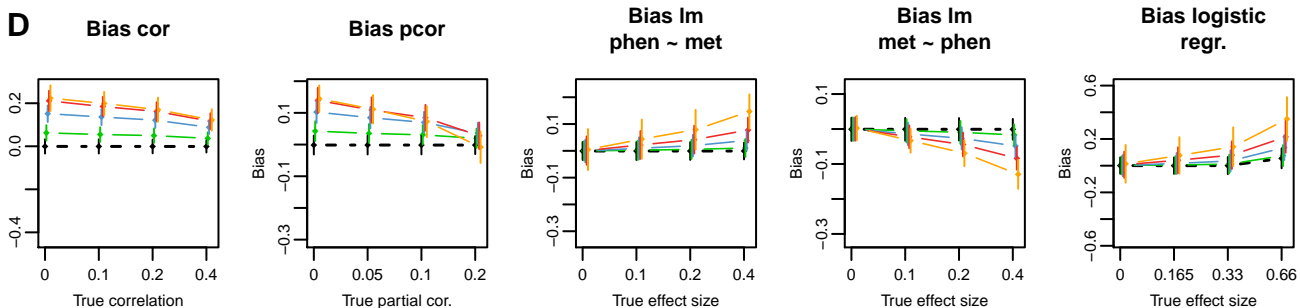
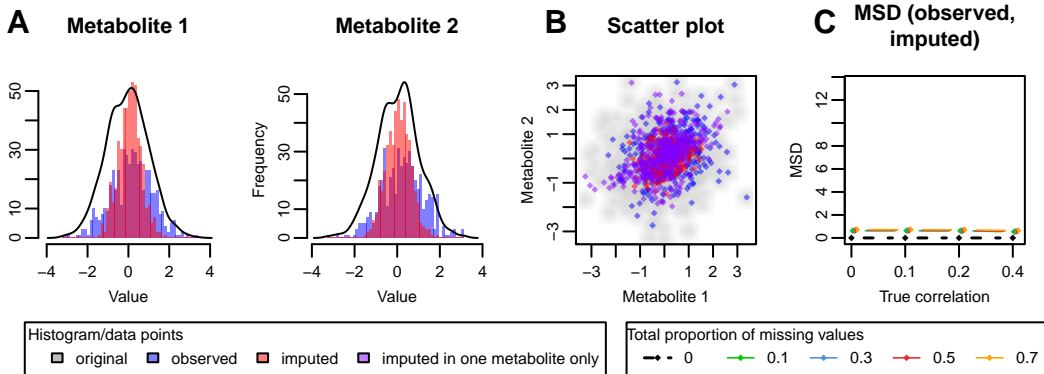


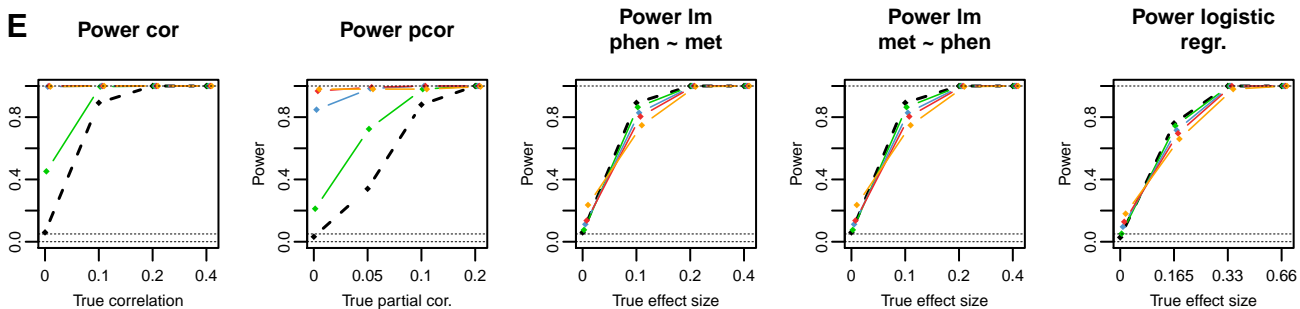
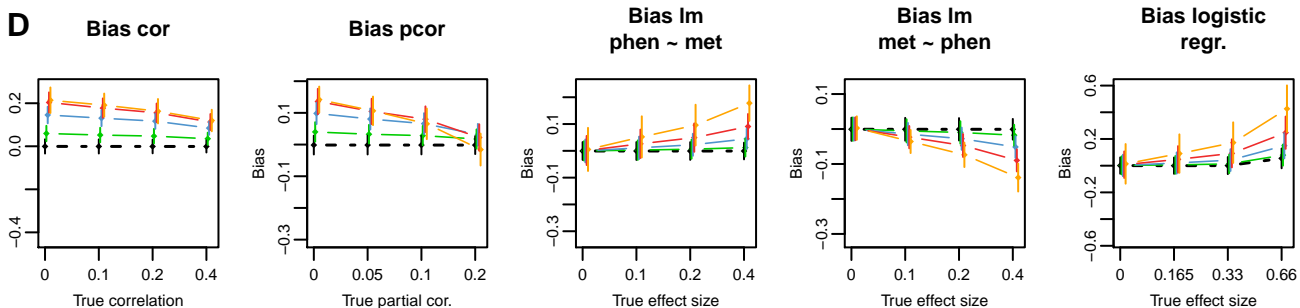
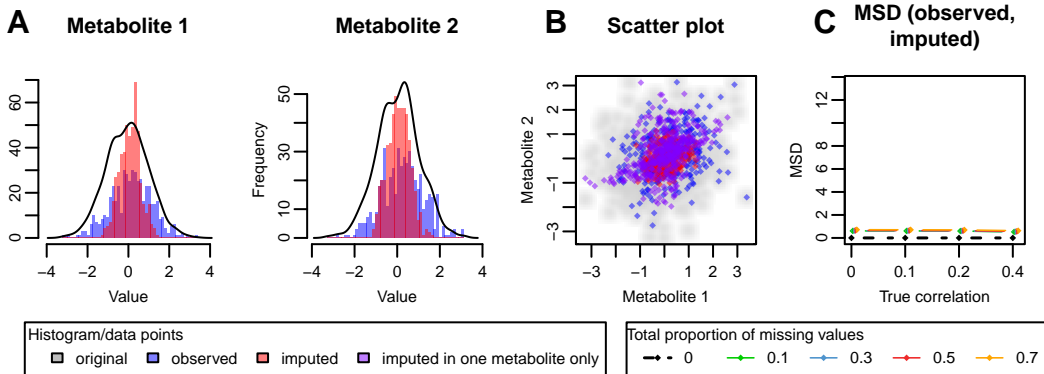


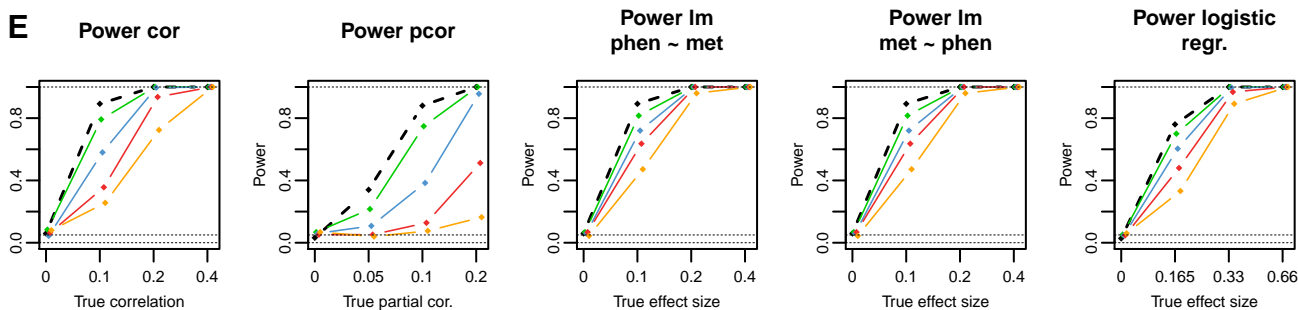
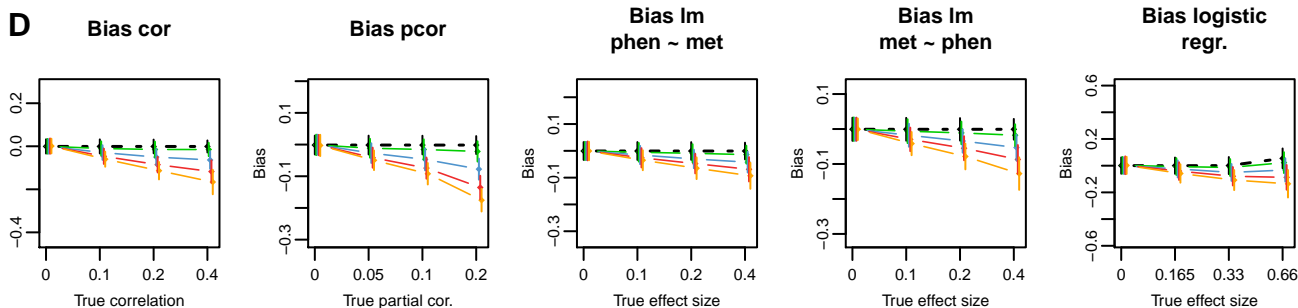
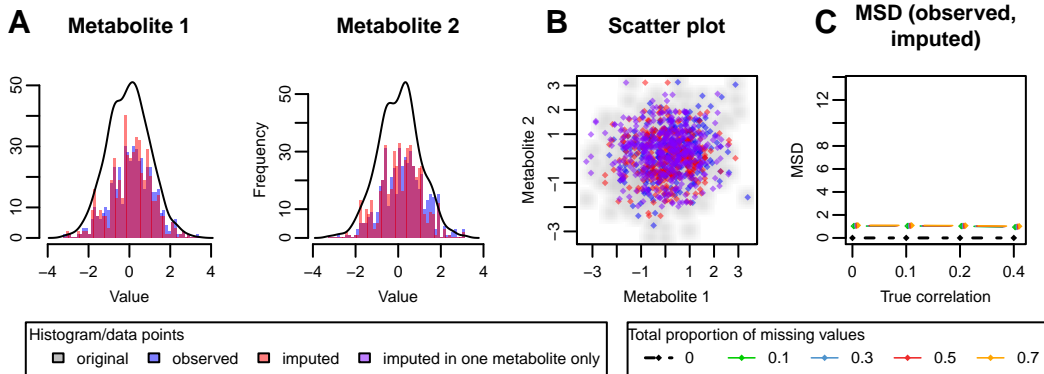


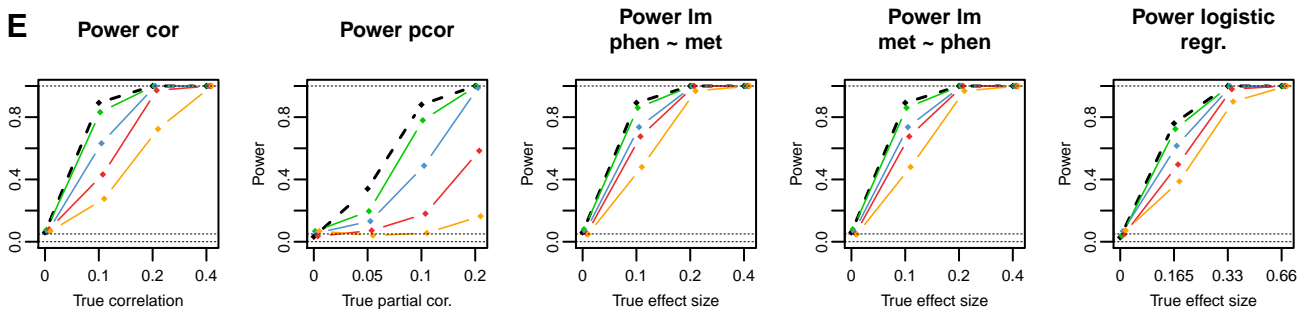
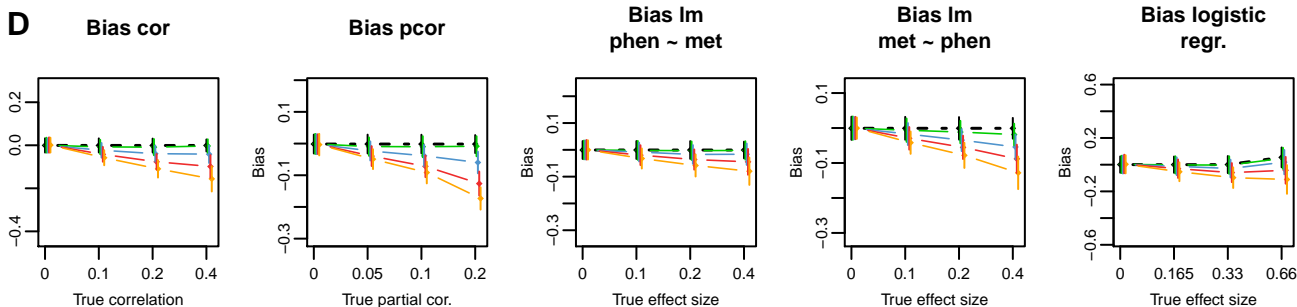
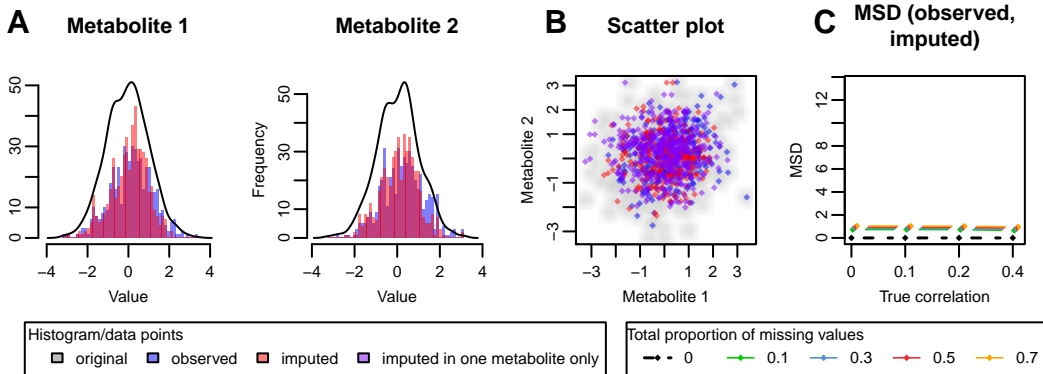


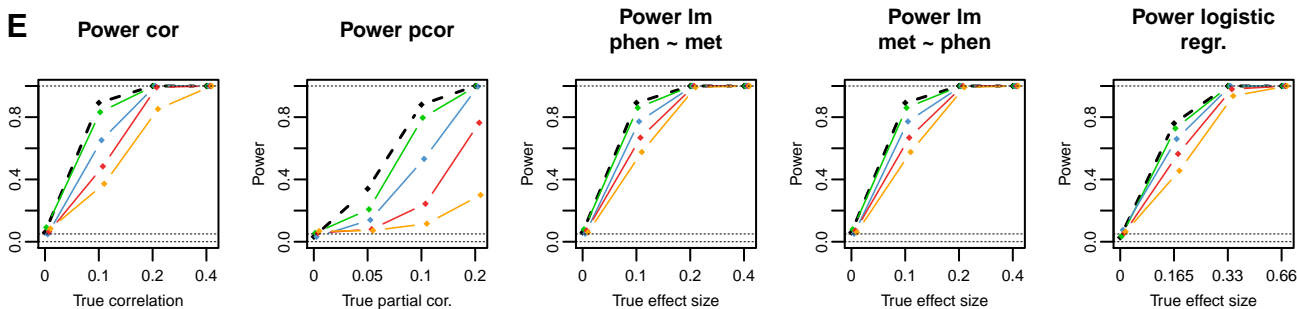
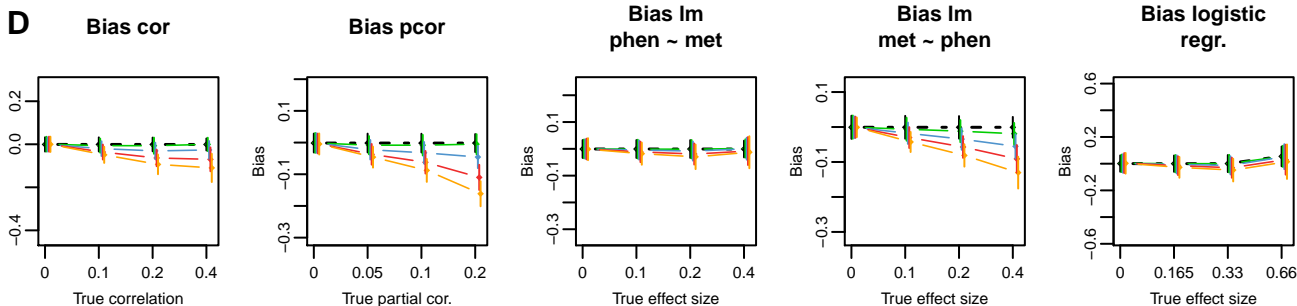
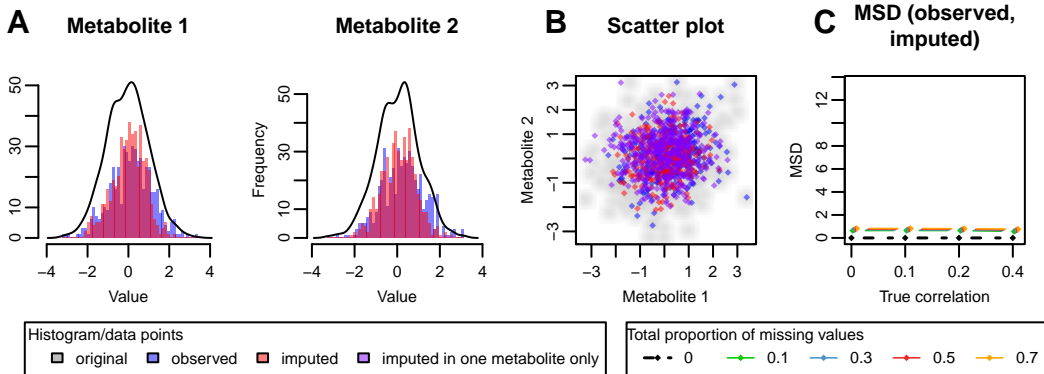


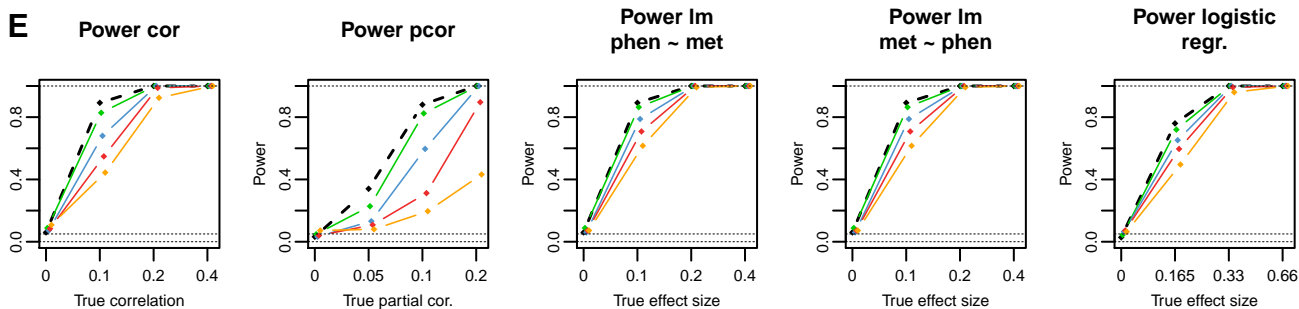
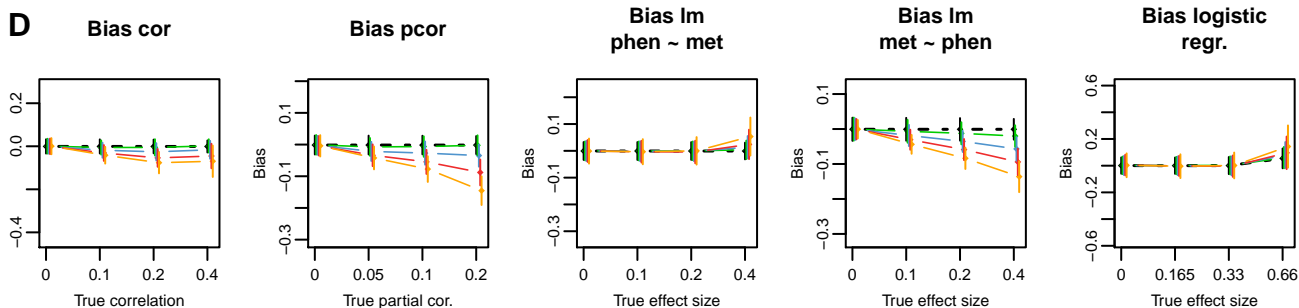
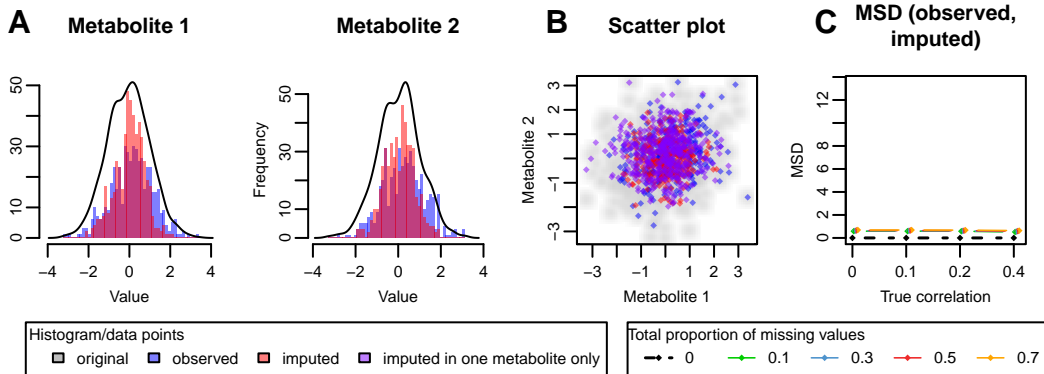


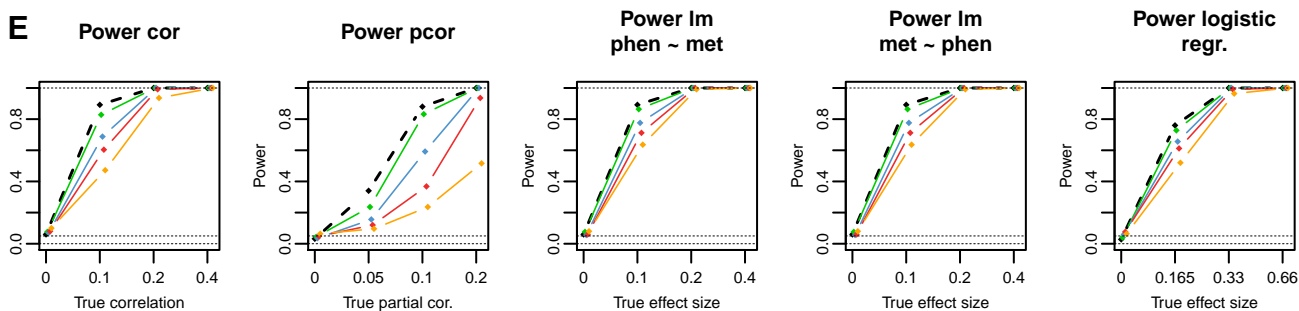
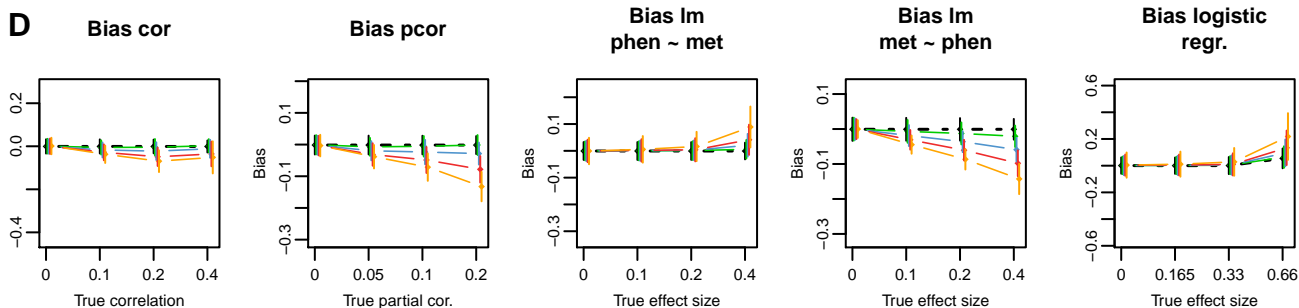
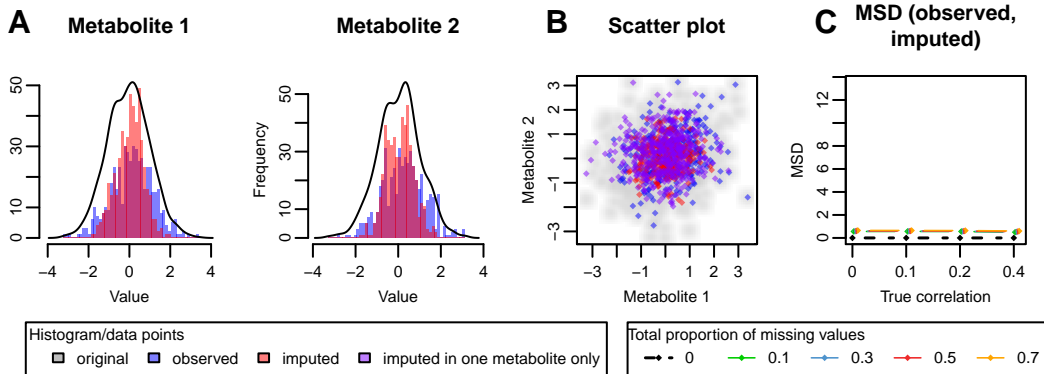


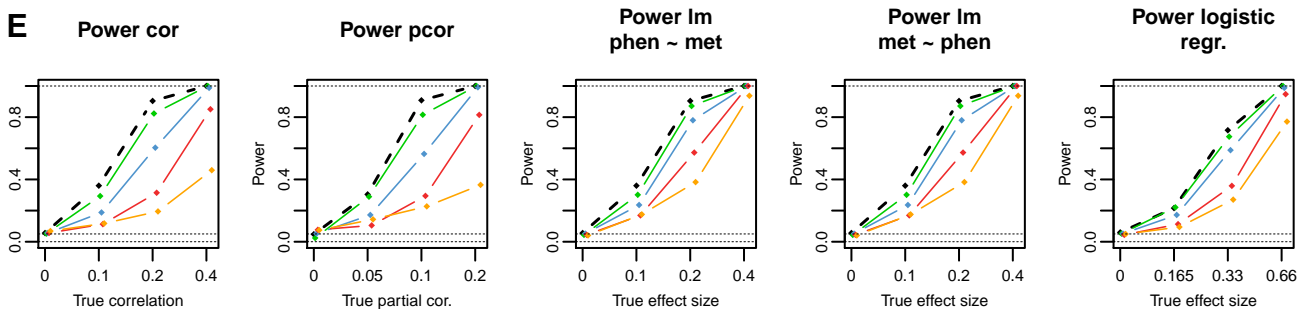
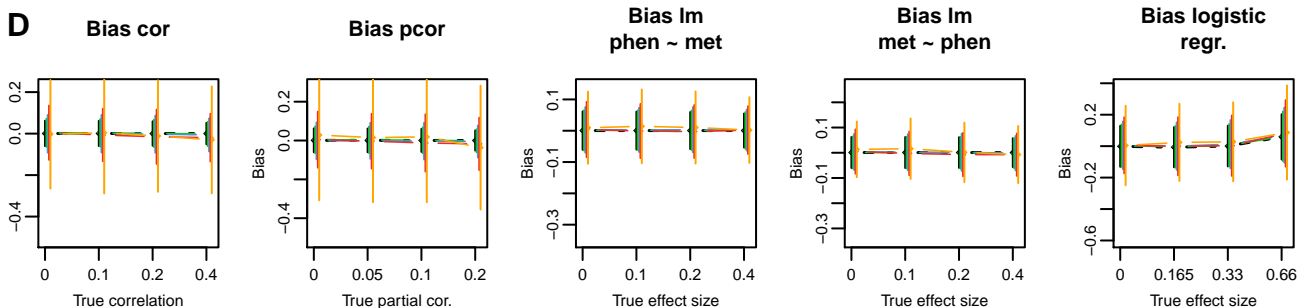
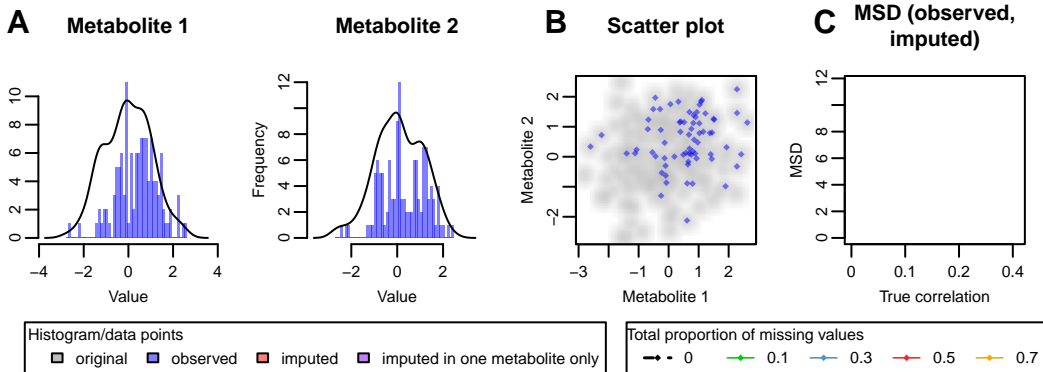


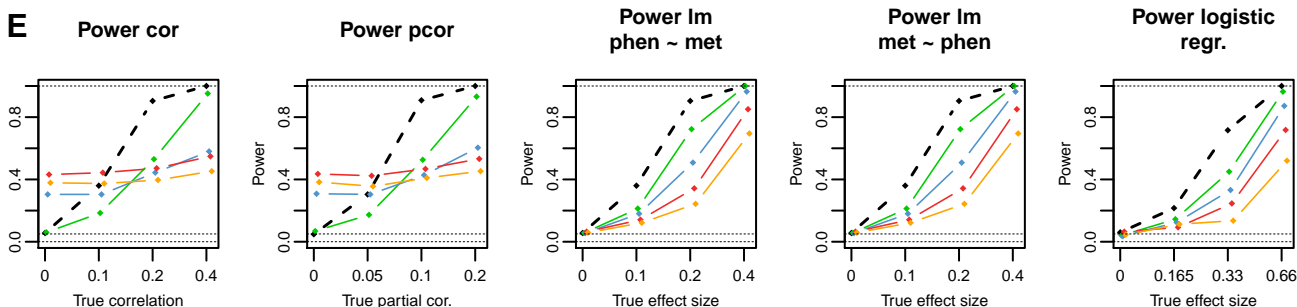
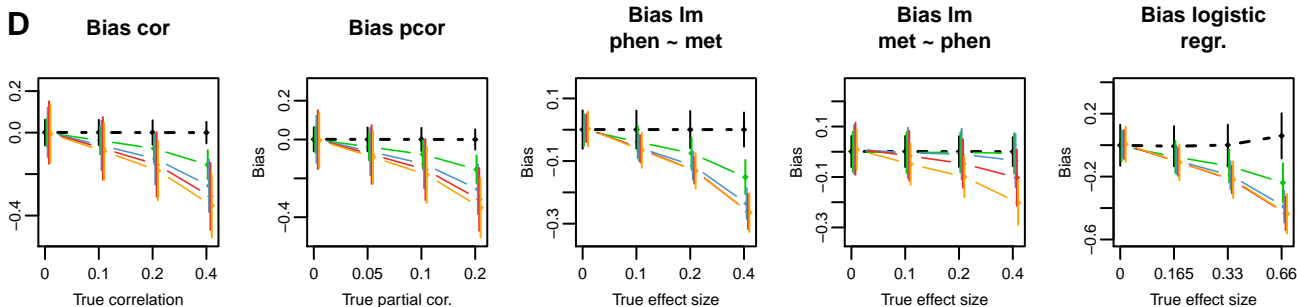
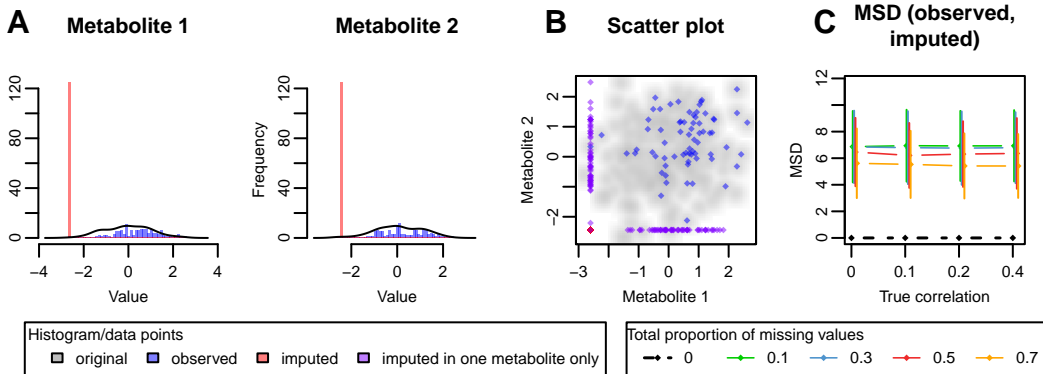


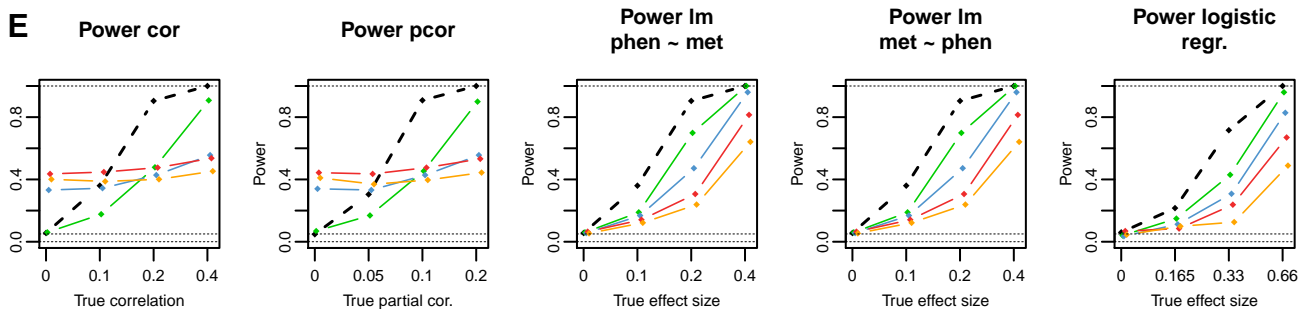
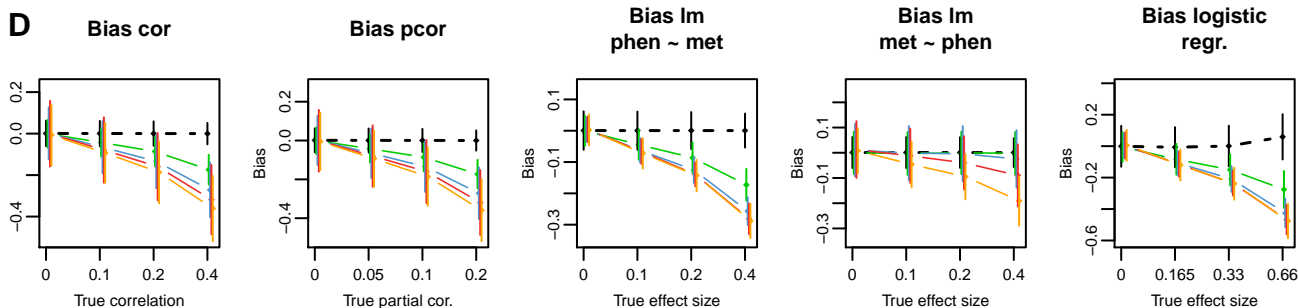
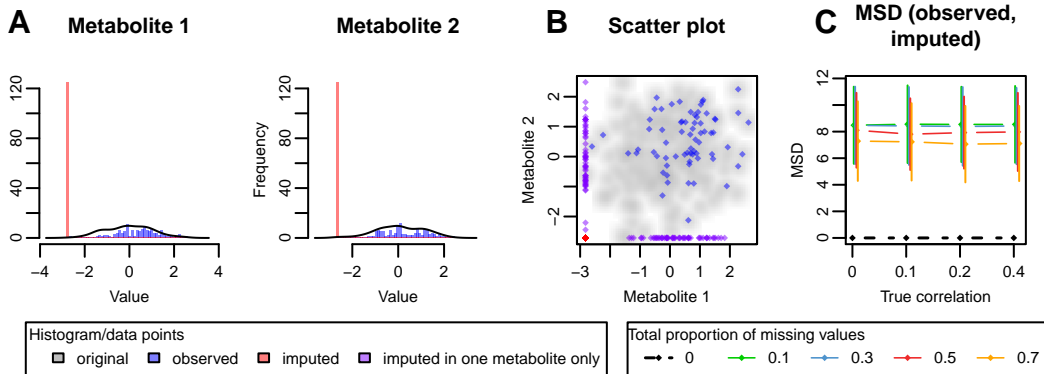


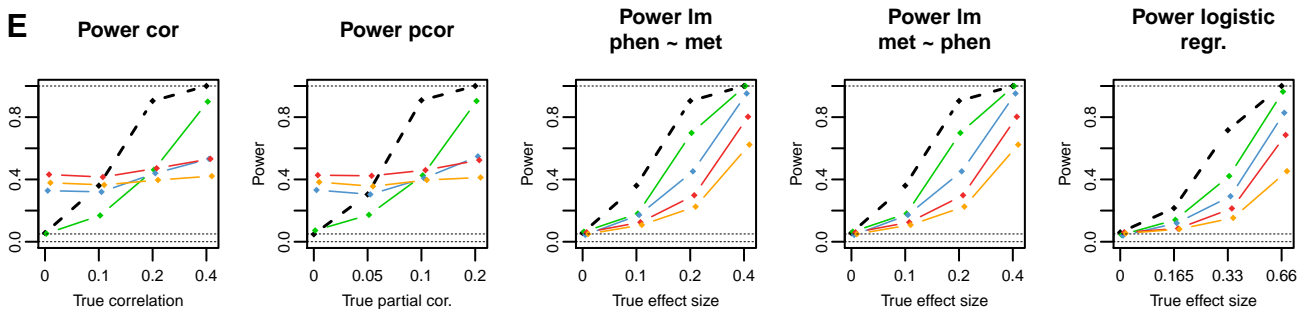
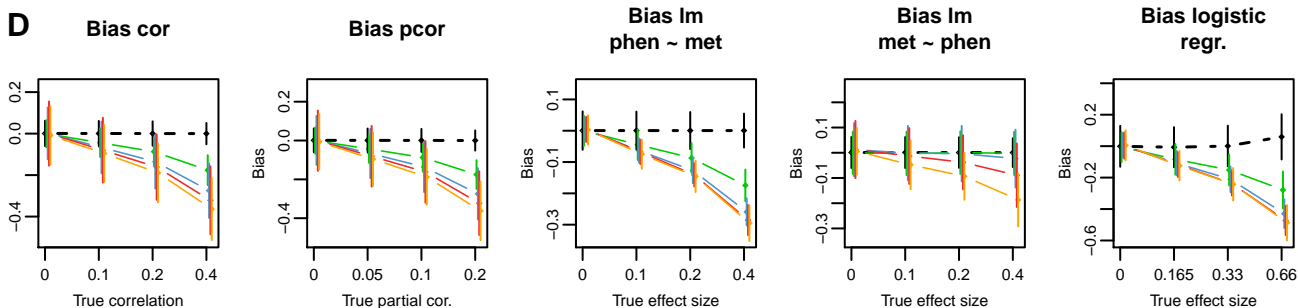
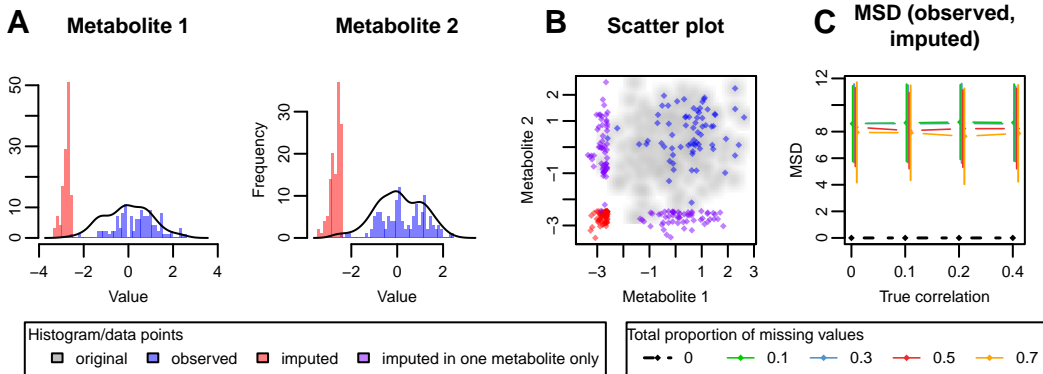


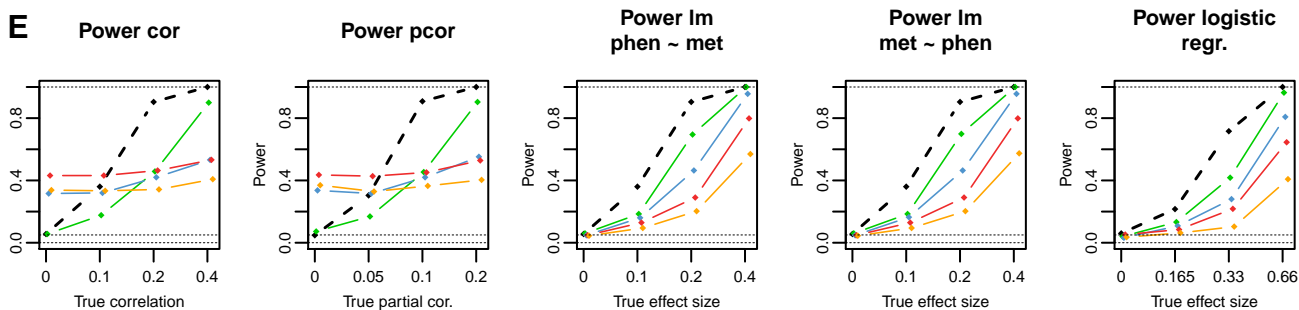
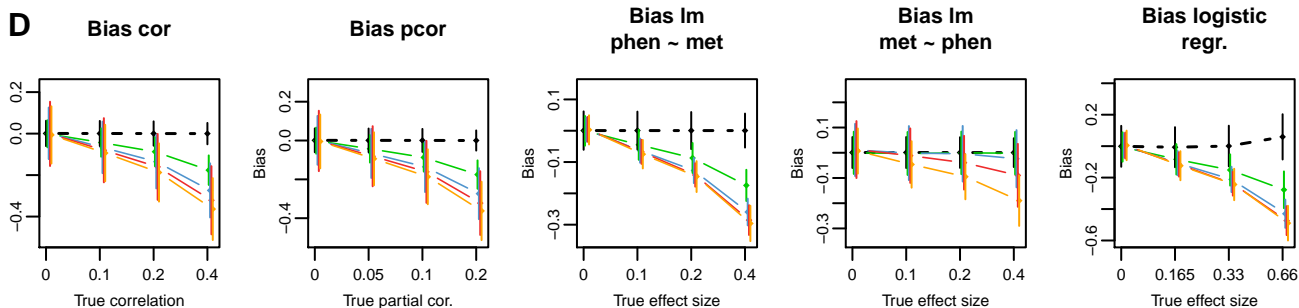
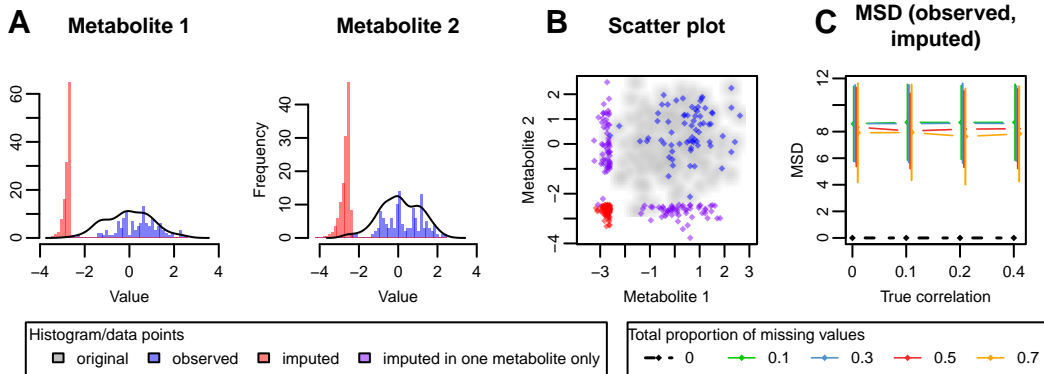


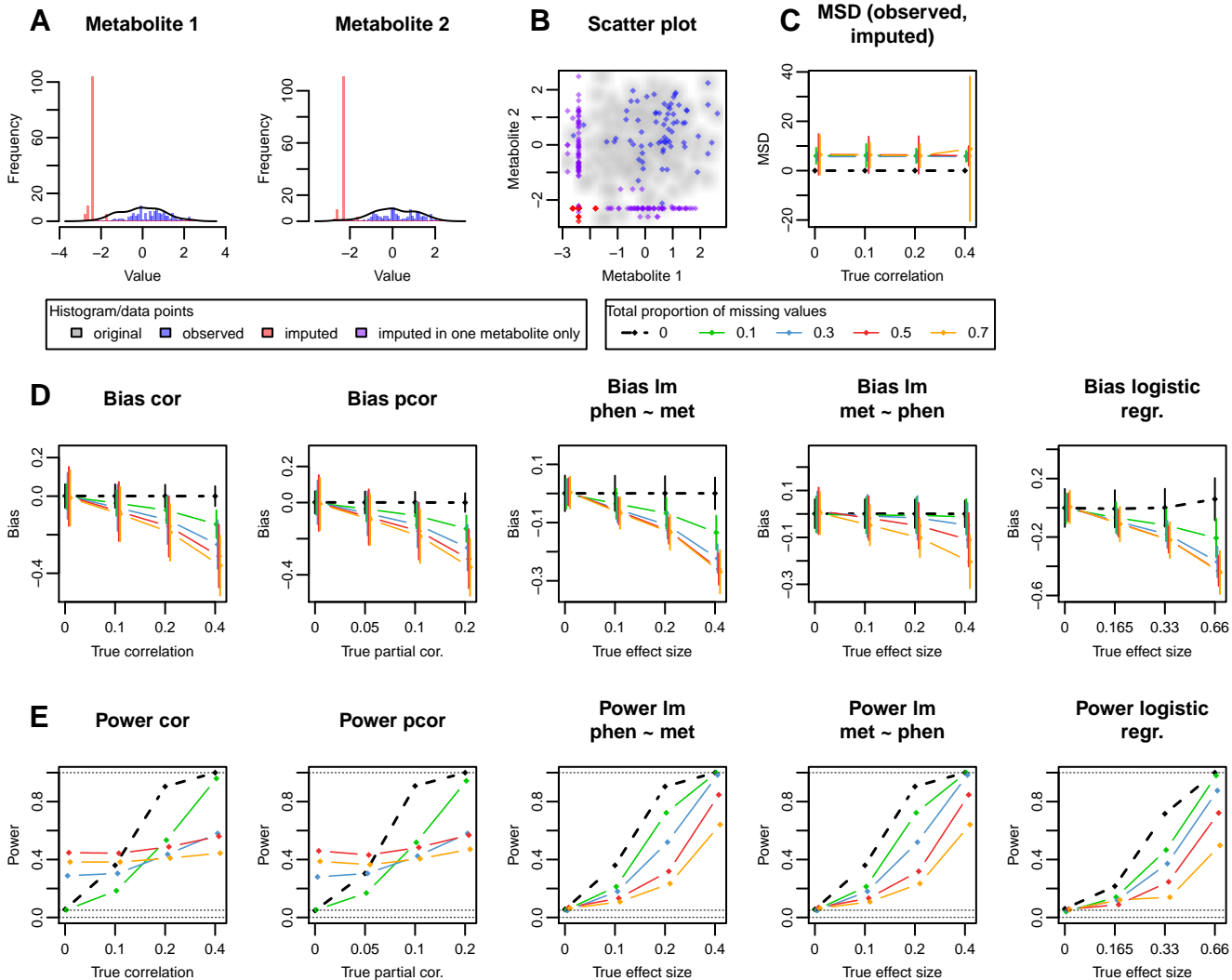


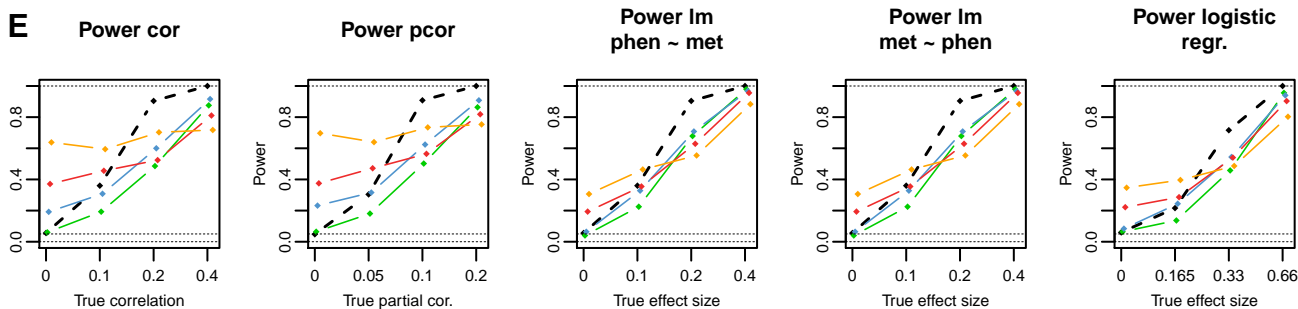
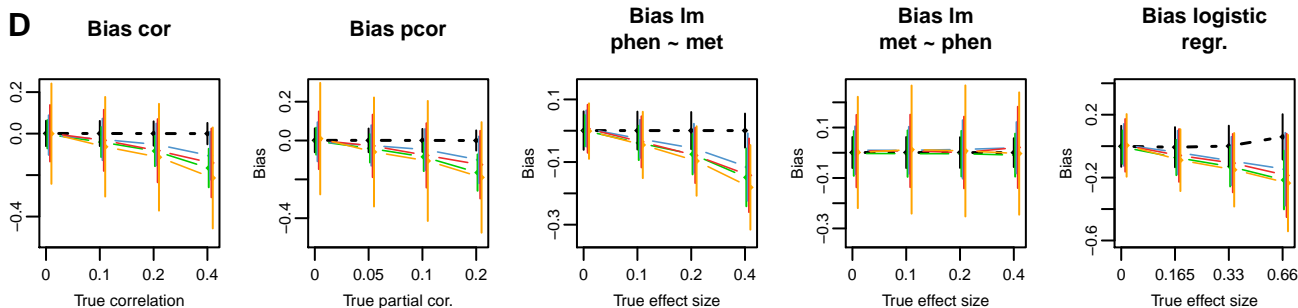
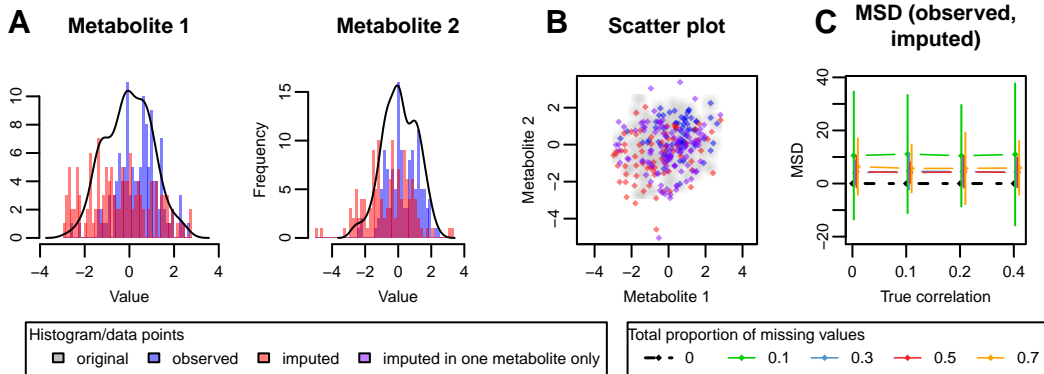


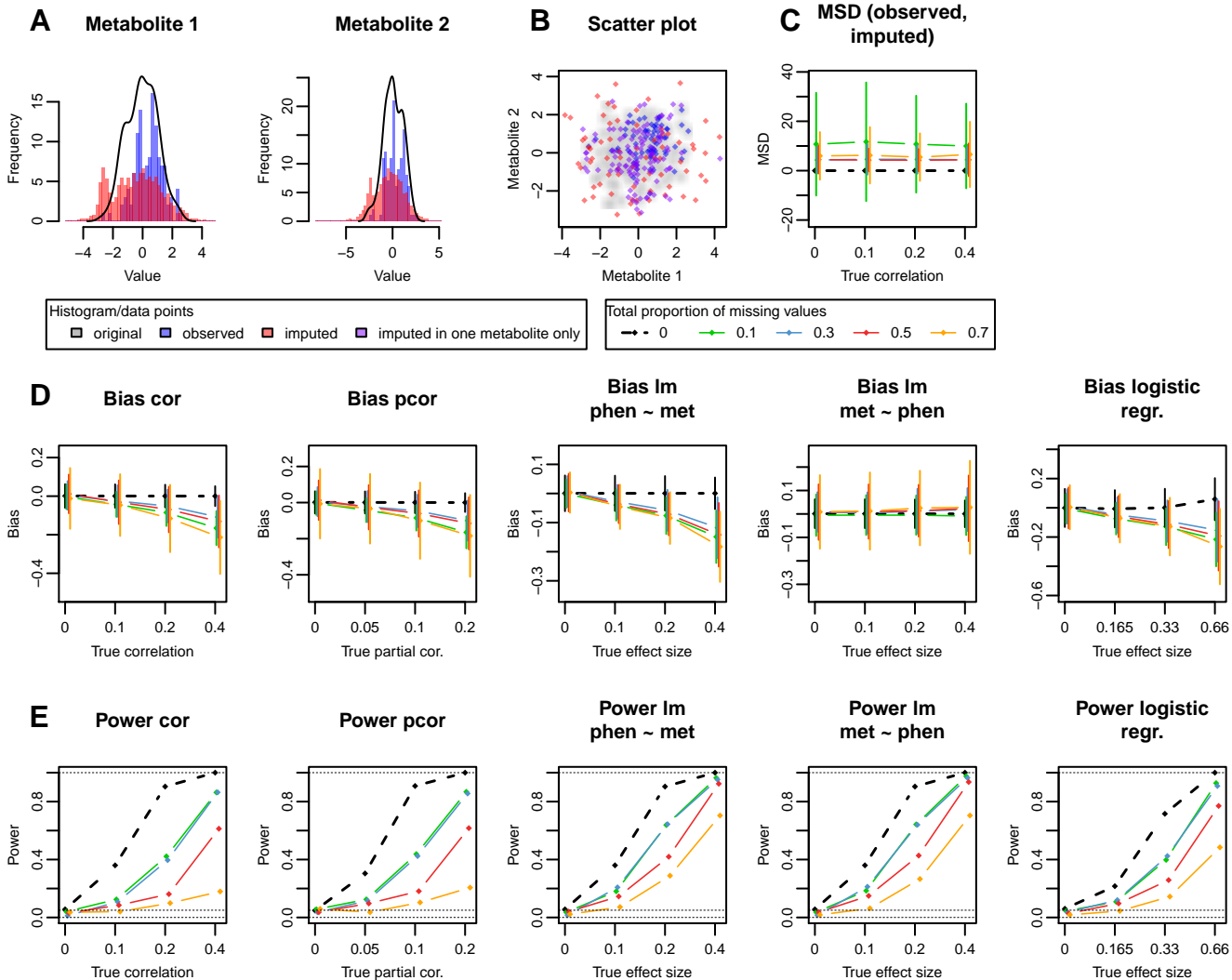


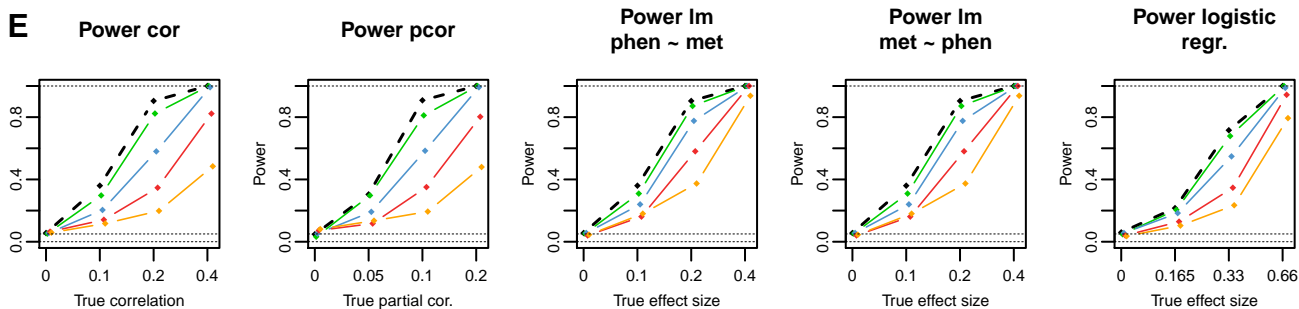
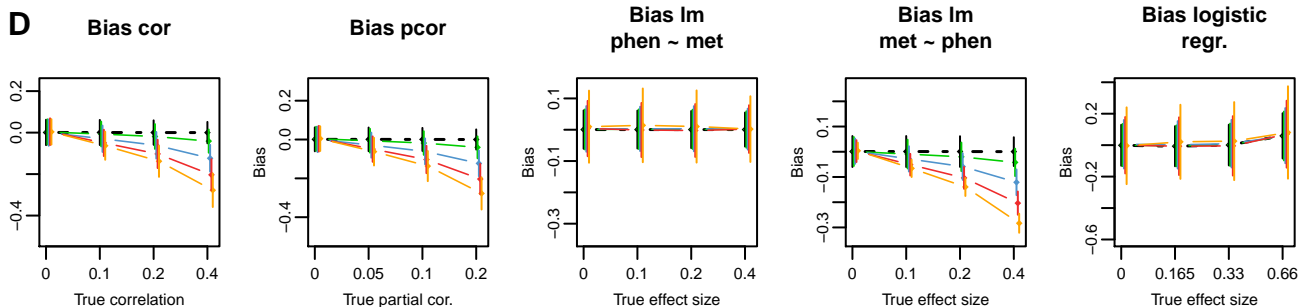
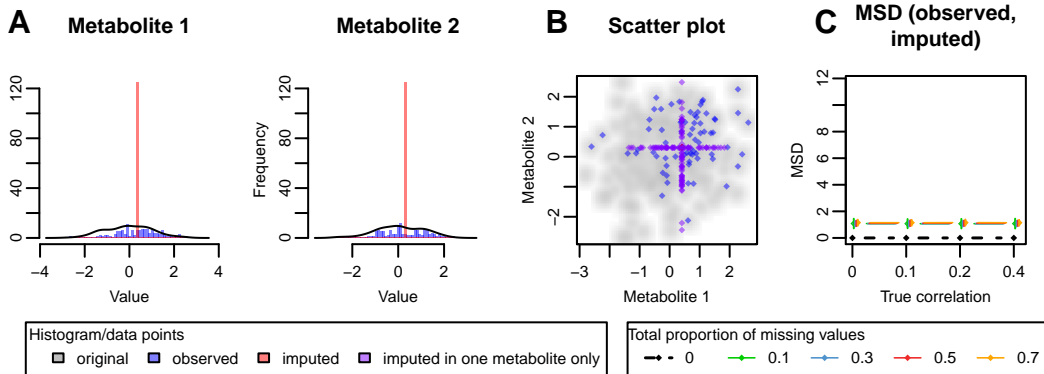


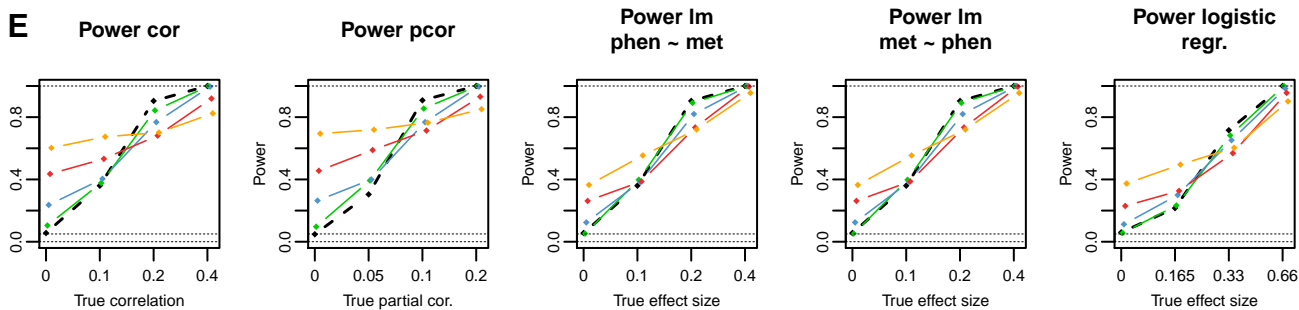
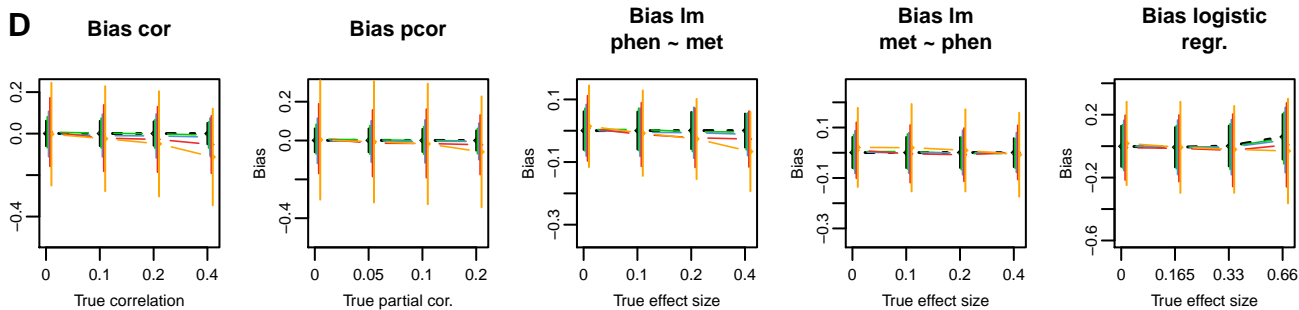
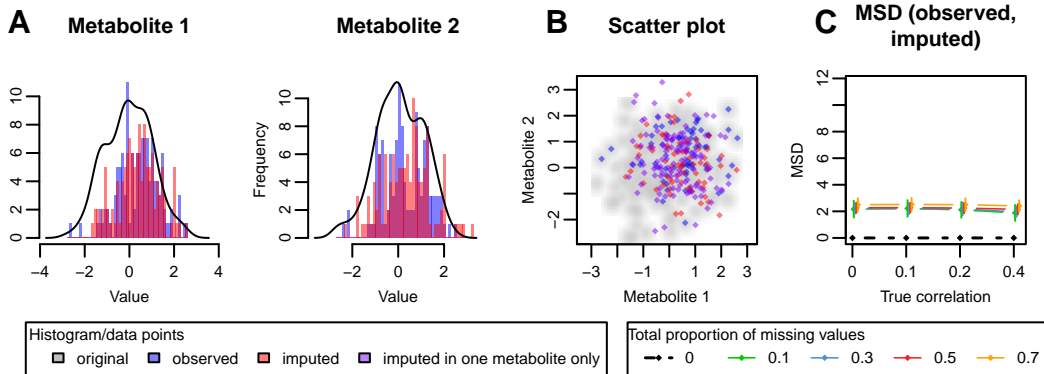




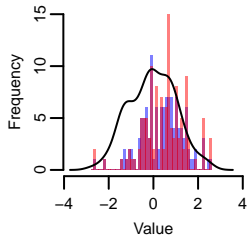




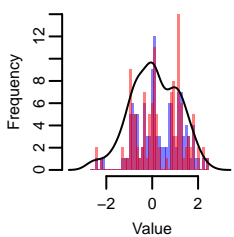




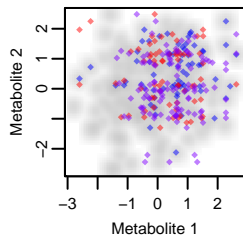
A Metabolite 1



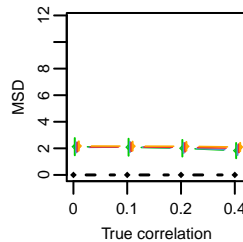
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



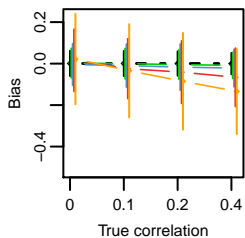
Histogram/data points

original observed imputed imputed in one metabolite only

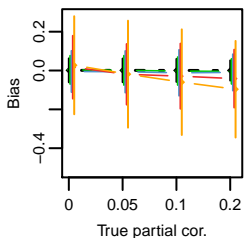
Total proportion of missing values

0 0.1 0.3 0.5 0.7

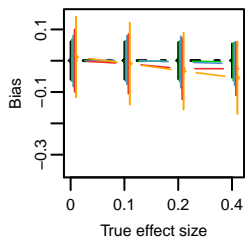
D Bias cor



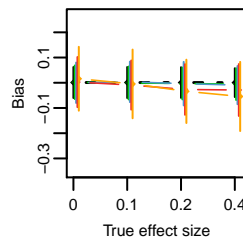
Bias pcor



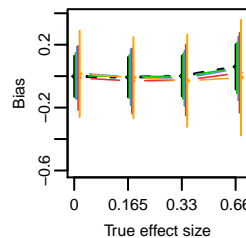
Bias lm phen ~ met



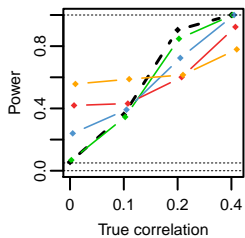
Bias lm met ~ phen



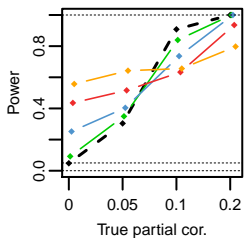
Bias logistic regr.



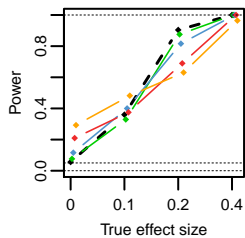
E Power cor



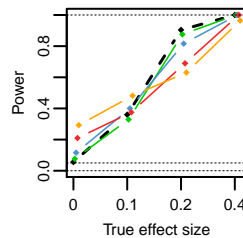
Power pcor



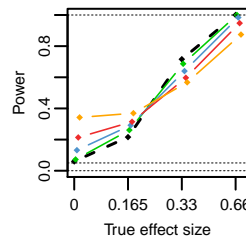
Power lm phen ~ met



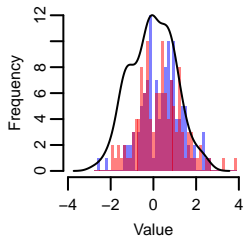
Power lm met ~ phen



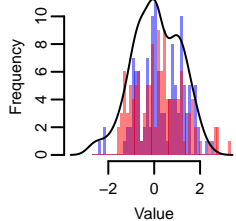
Power logistic regr.



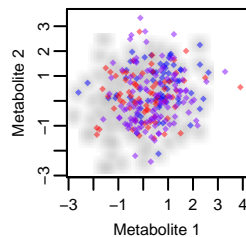
A Metabolite 1



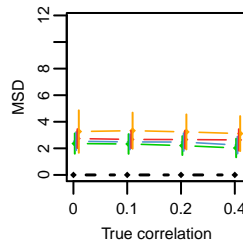
Metabolite 2



B Scatter plot



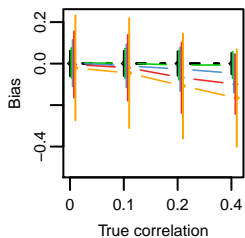
C MSD (observed, imputed)



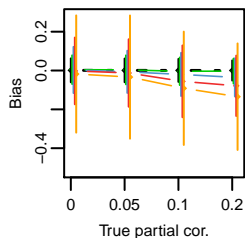
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 - - 0 — 0.1 — 0.3 — 0.5 — 0.7

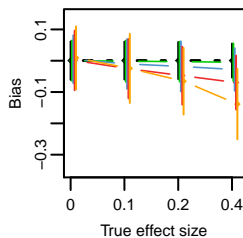
D Bias cor



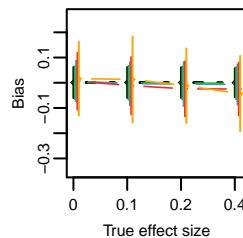
Bias pcor



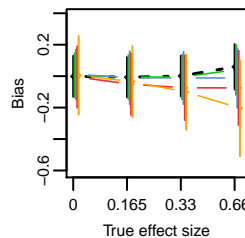
Bias lm phen ~ met



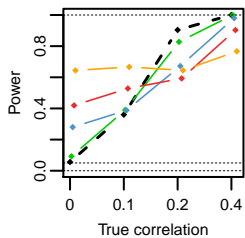
Bias lm met ~ phen



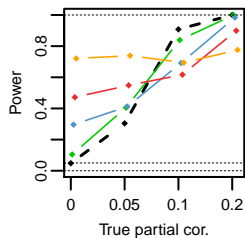
Bias logistic regr.



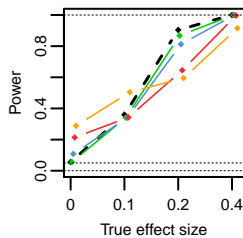
E Power cor



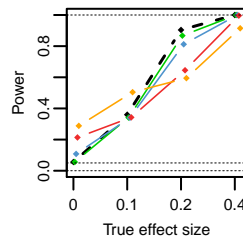
Power pcor



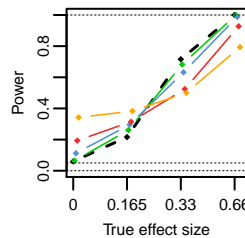
Power lm phen ~ met

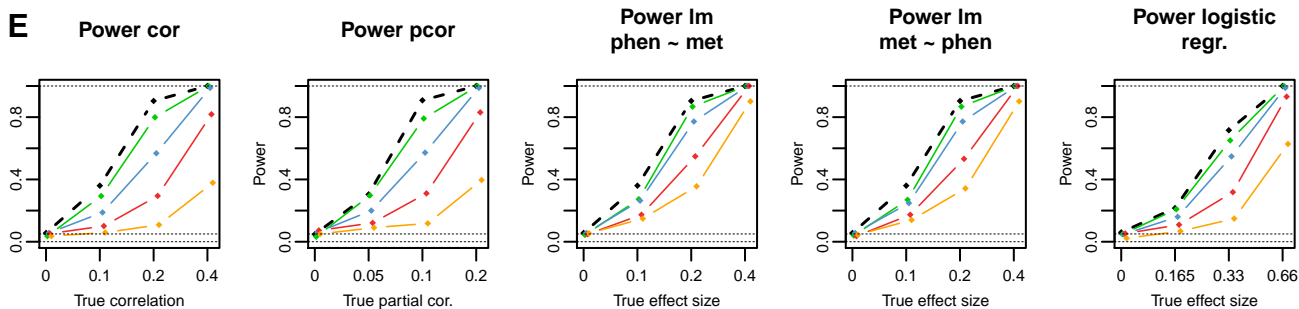
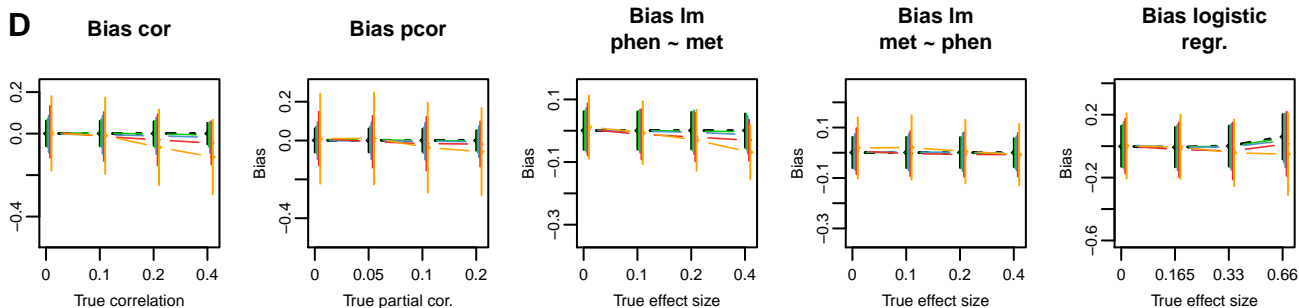
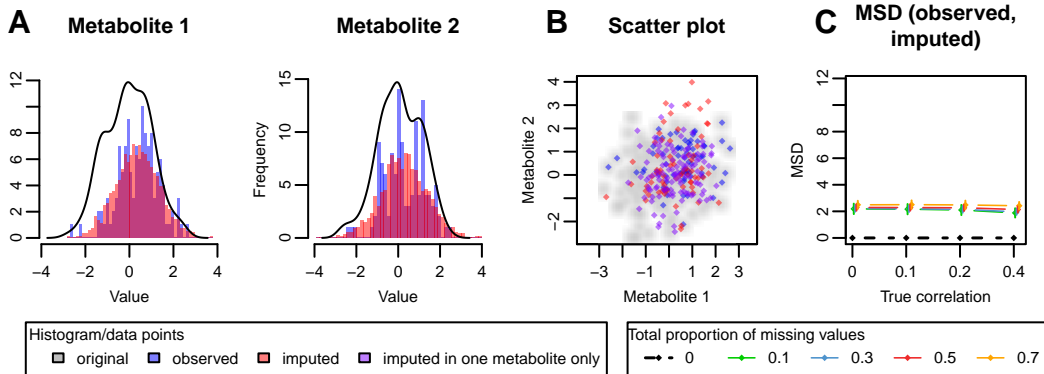


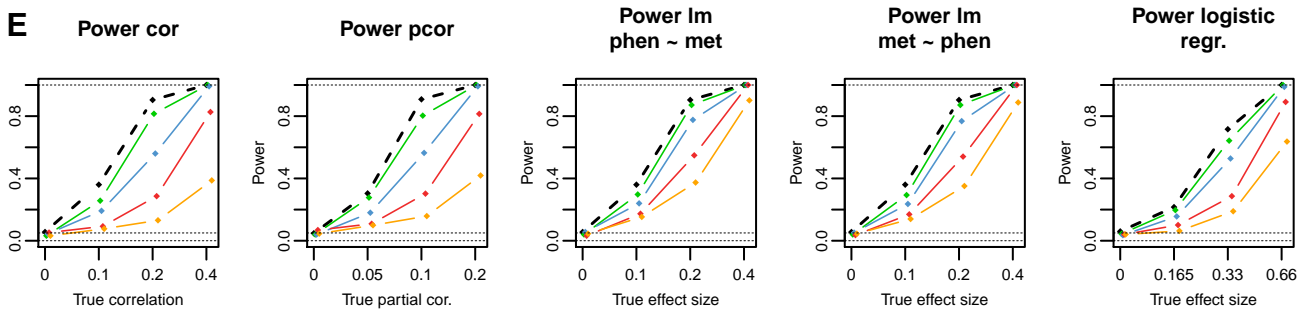
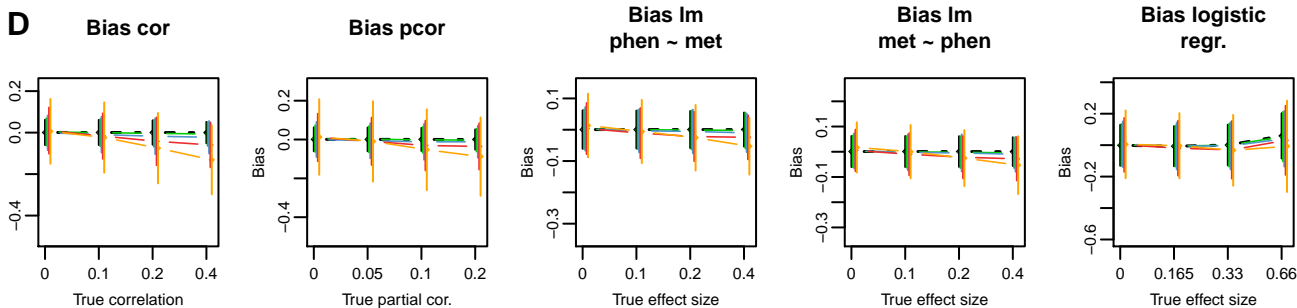
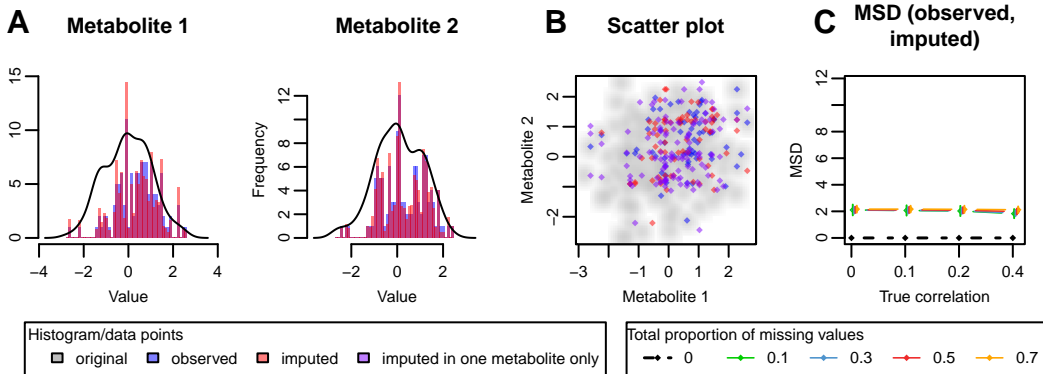
Power lm met ~ phen

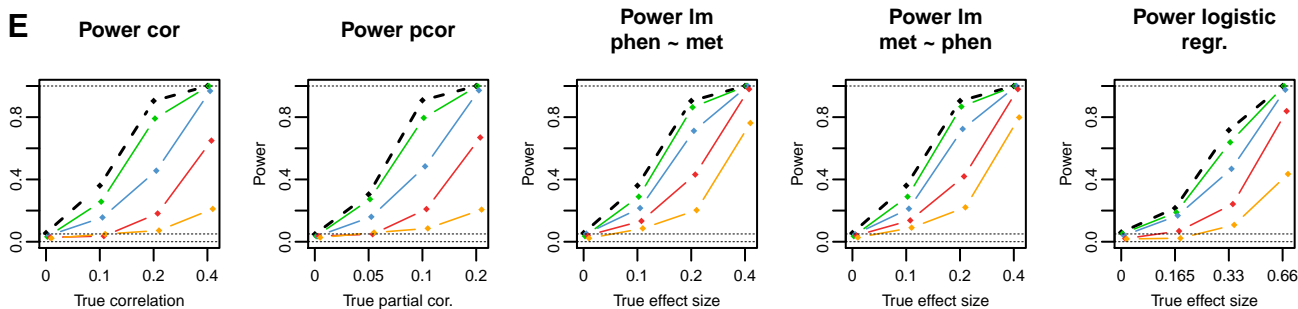
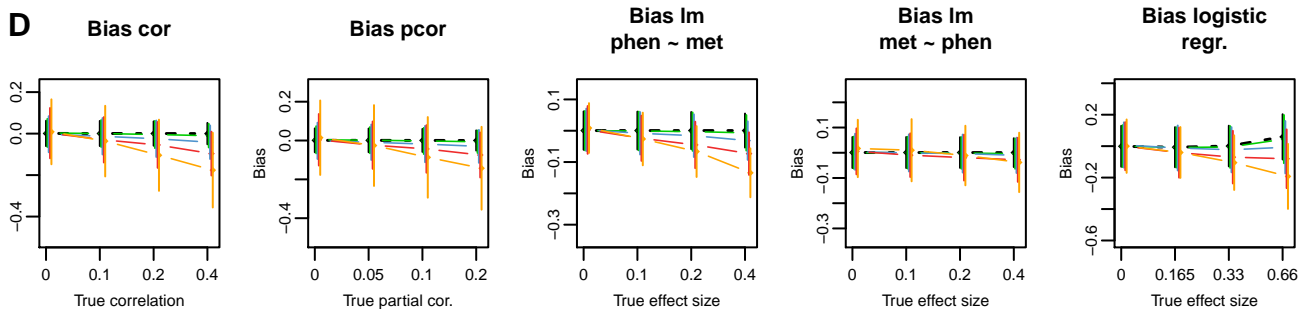
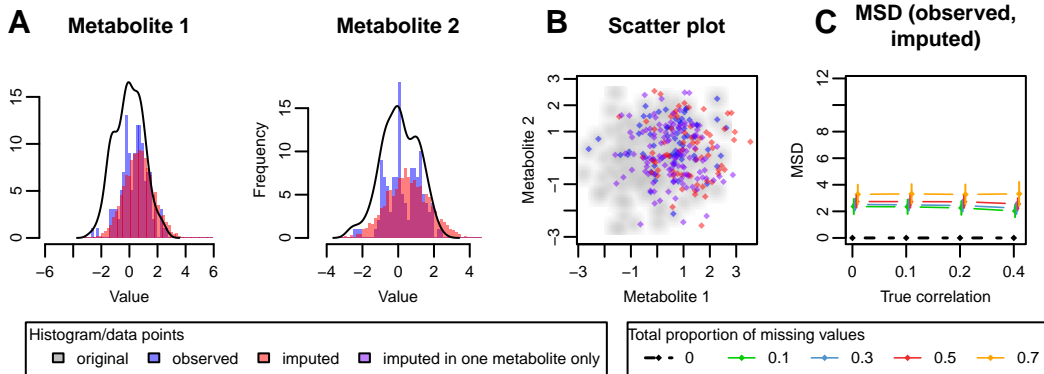


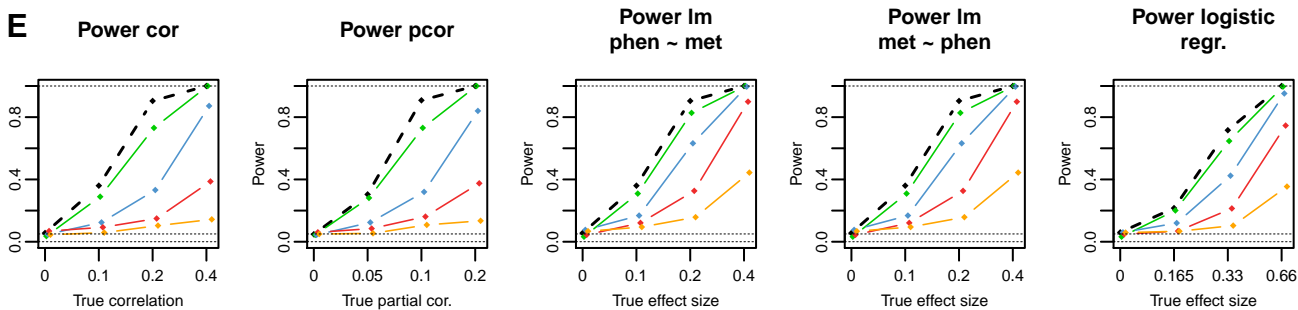
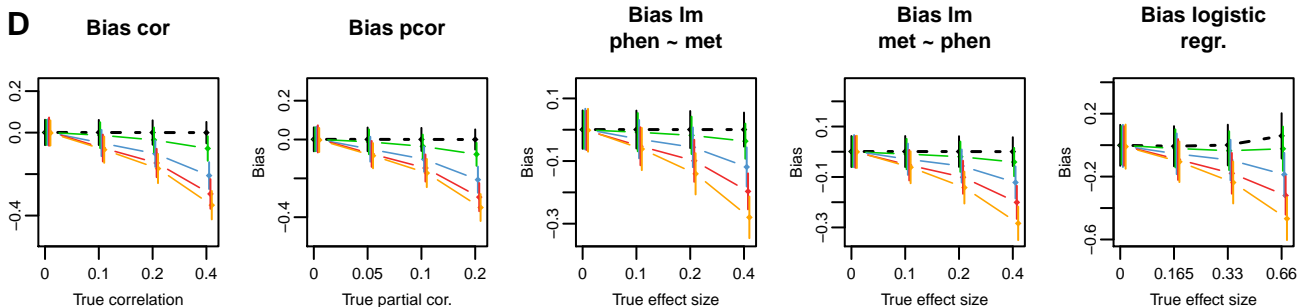
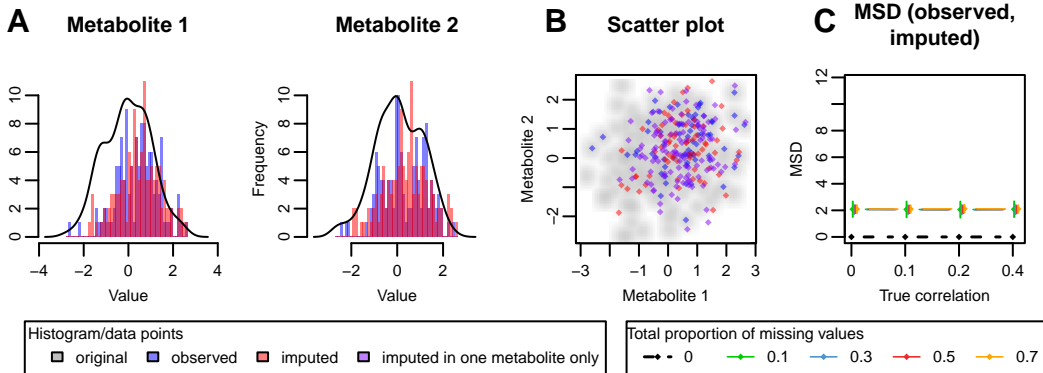
Power logistic regr.

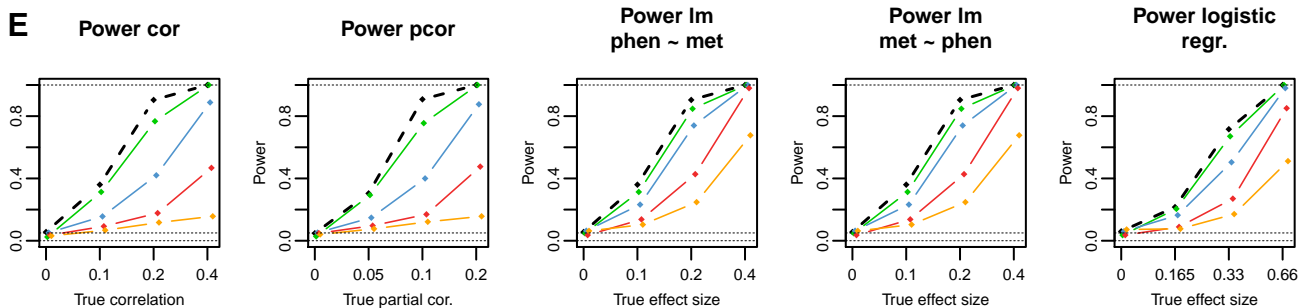
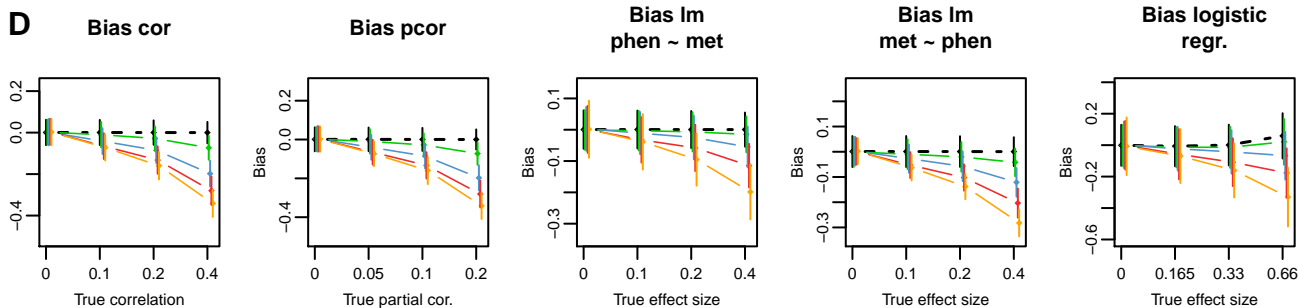
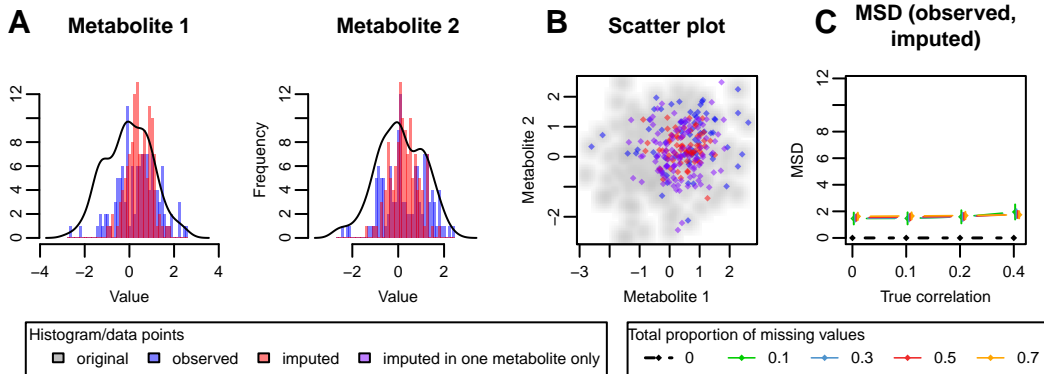


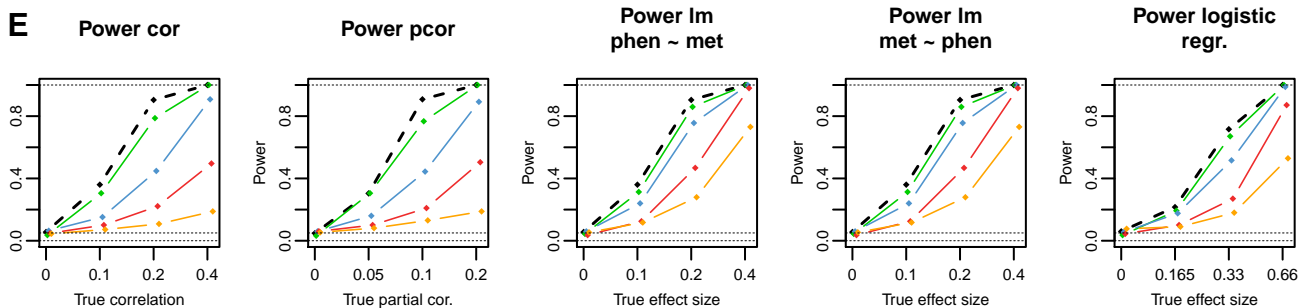
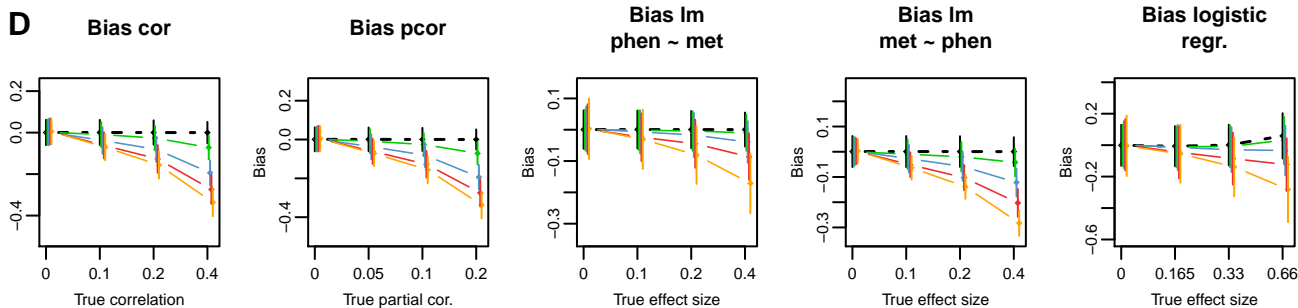
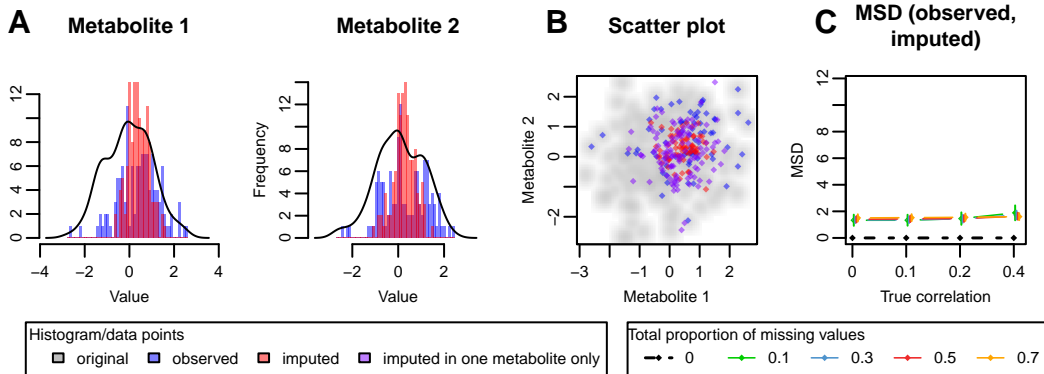


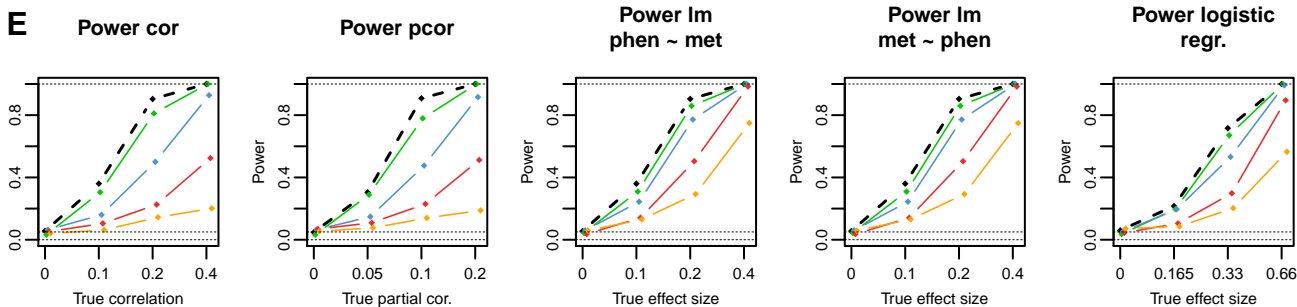
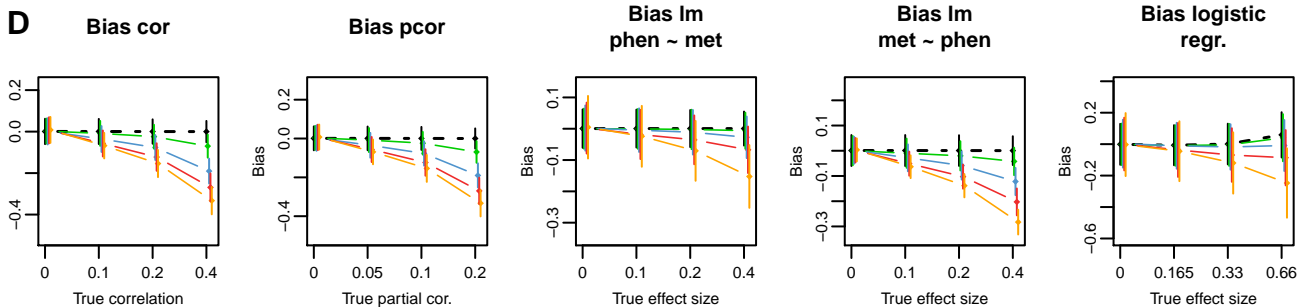
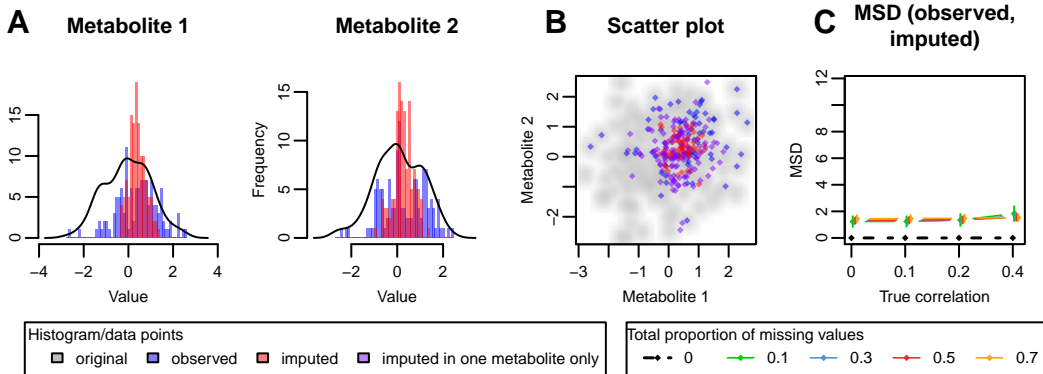


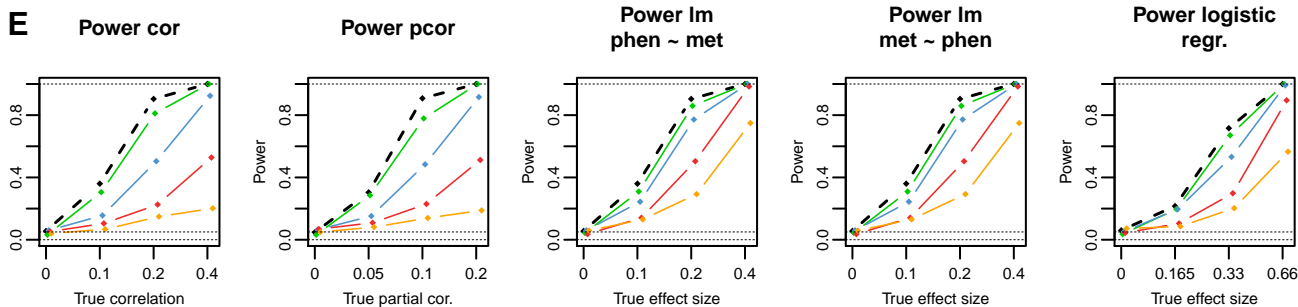
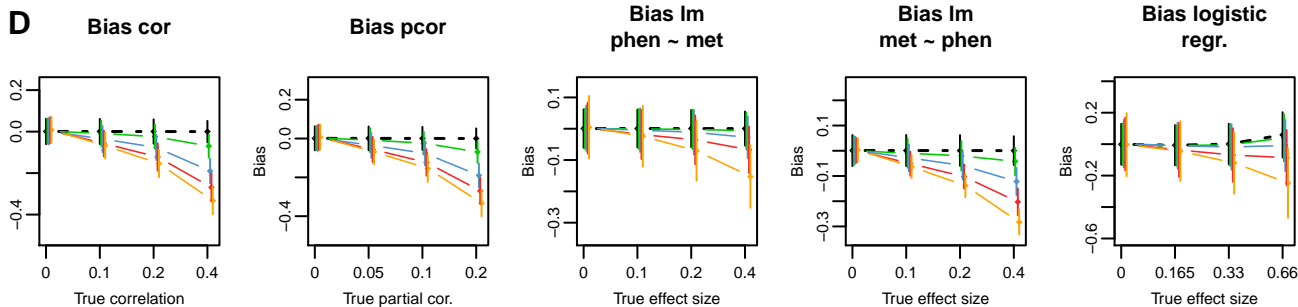
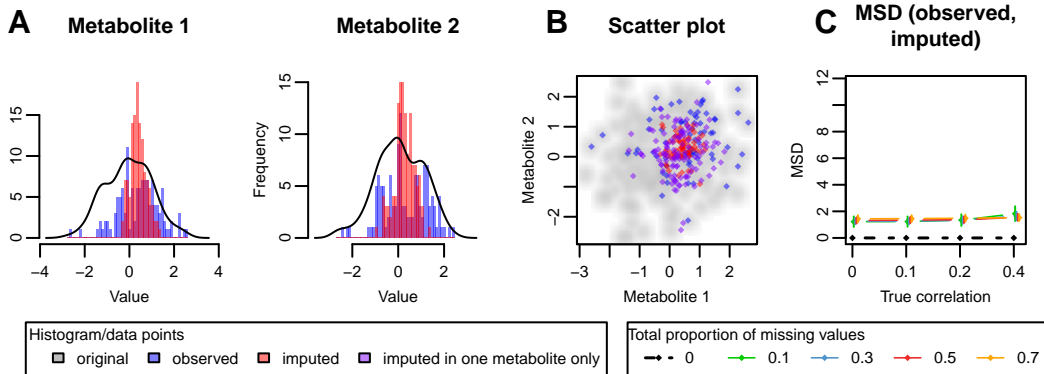


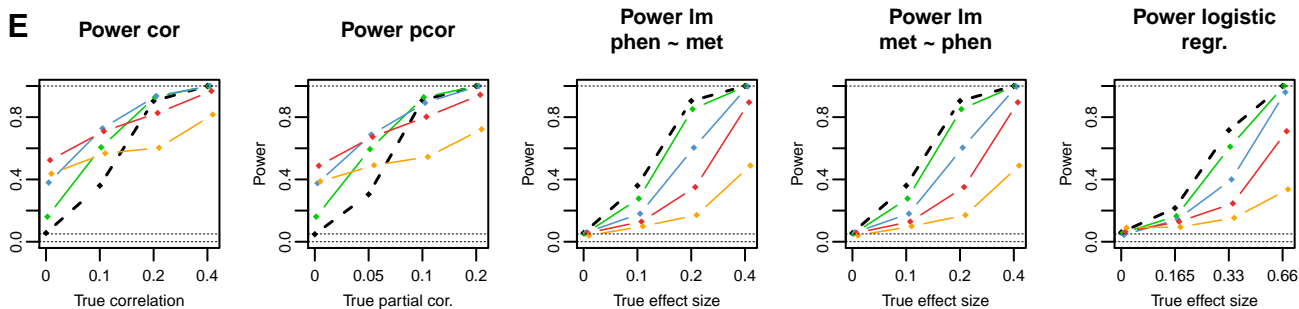
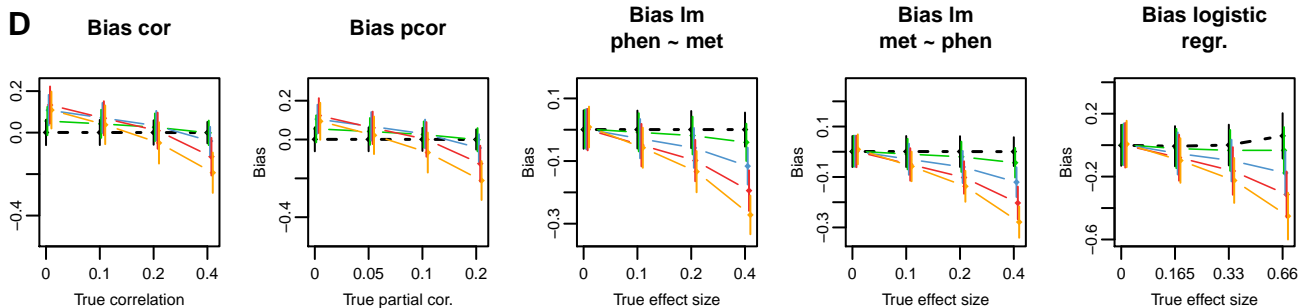
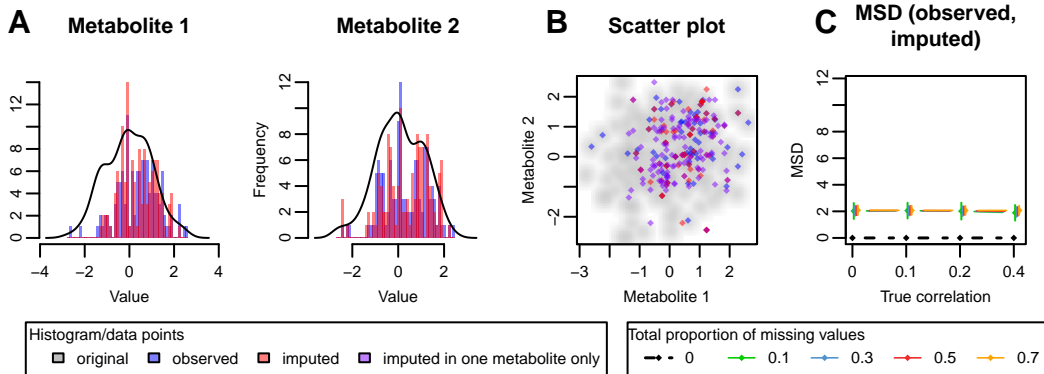


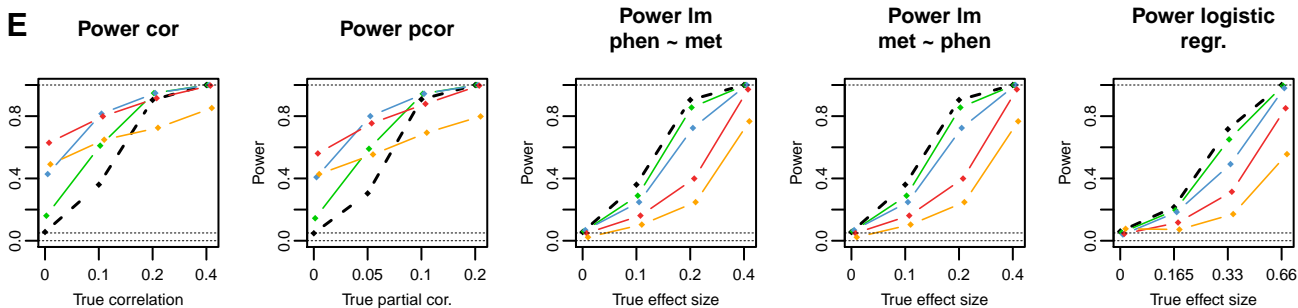
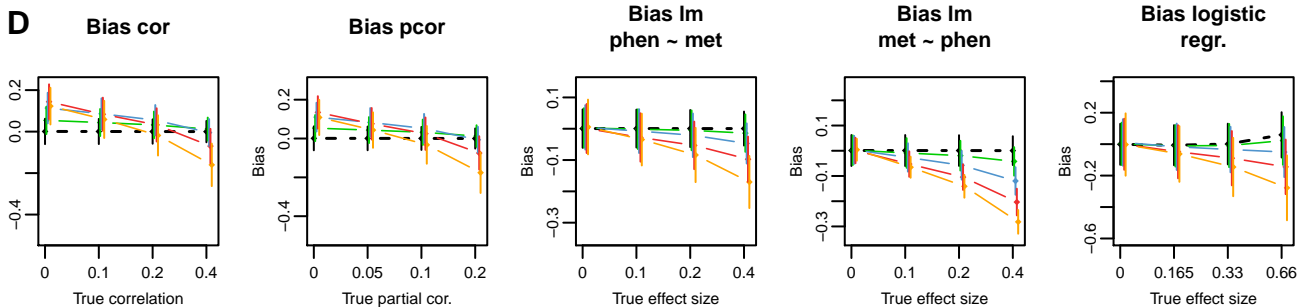
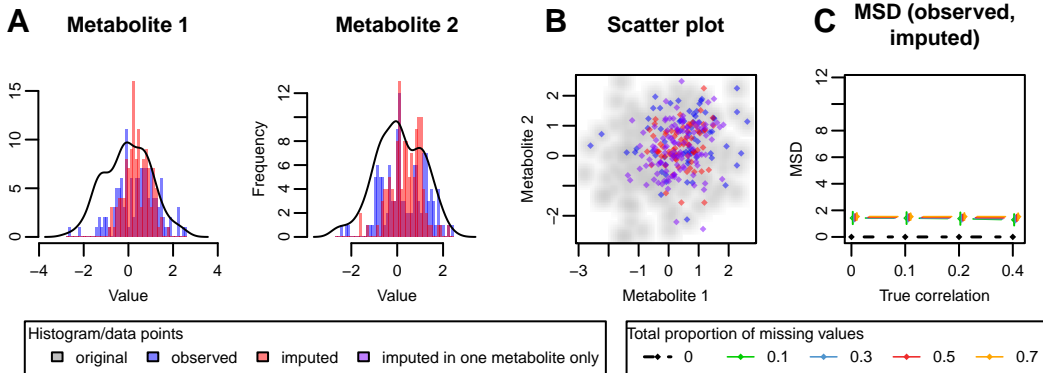


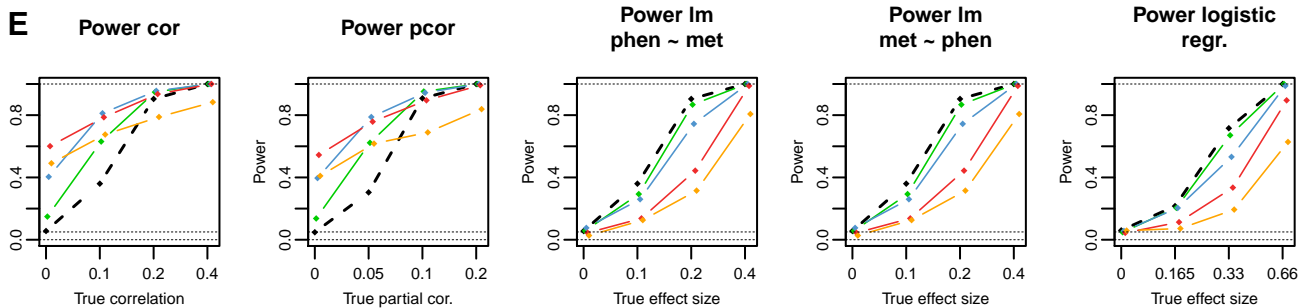
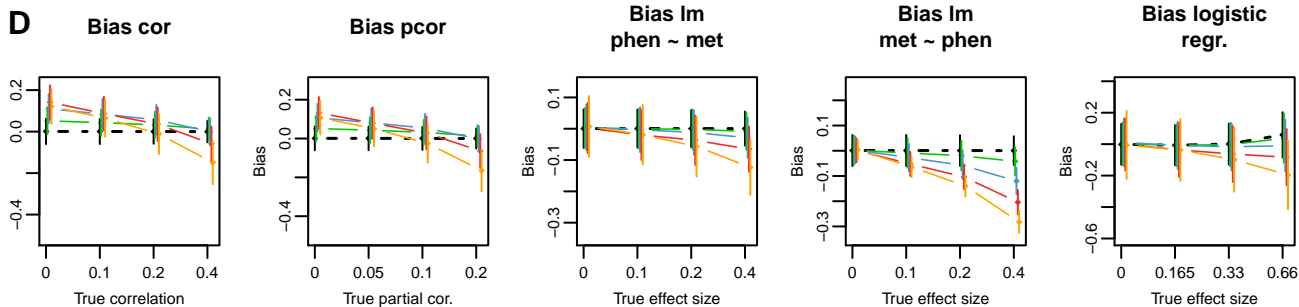
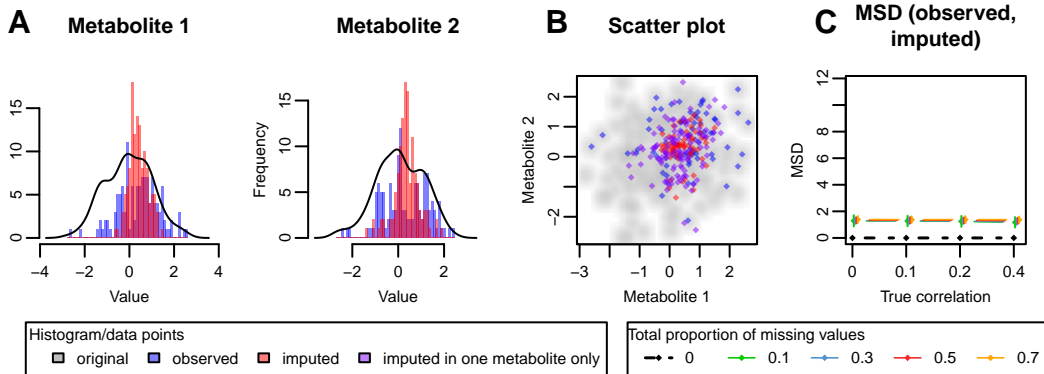


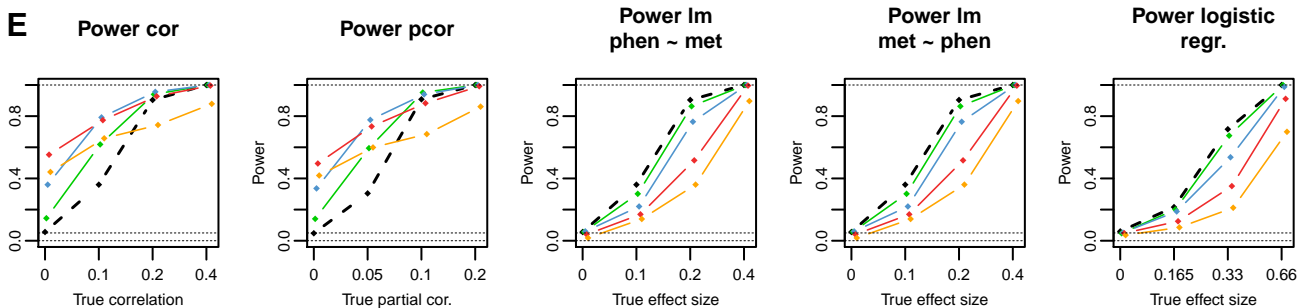
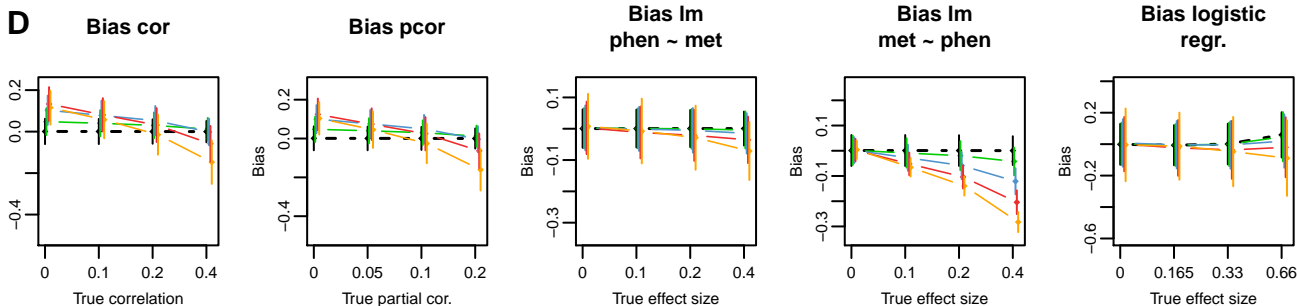
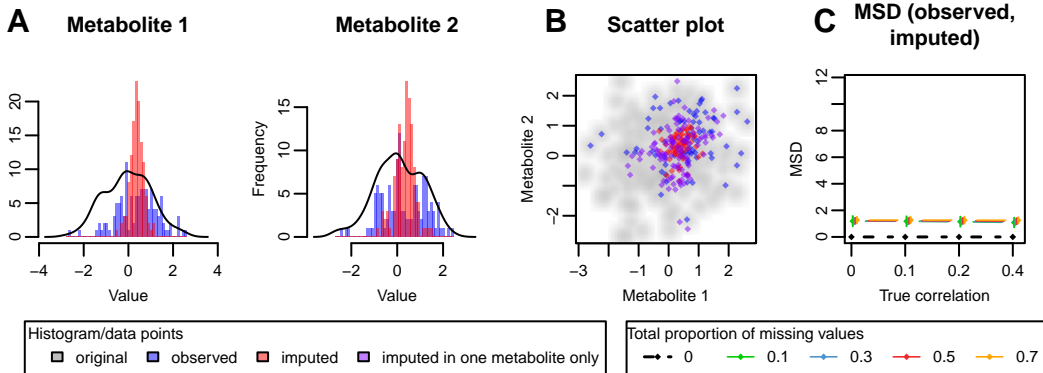


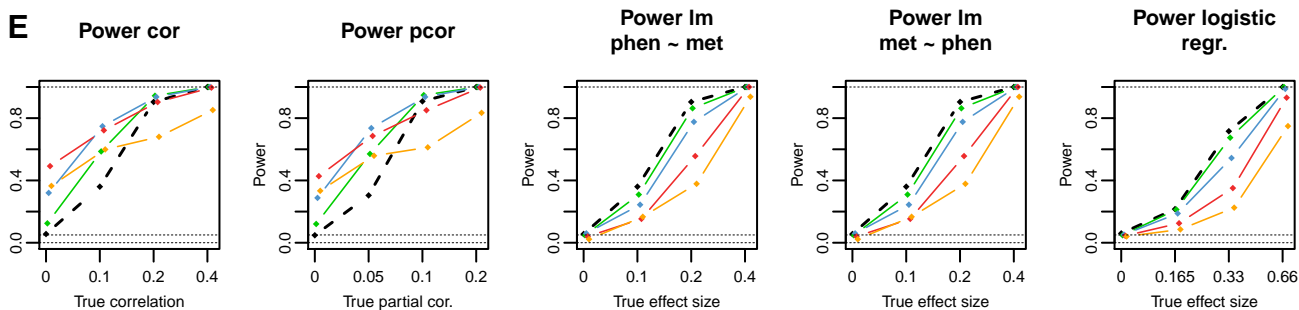
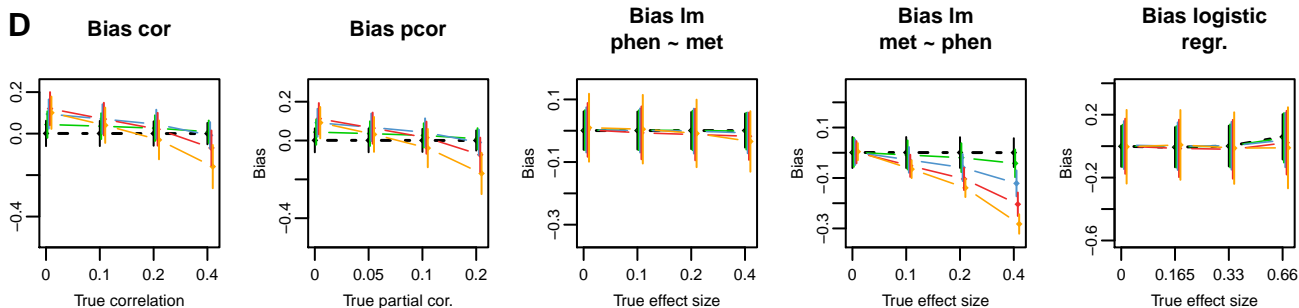
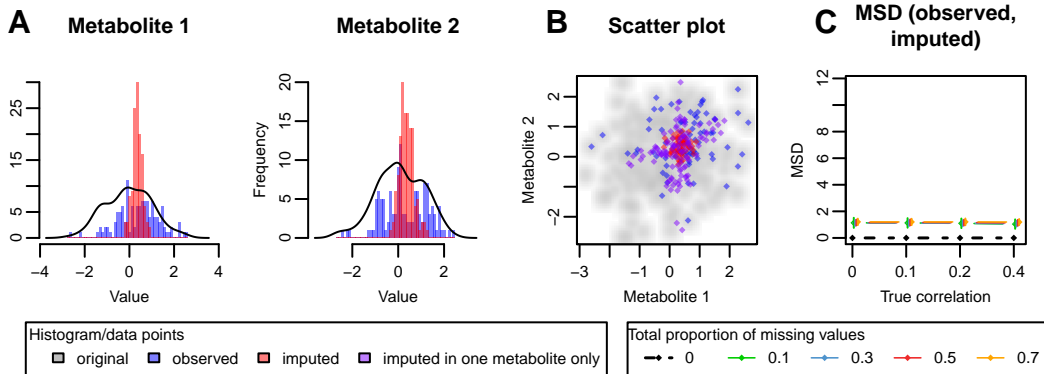


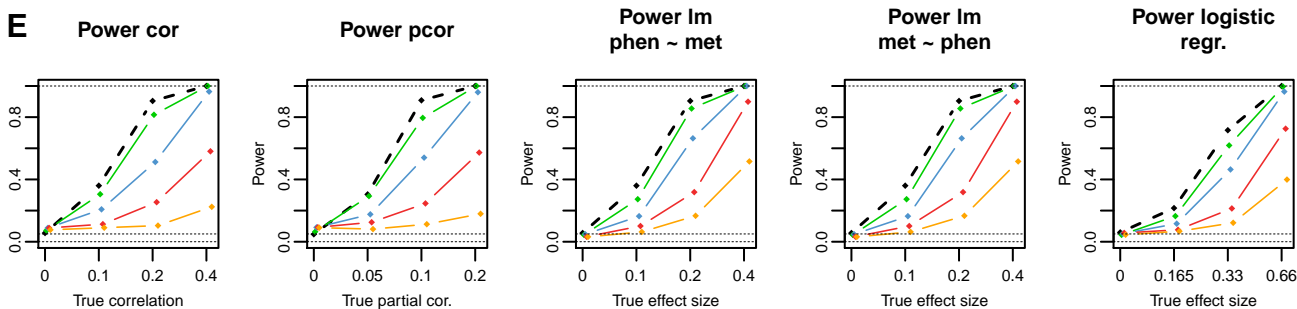
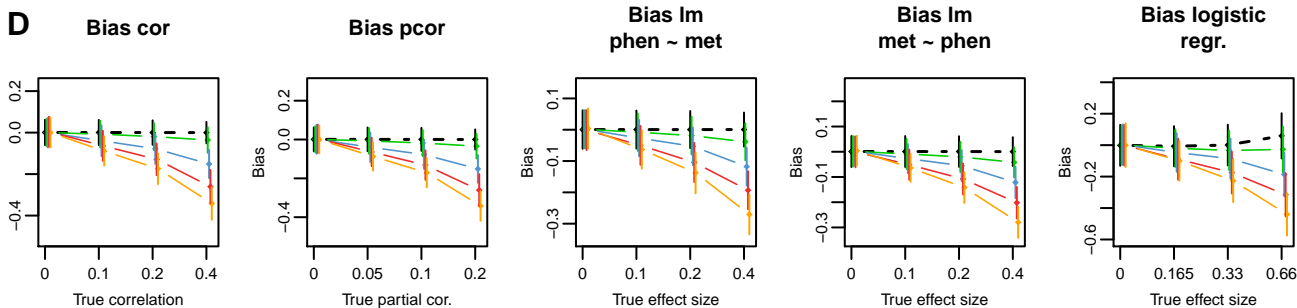
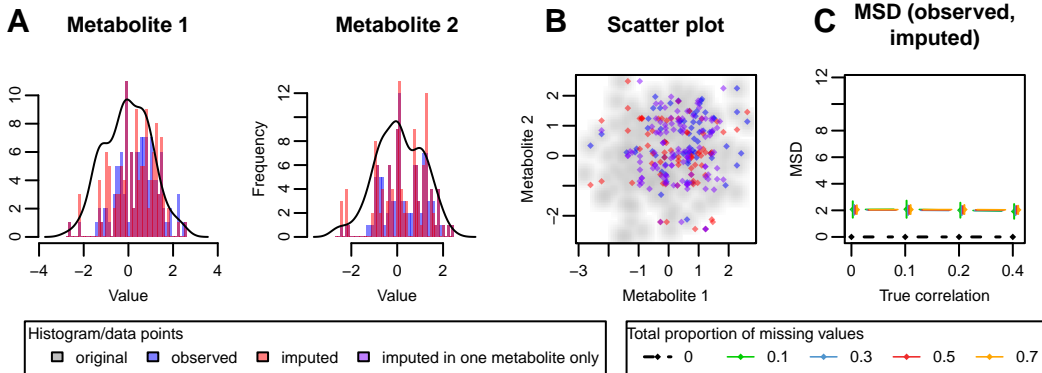


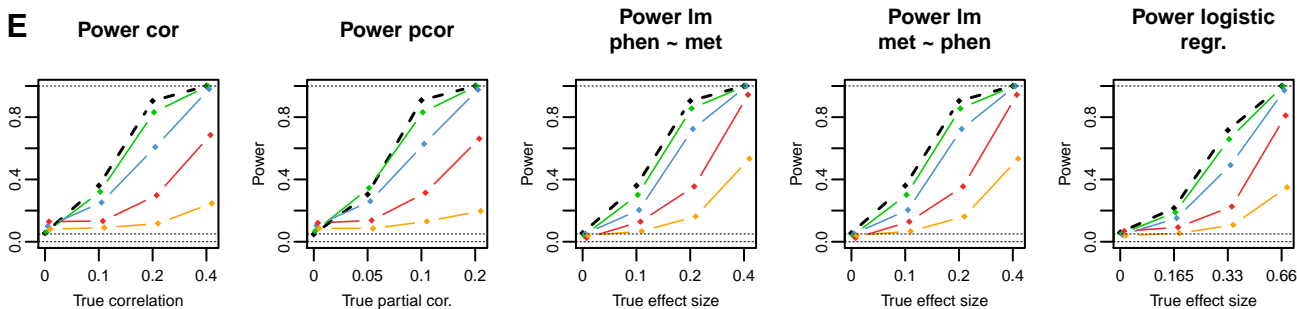
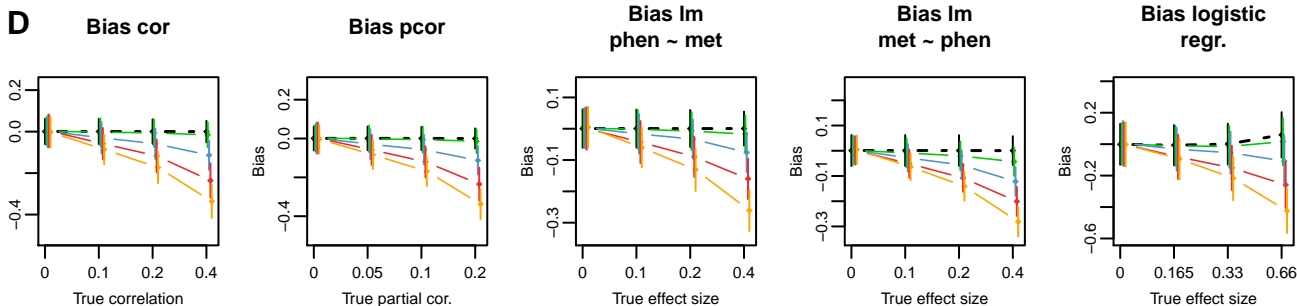
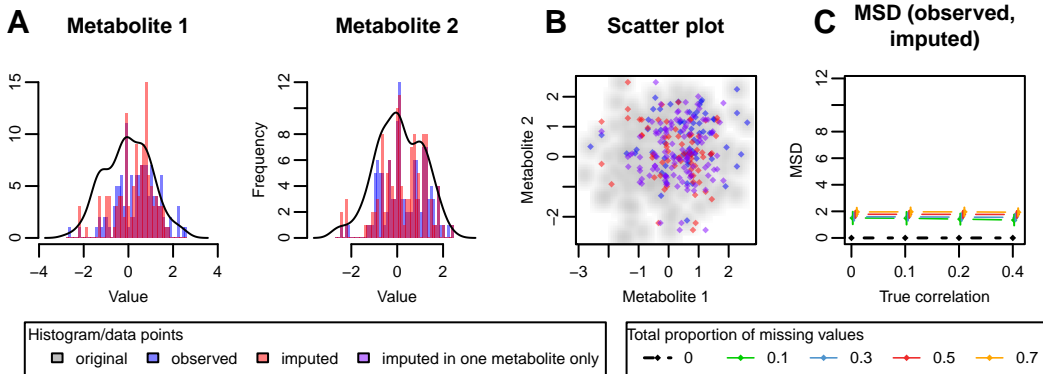


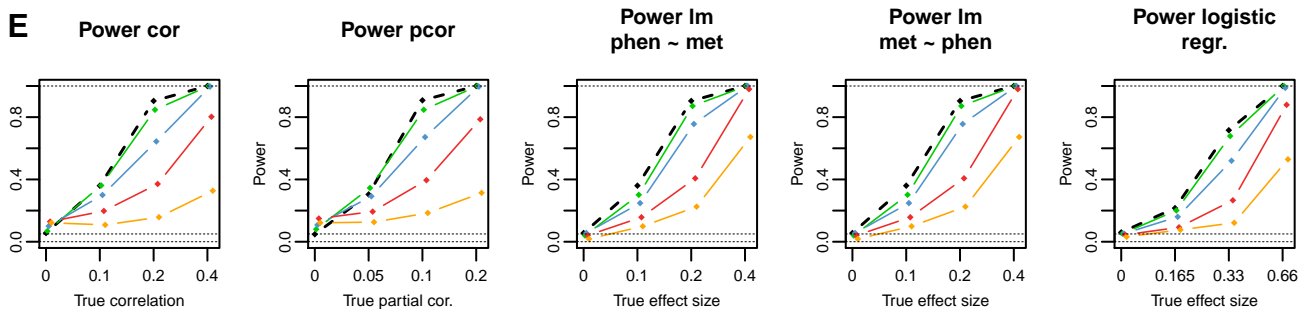
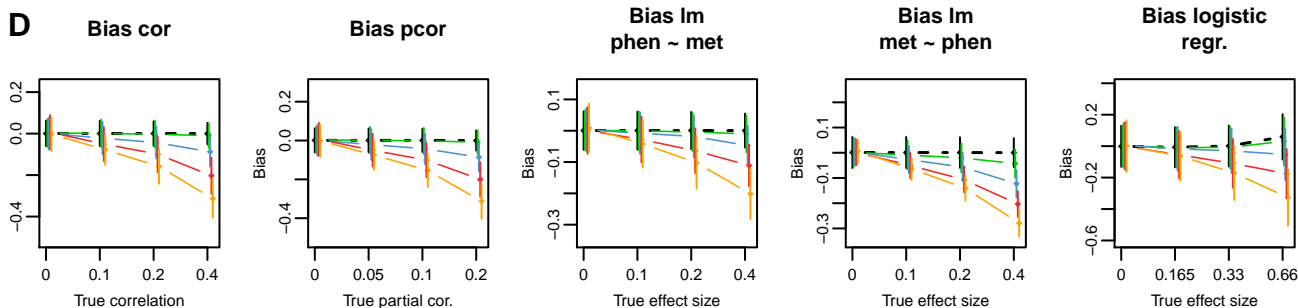
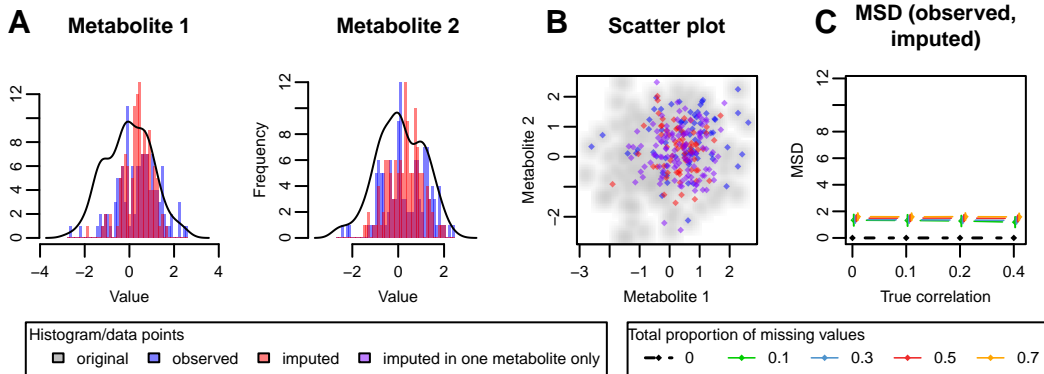


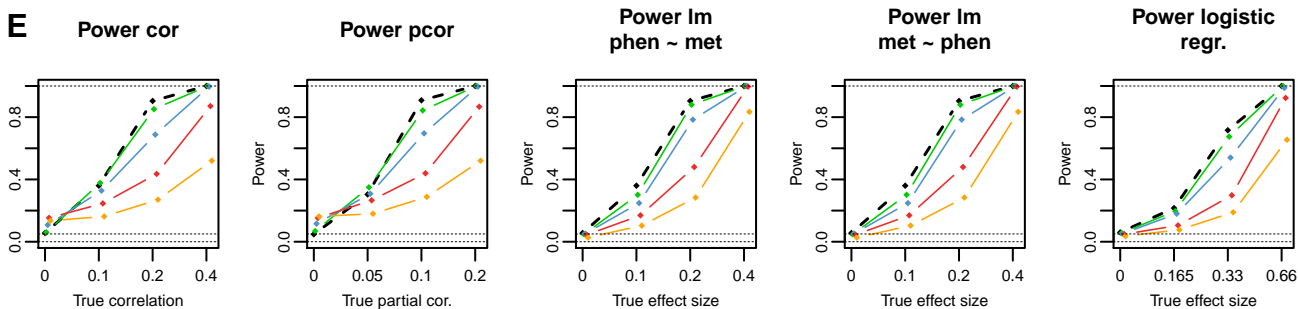
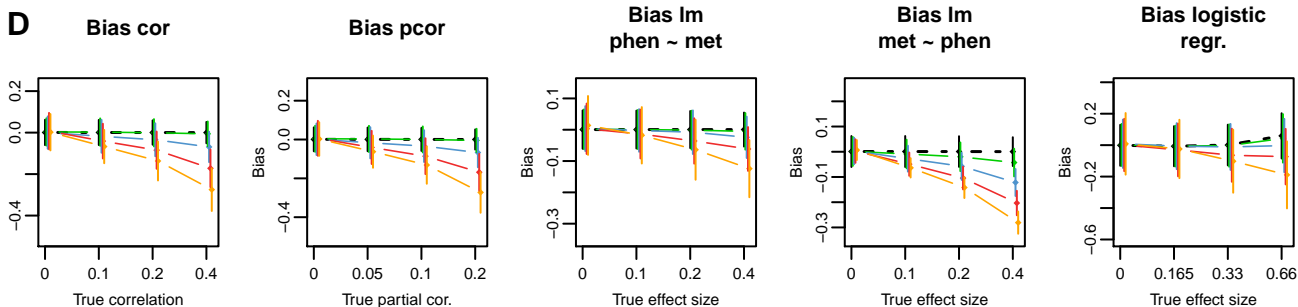
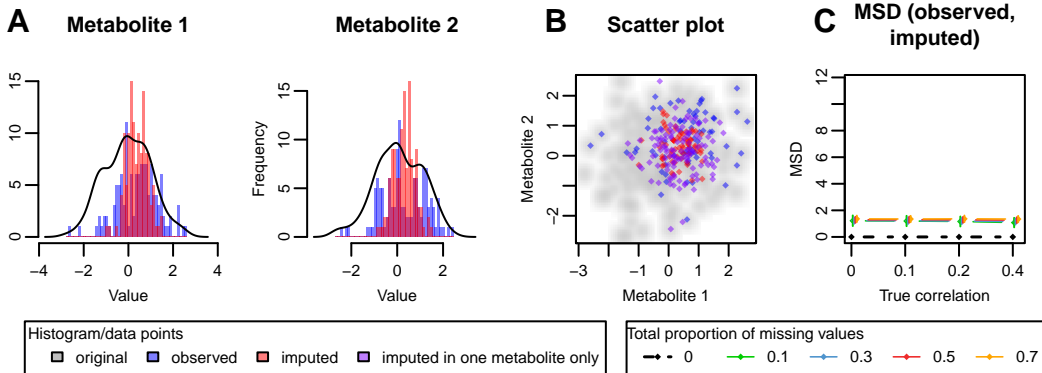


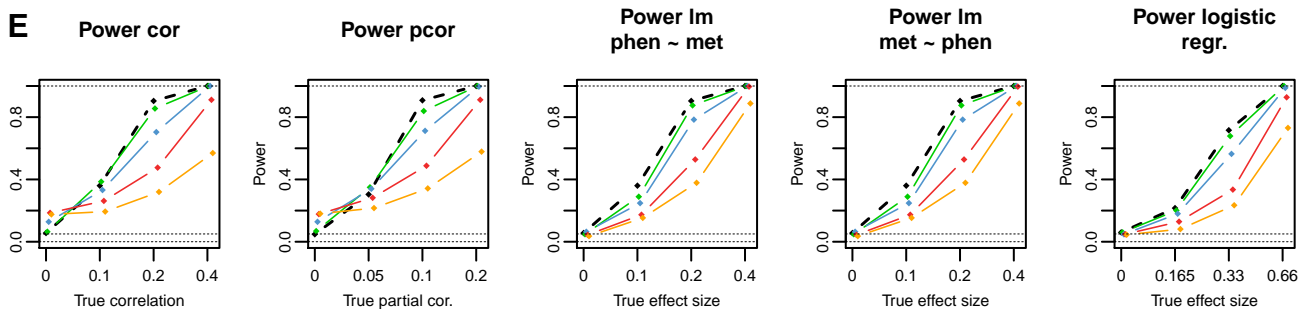
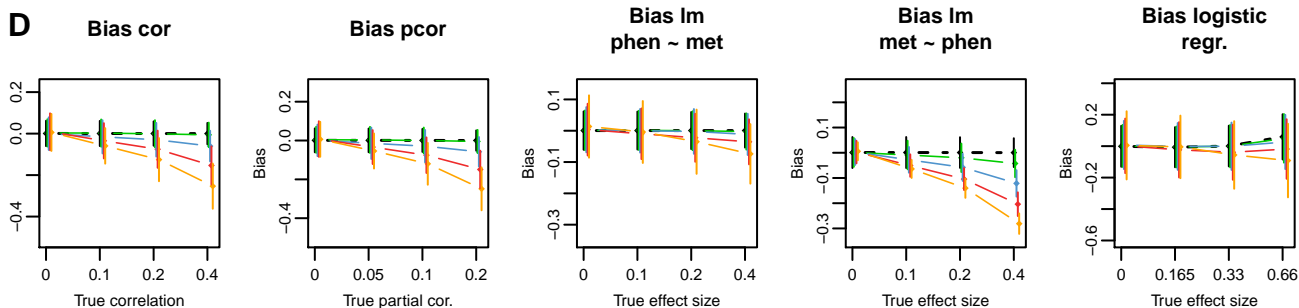
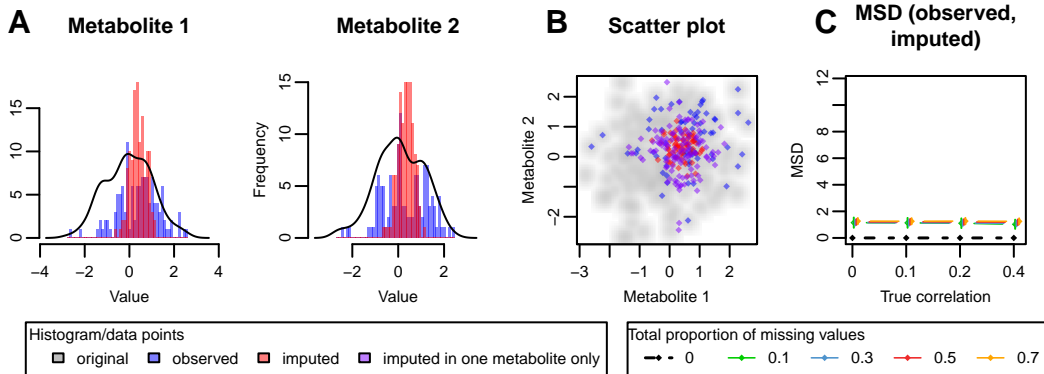


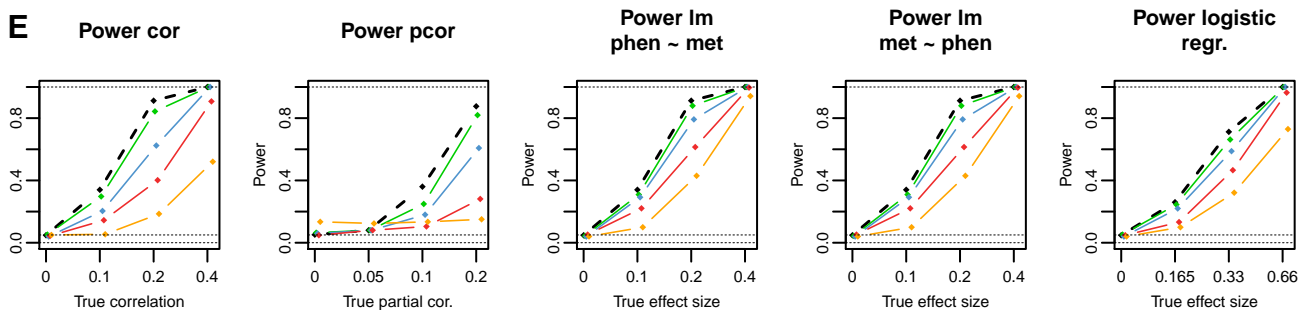
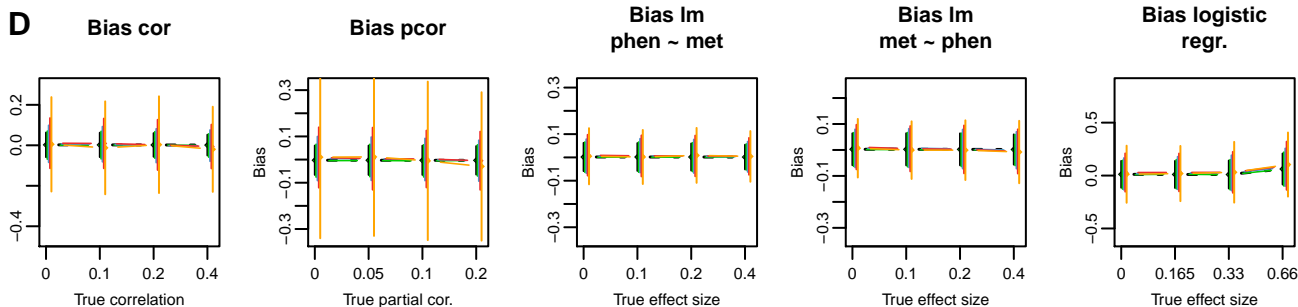
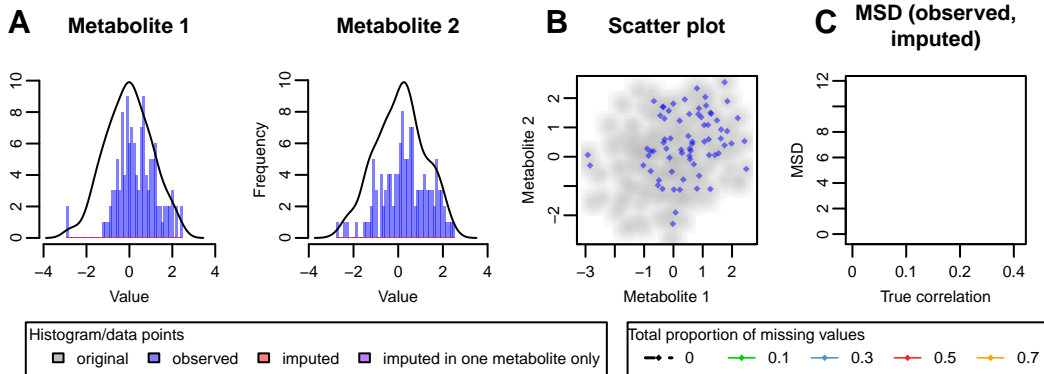


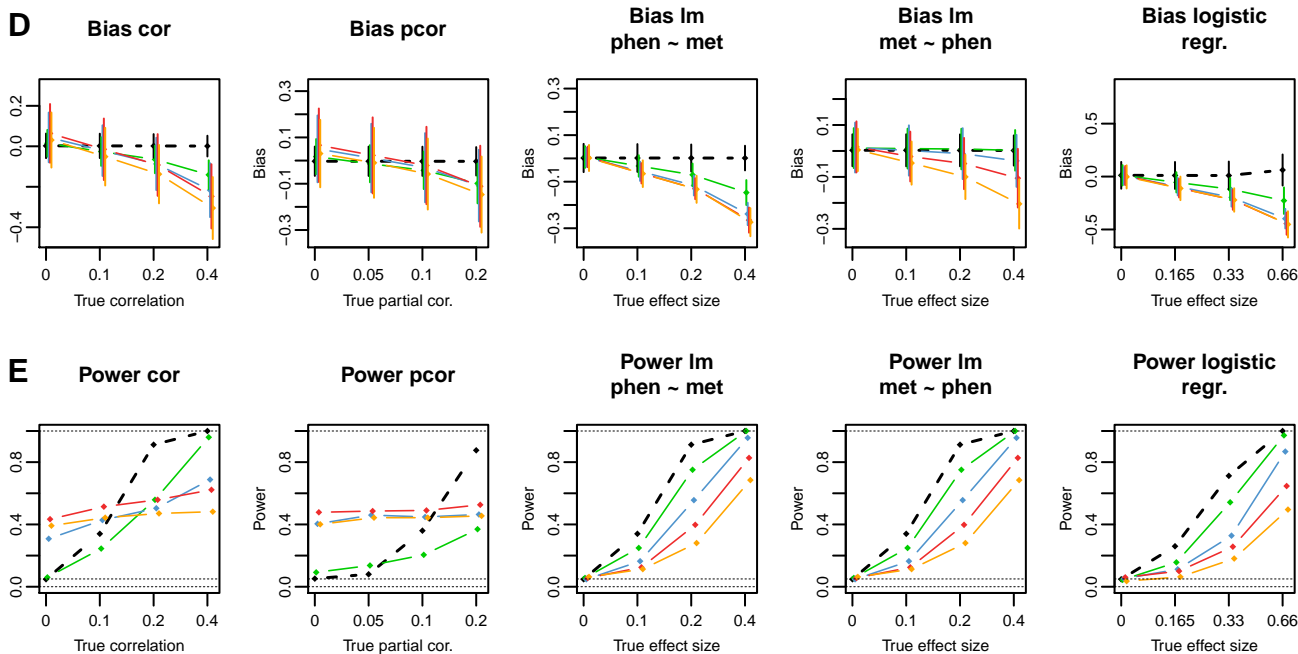
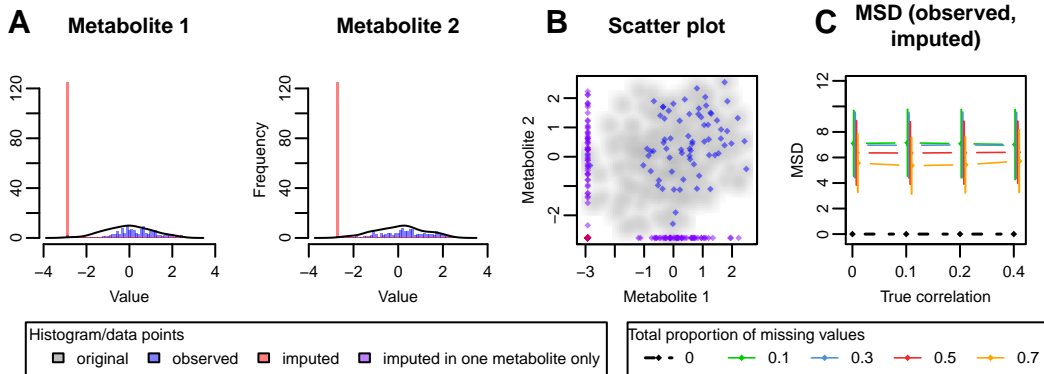


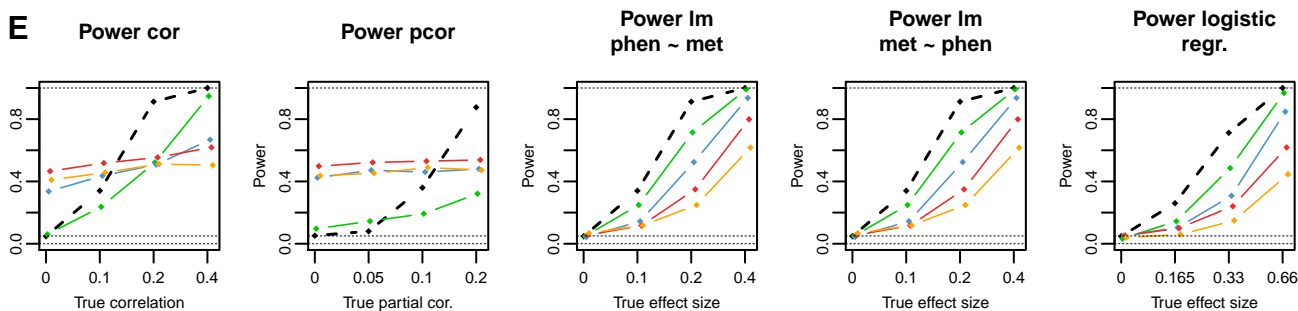
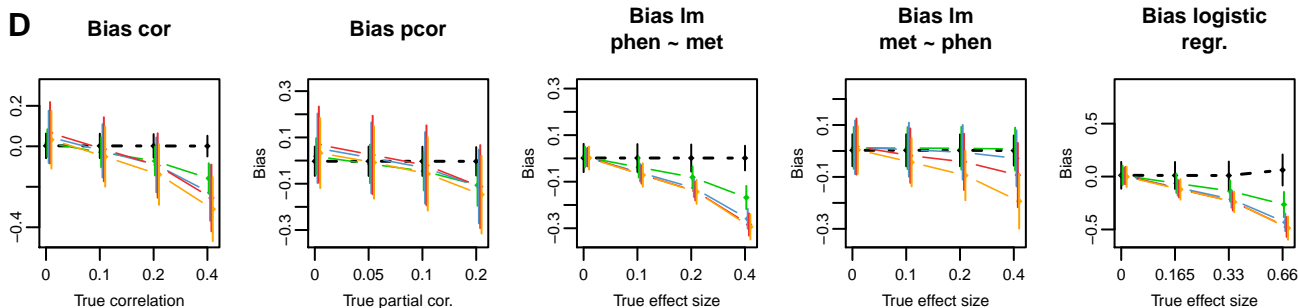
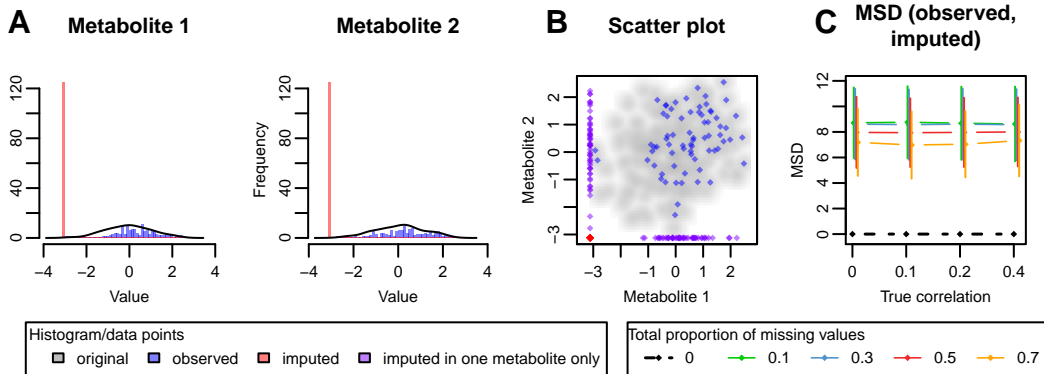


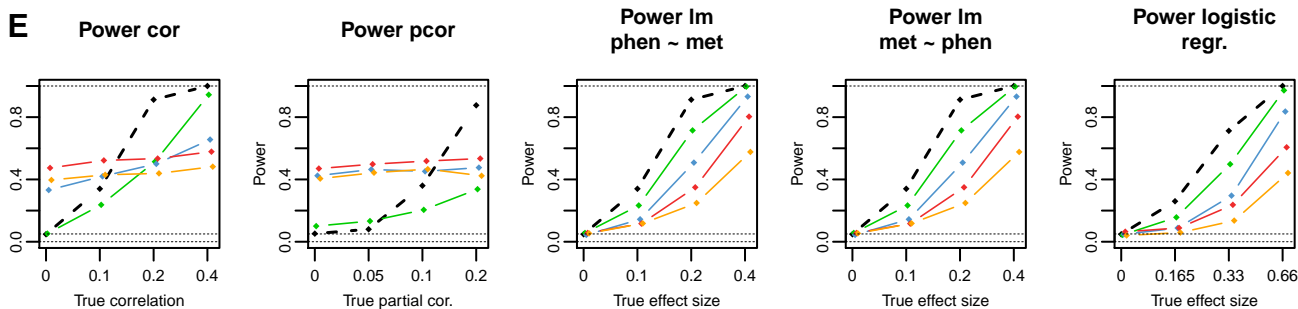
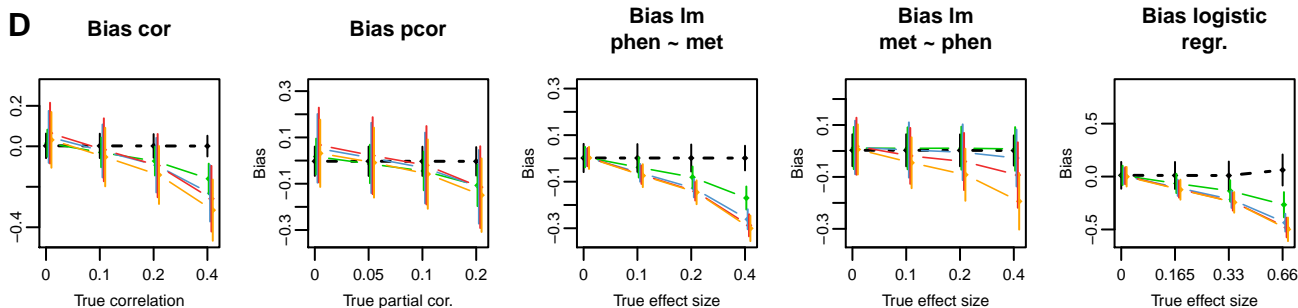
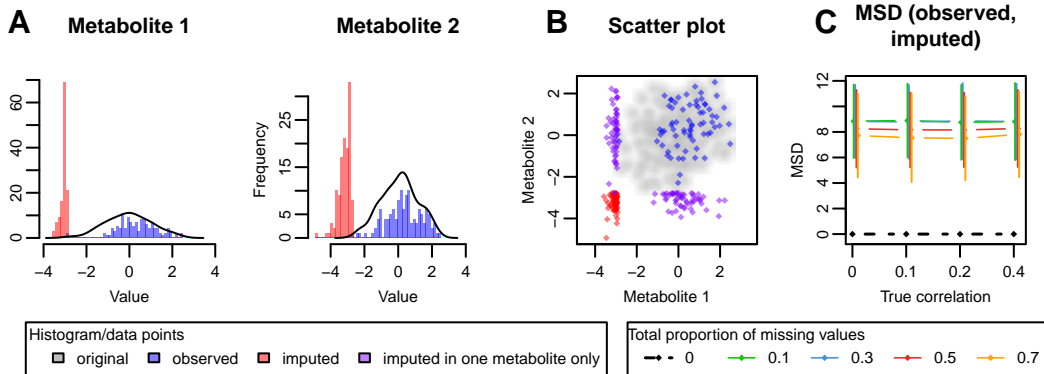


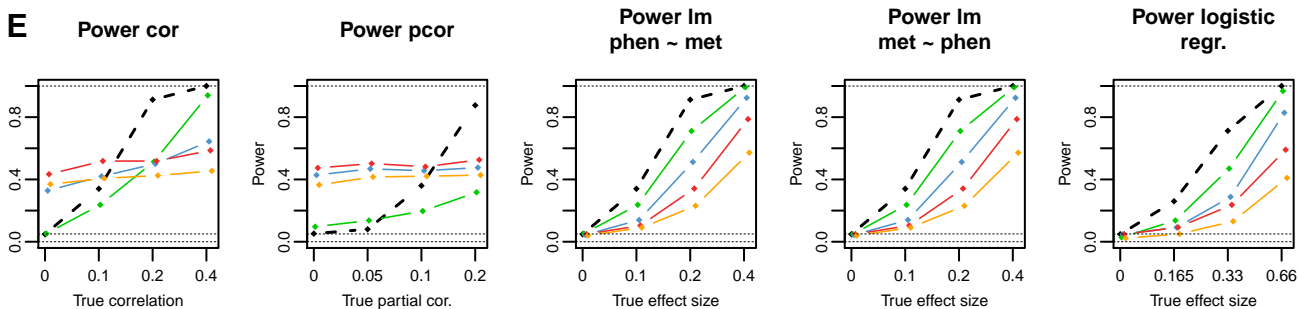
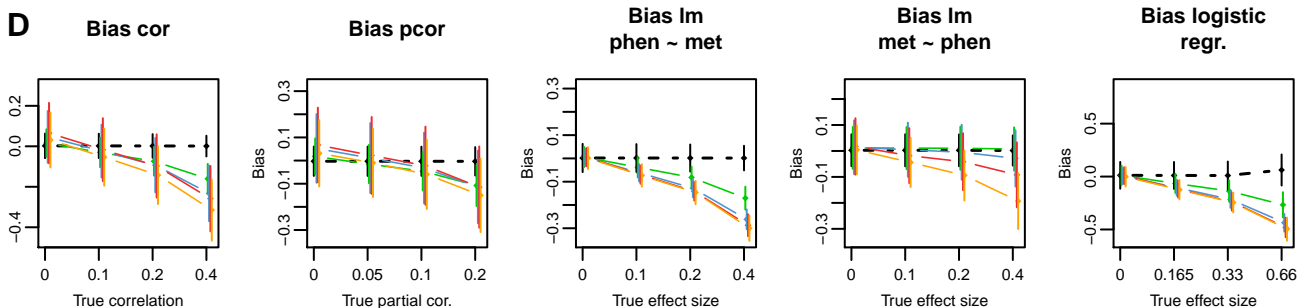
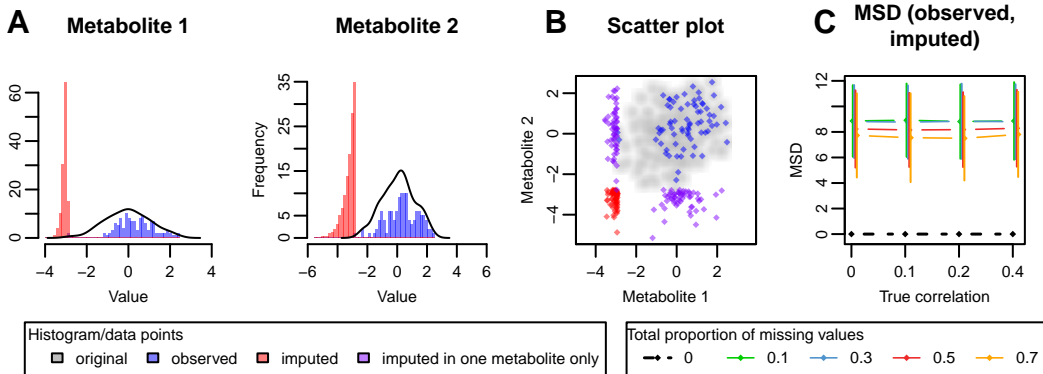


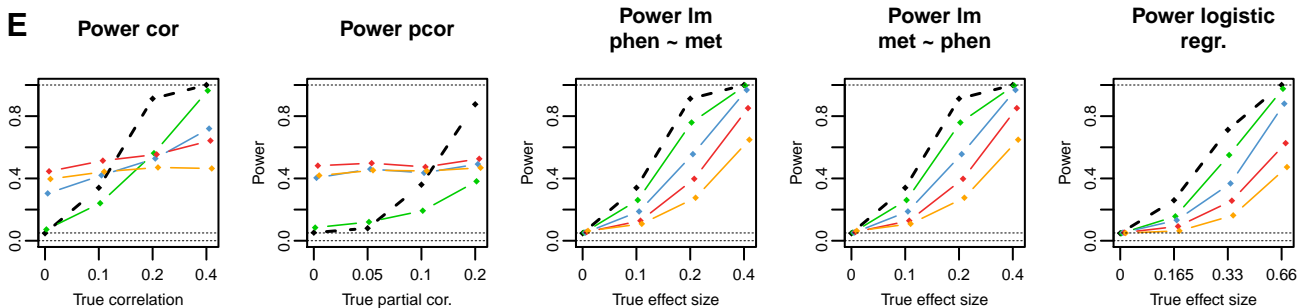
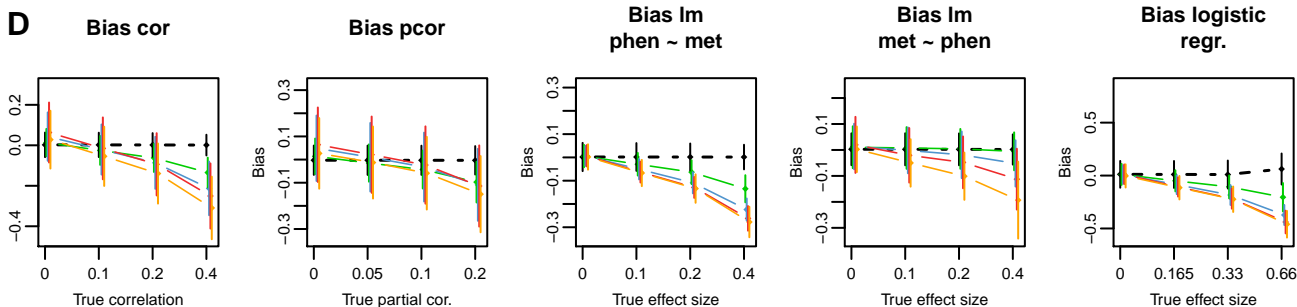
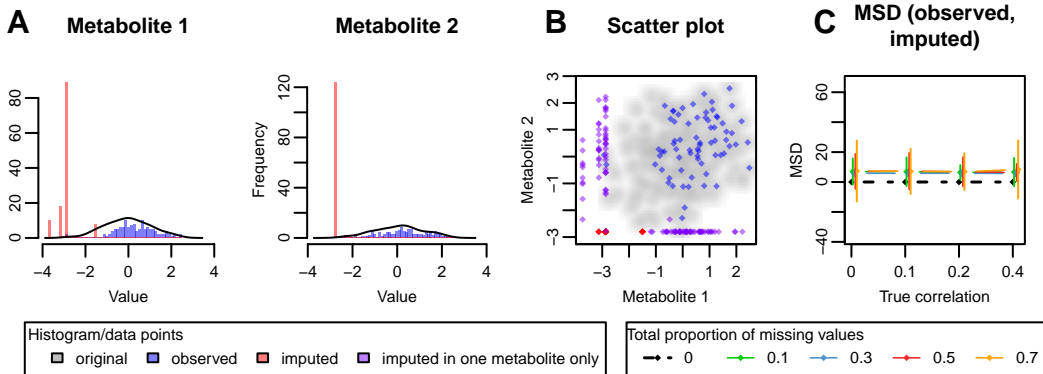


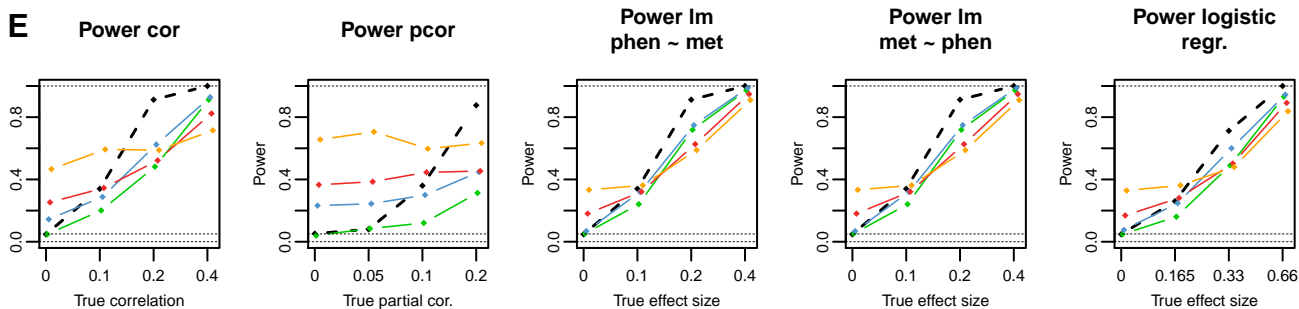
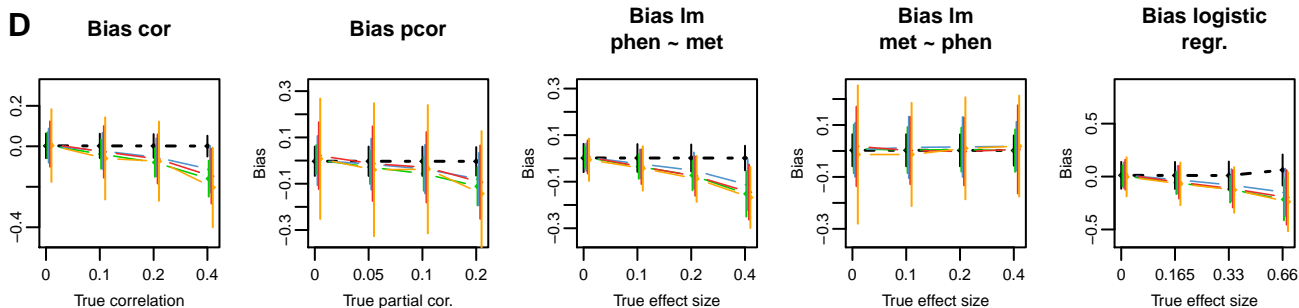
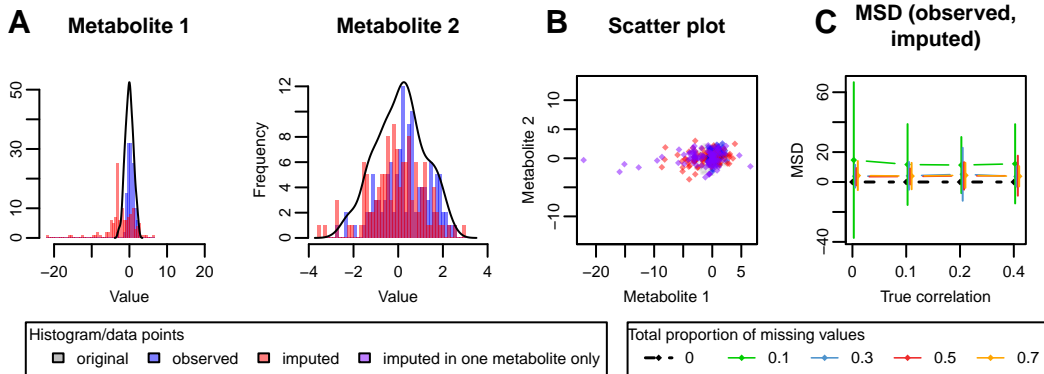


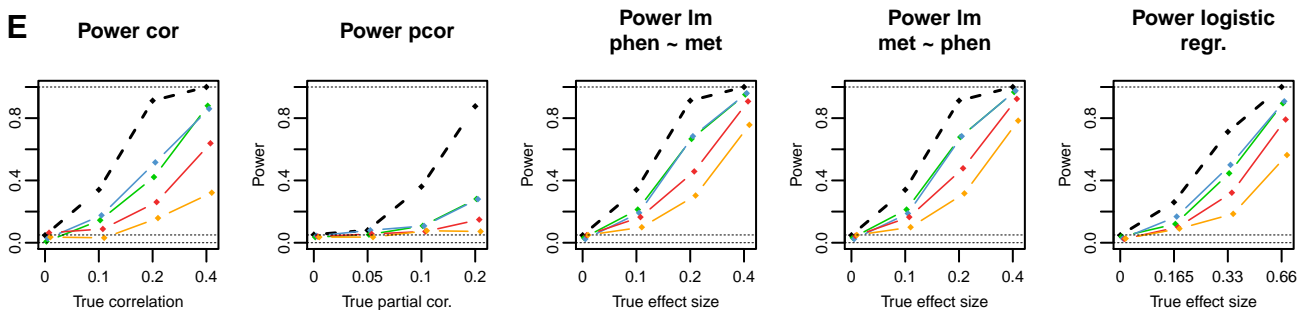
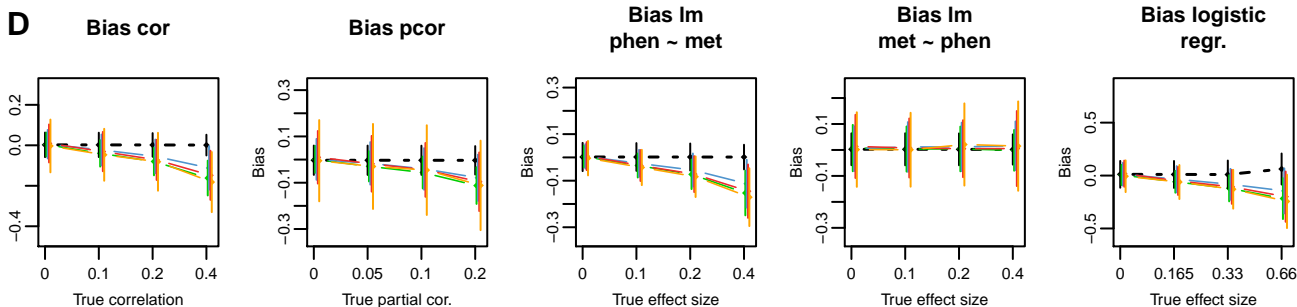
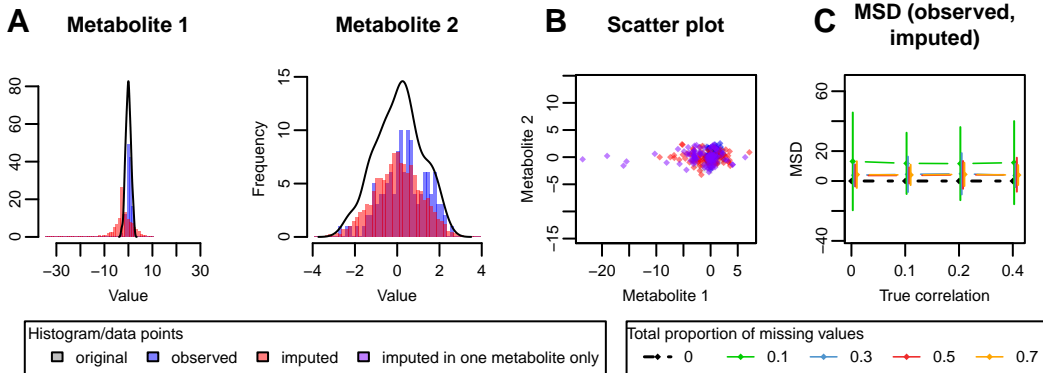




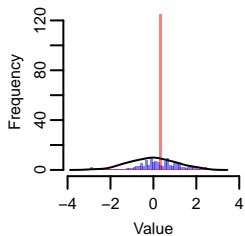




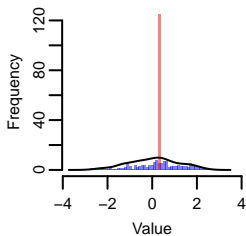




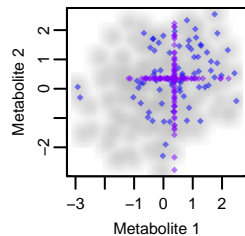
A Metabolite 1



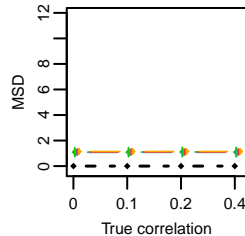
Metabolite 2



B Scatter plot



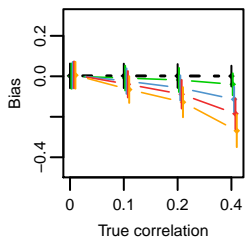
C MSD (observed, imputed)



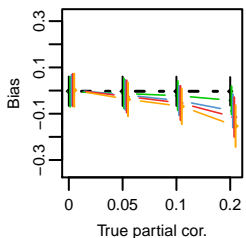
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 - - 0 - - 0.1 - - 0.3 - - 0.5 - - 0.7

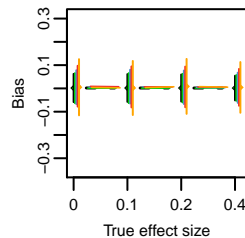
D Bias cor



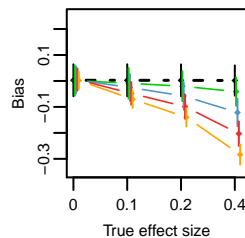
Bias pcor



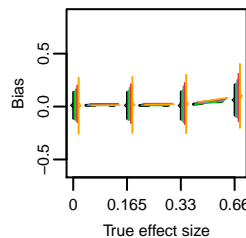
Bias lm phen ~ met



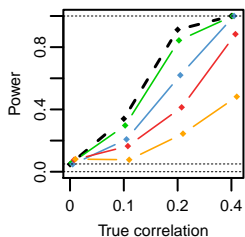
Bias lm met ~ phen



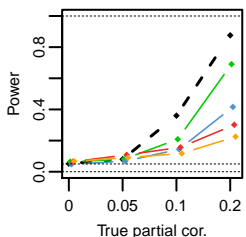
Bias logistic regr.



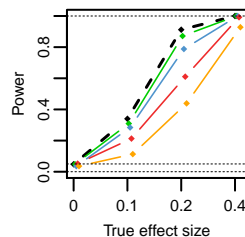
E Power cor



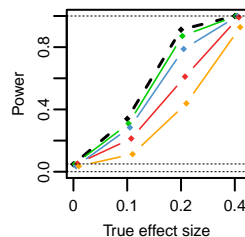
Power pcor



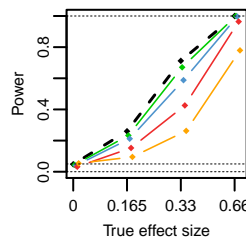
Power lm phen ~ met

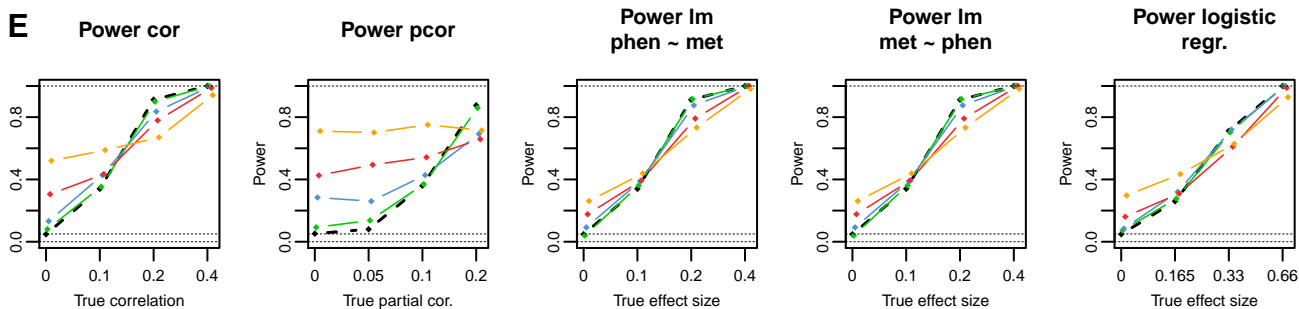
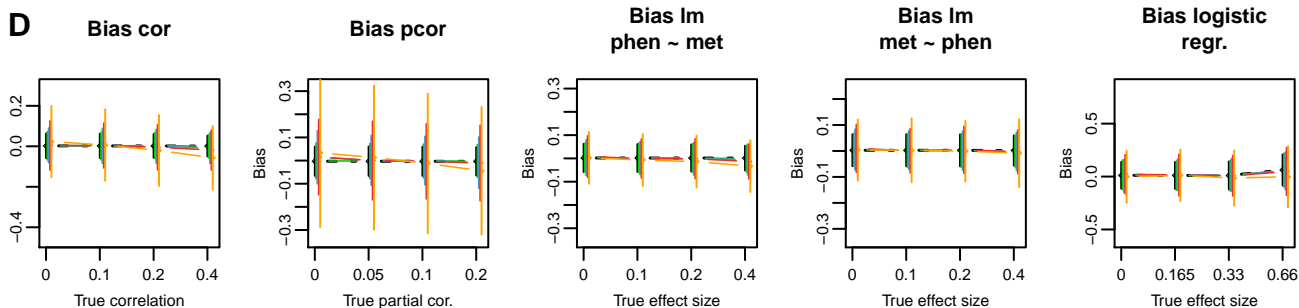
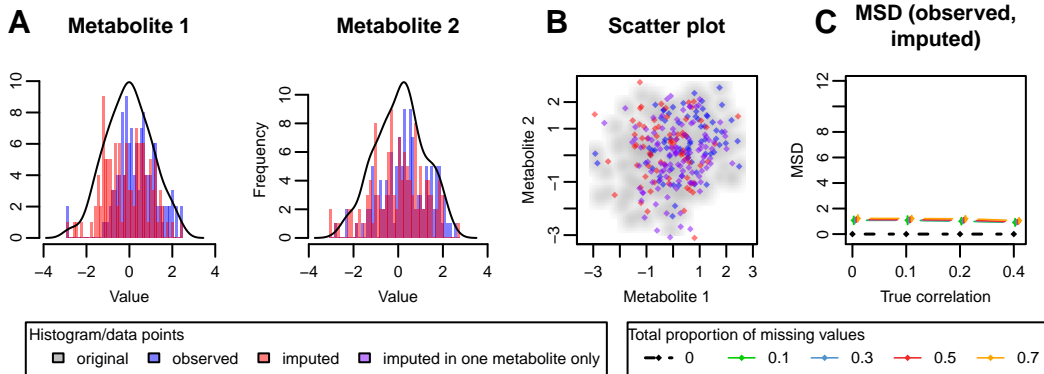


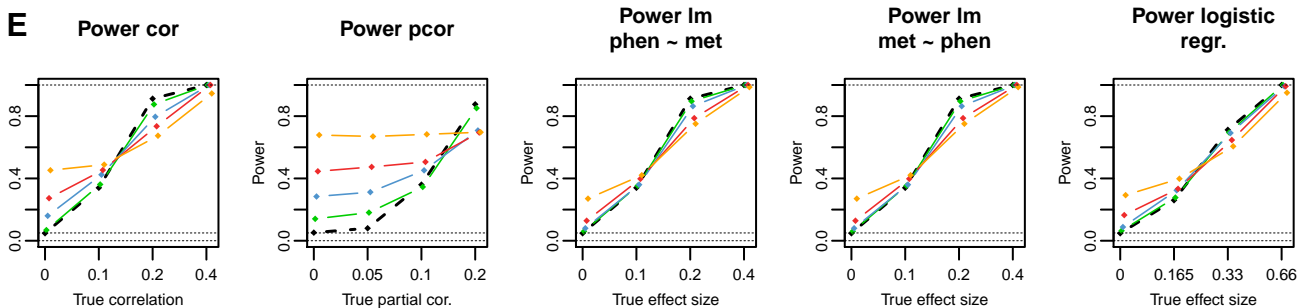
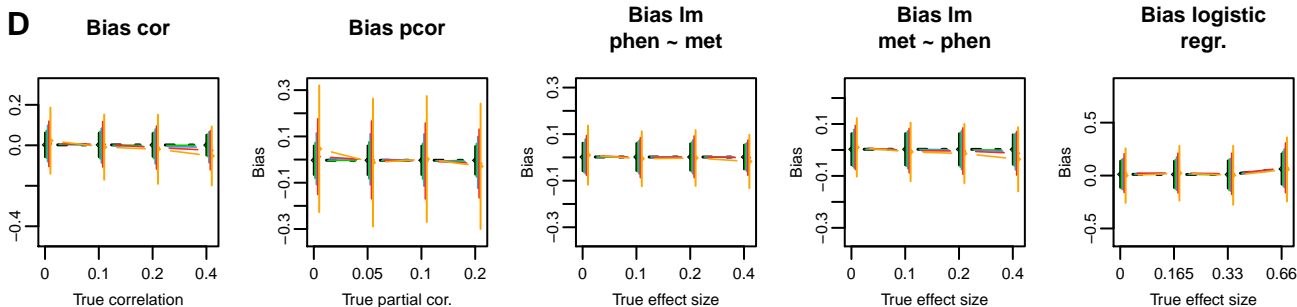
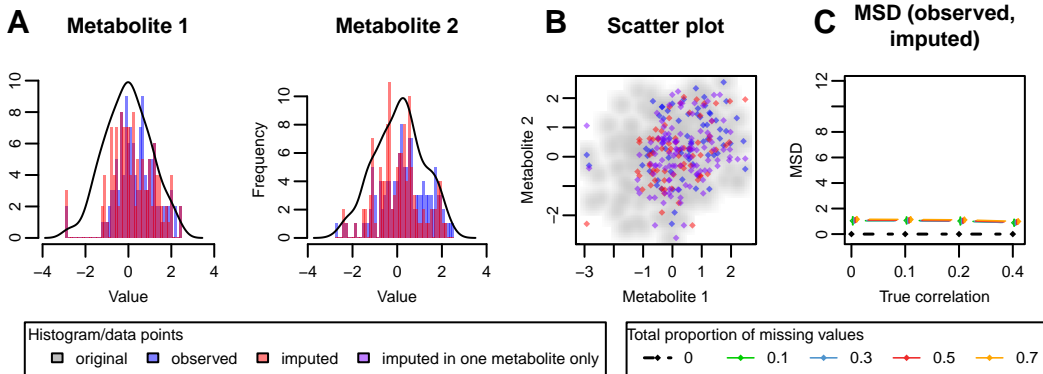
Power lm met ~ phen

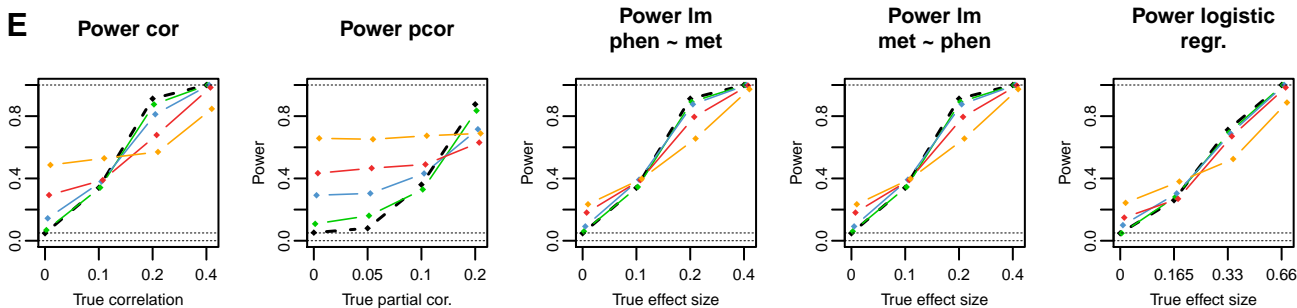
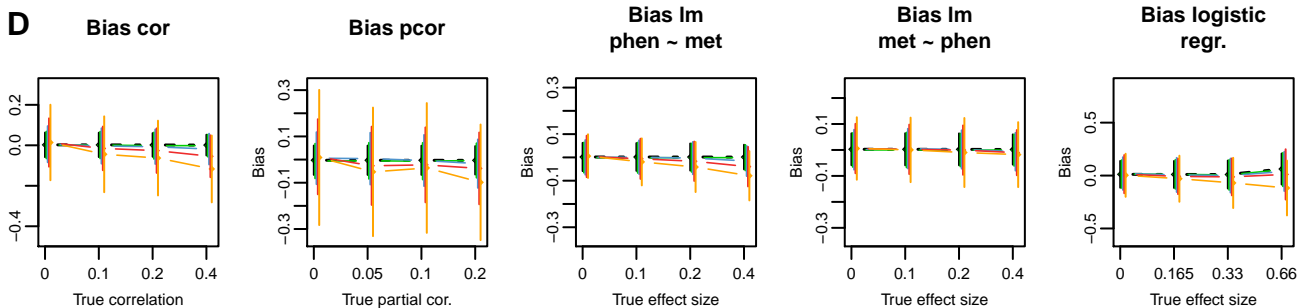
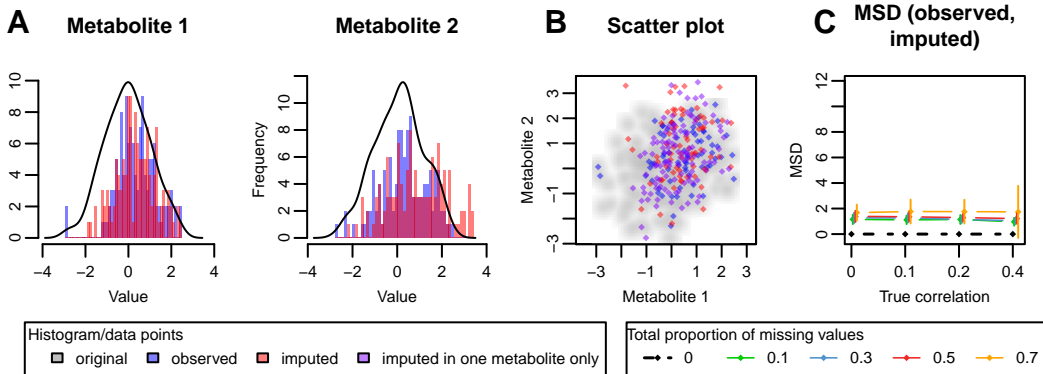


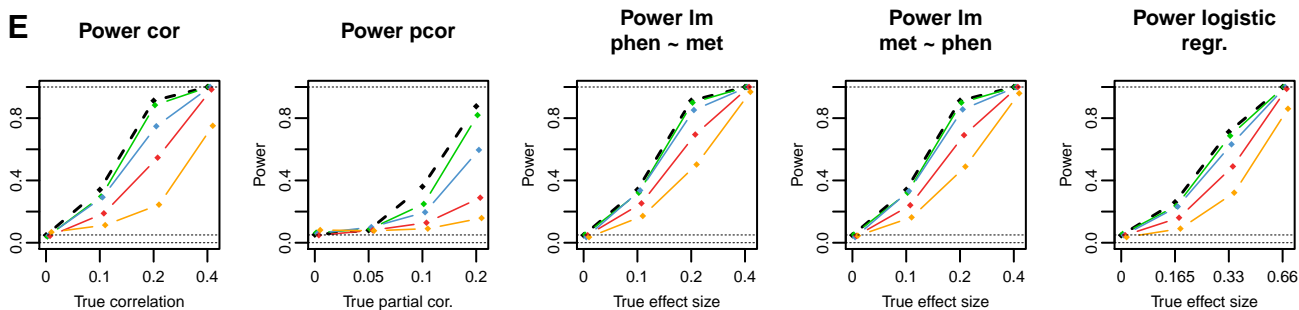
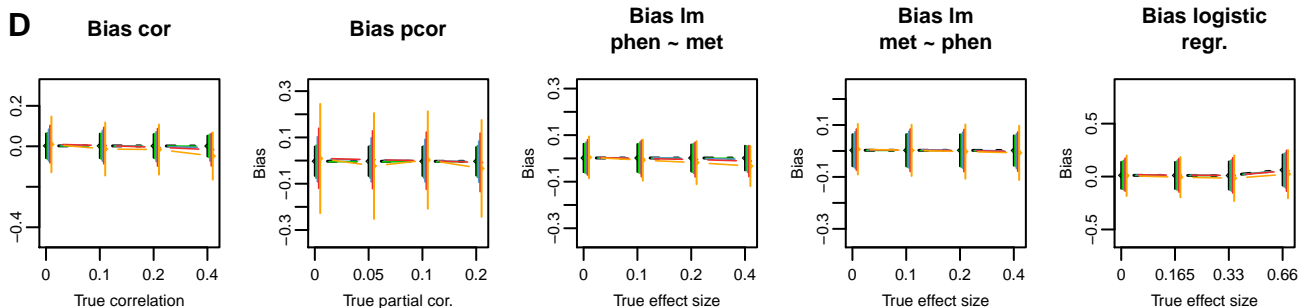
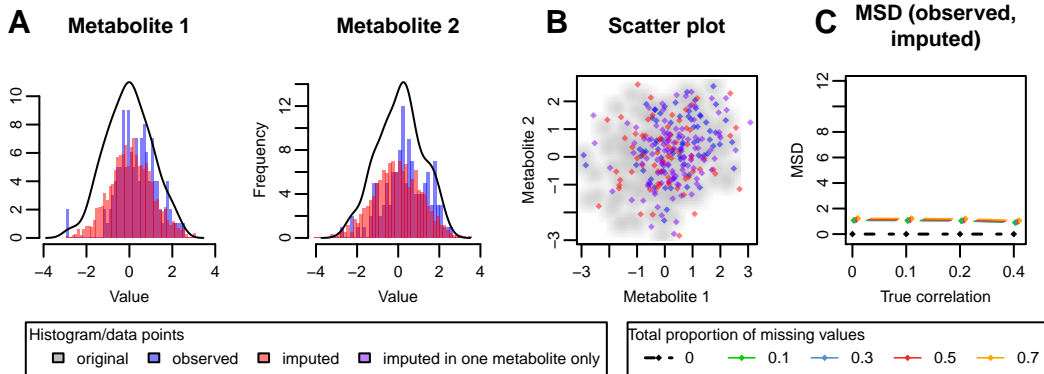
Power logistic regr.

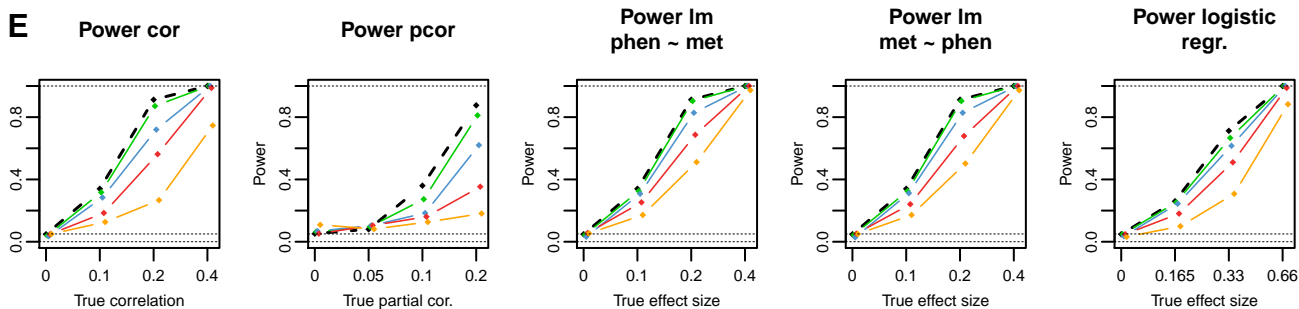
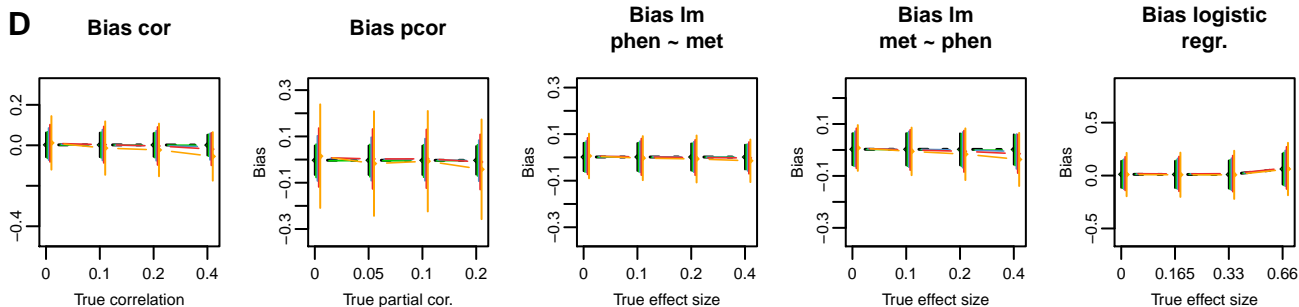
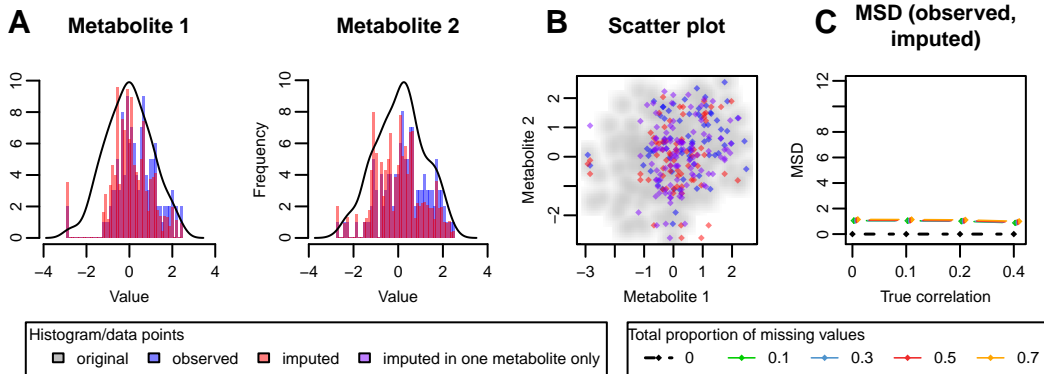


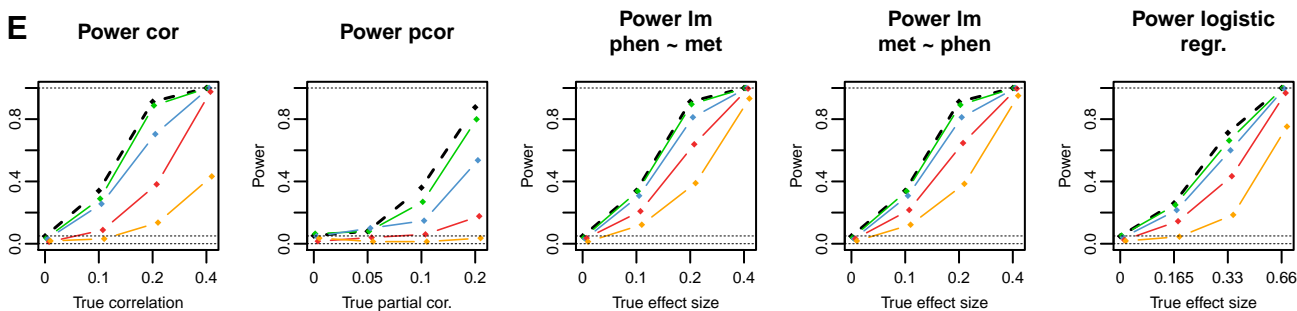
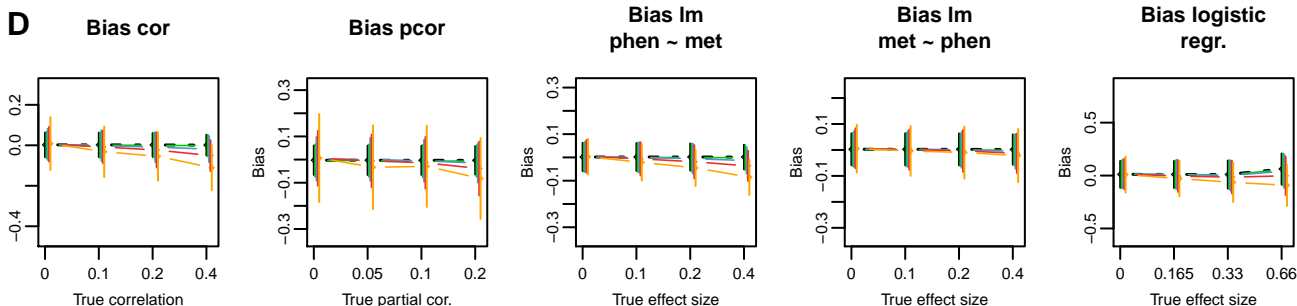
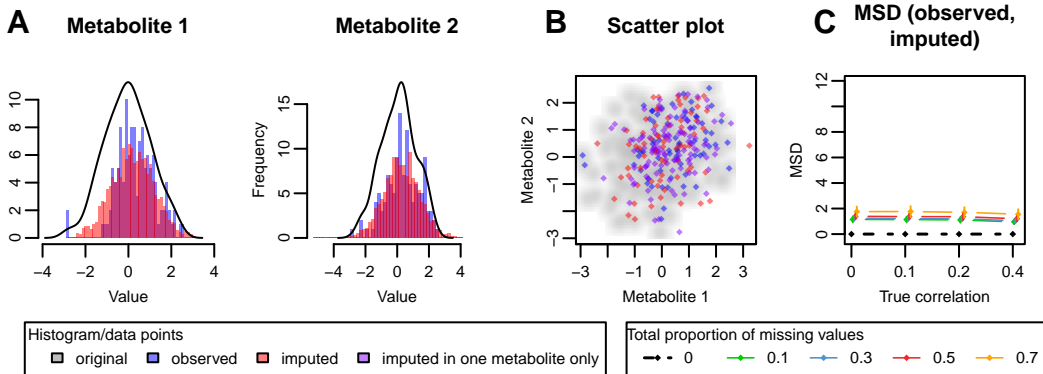


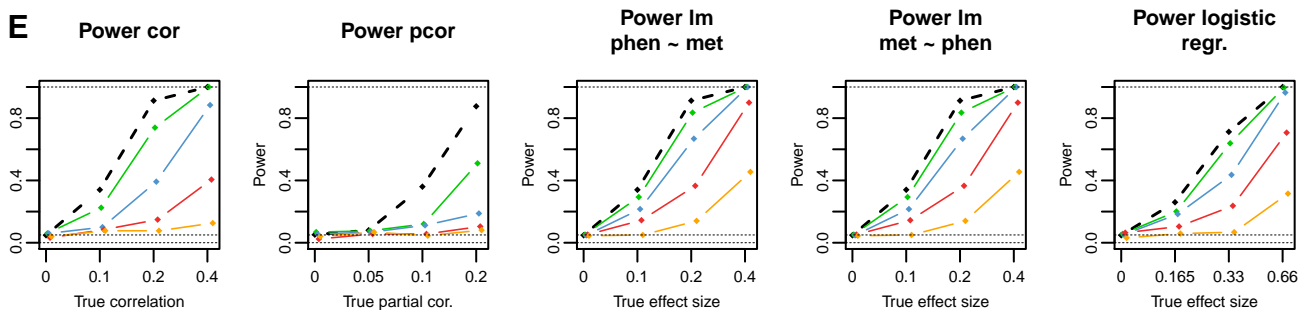
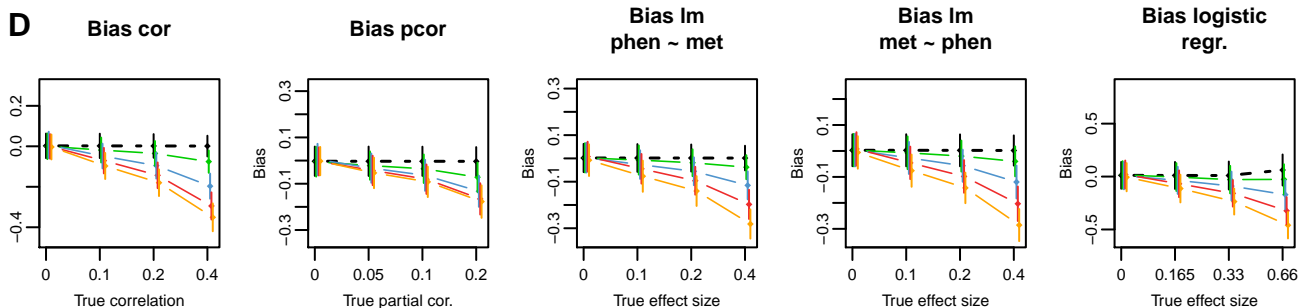
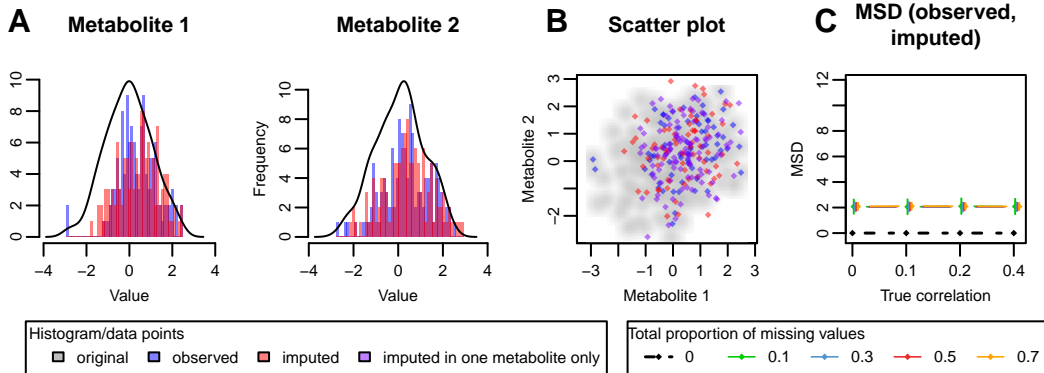


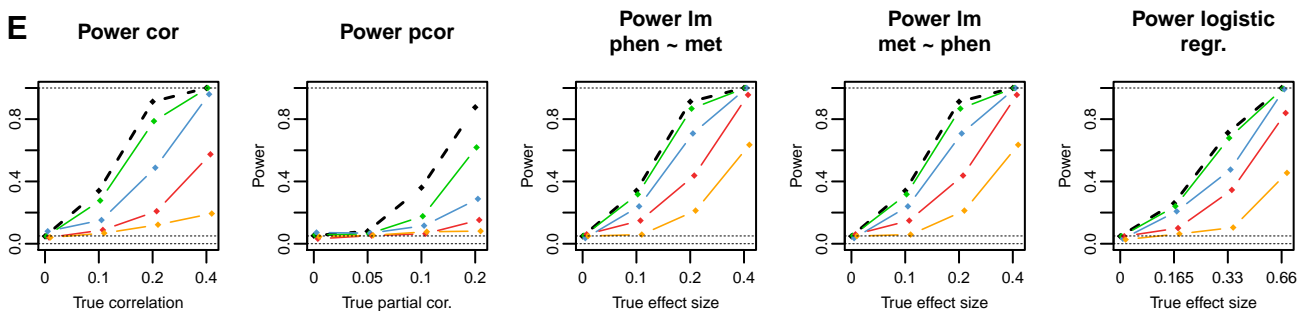
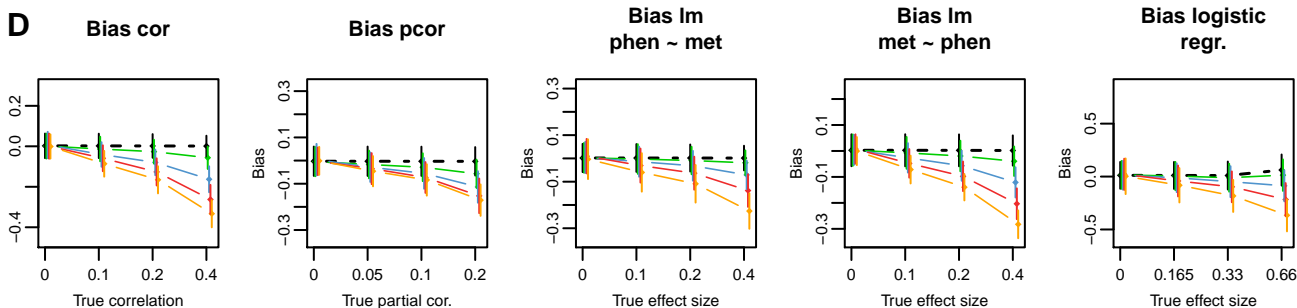
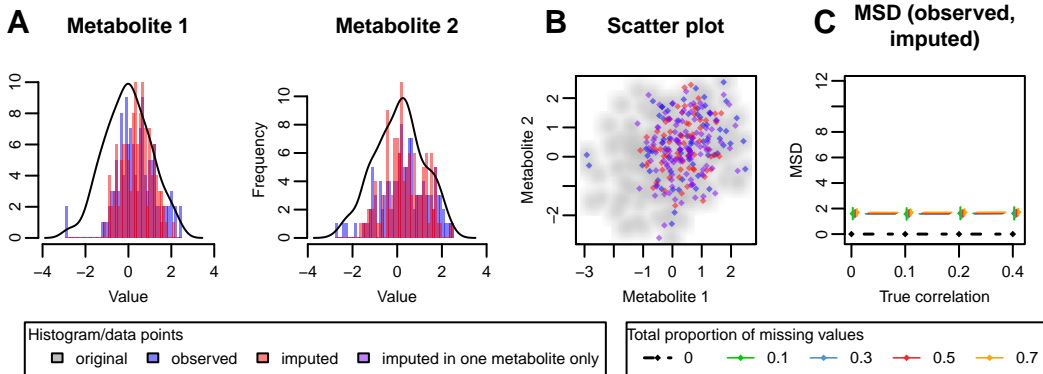


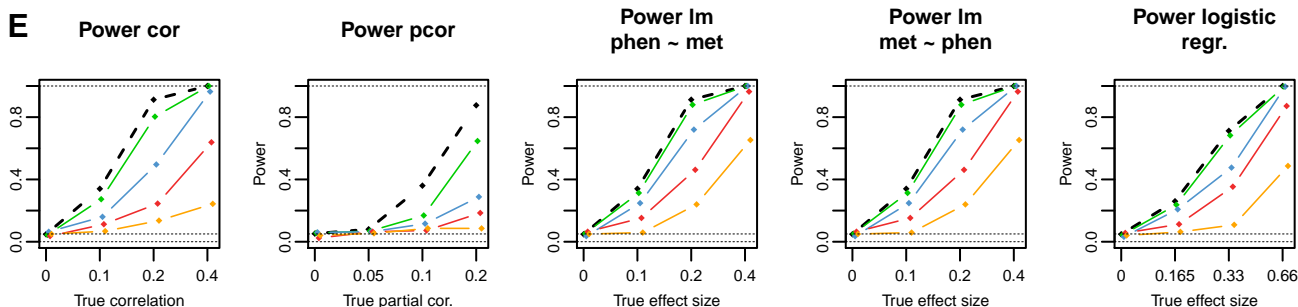
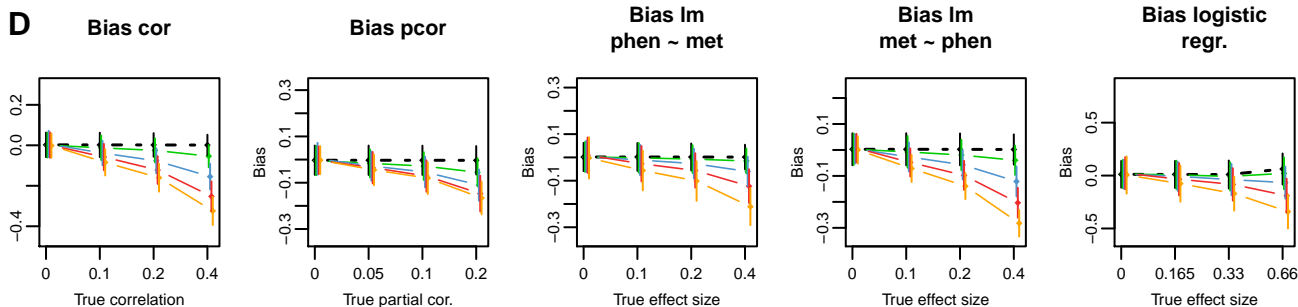
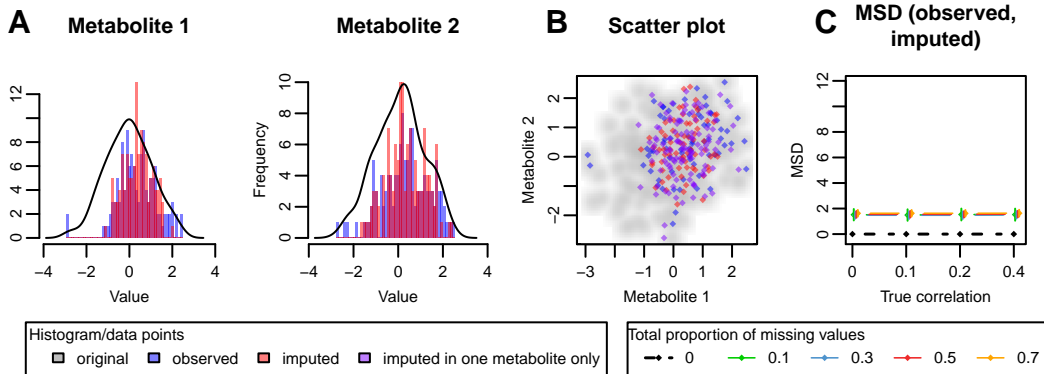


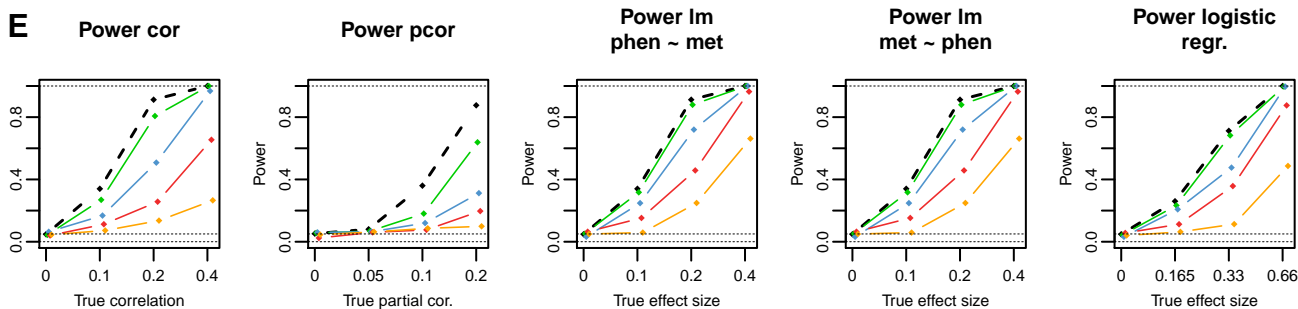
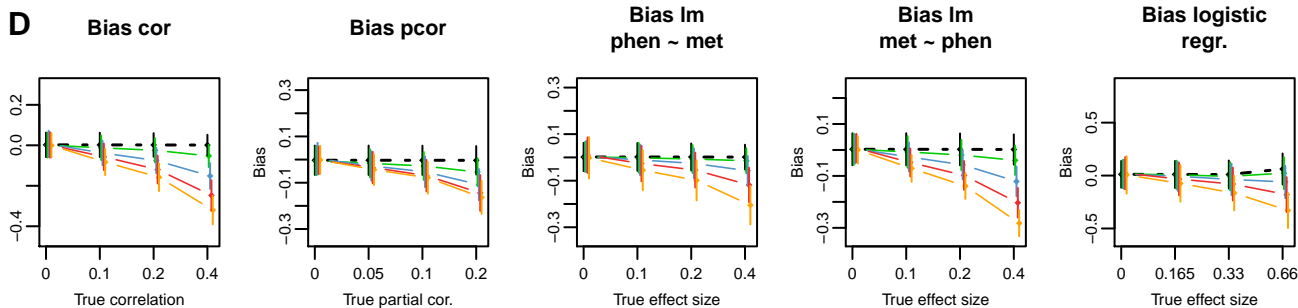
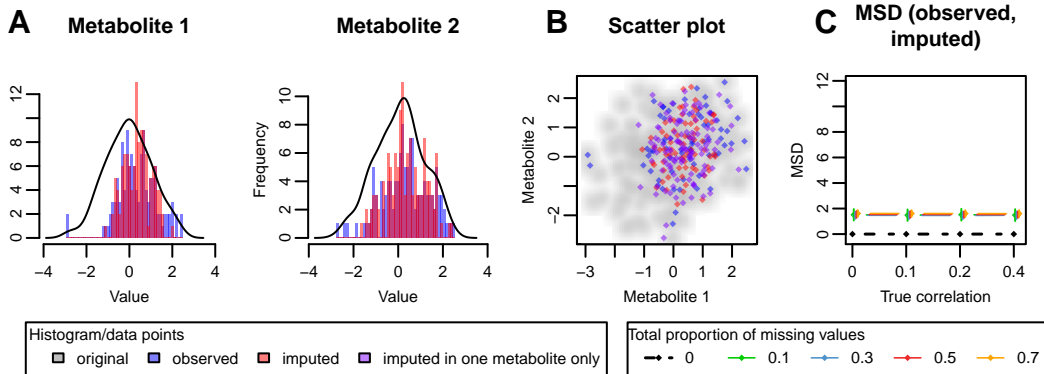


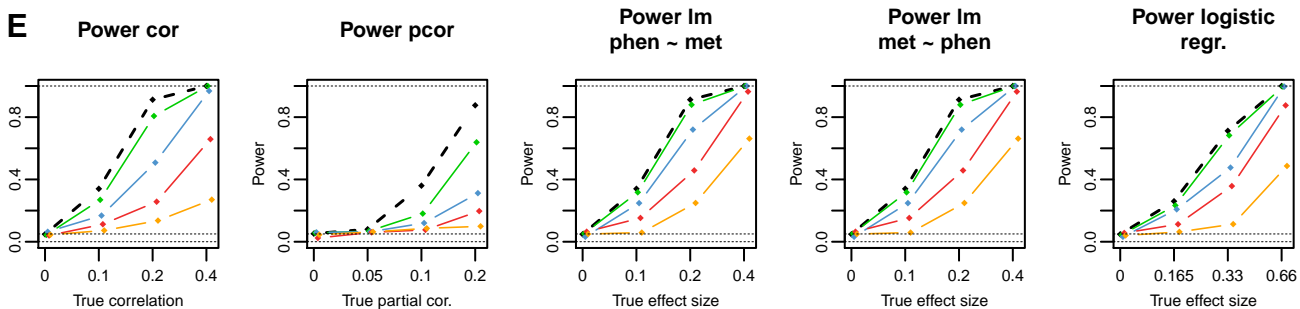
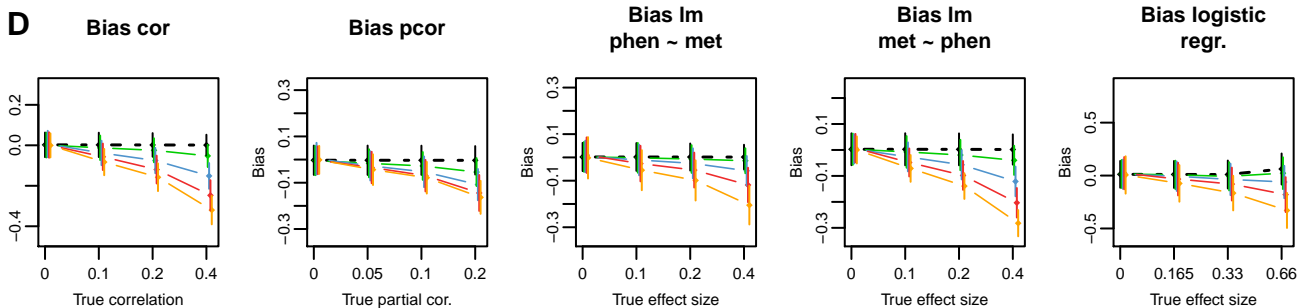
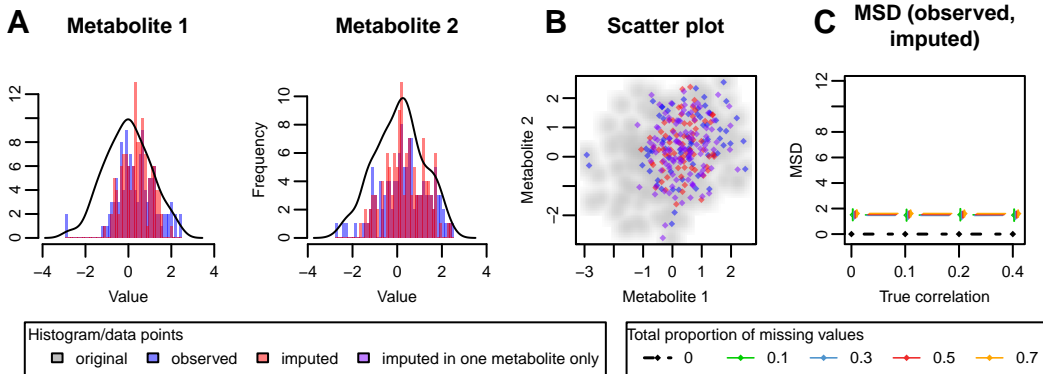


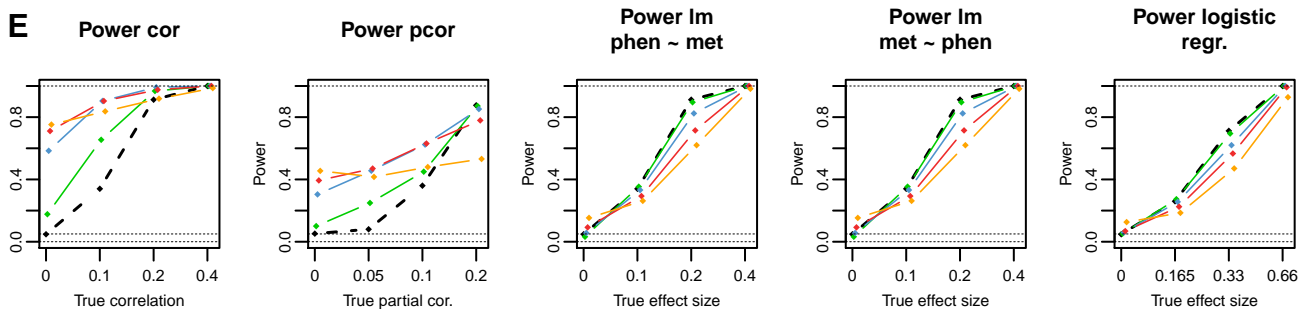
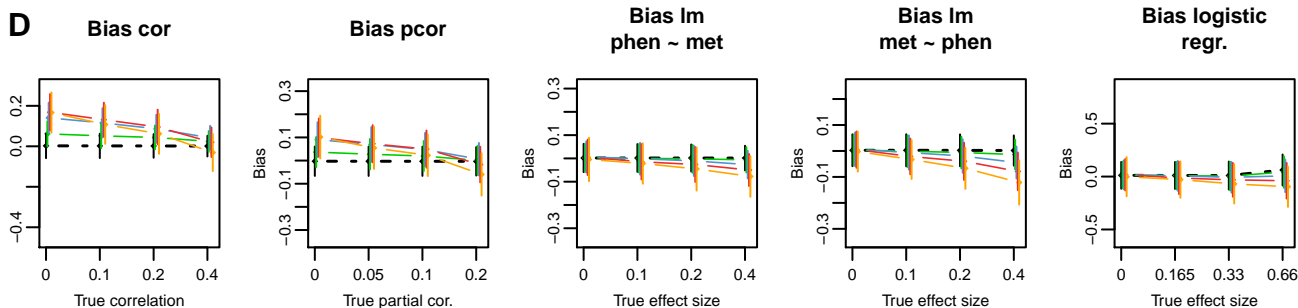
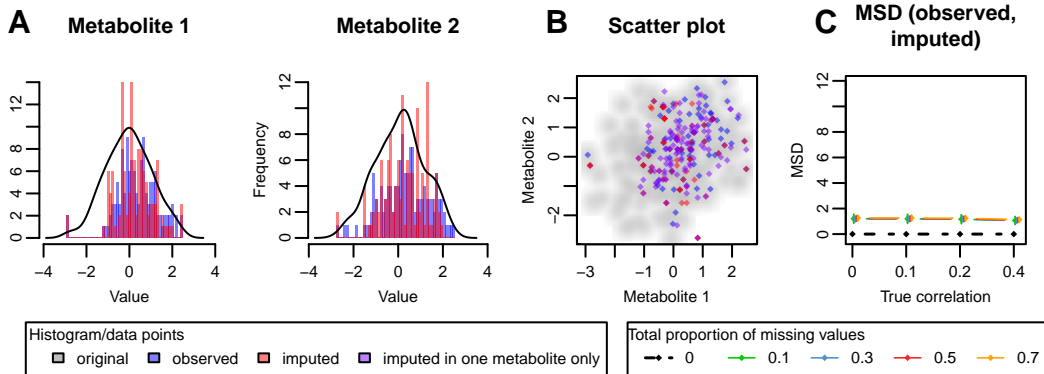


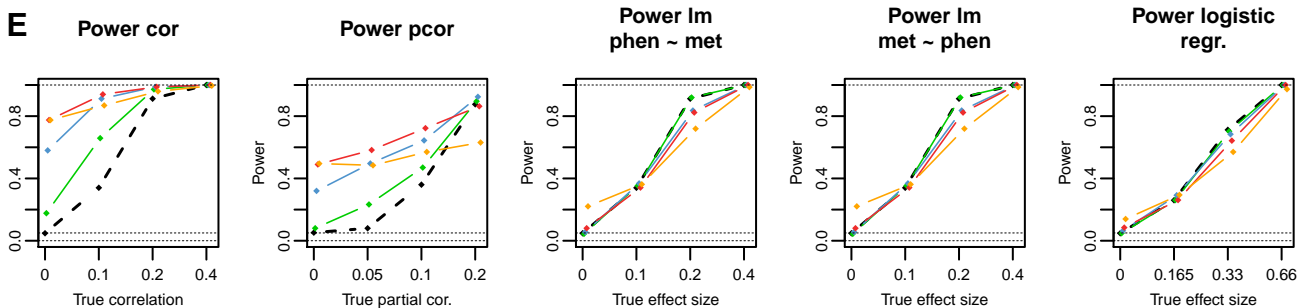
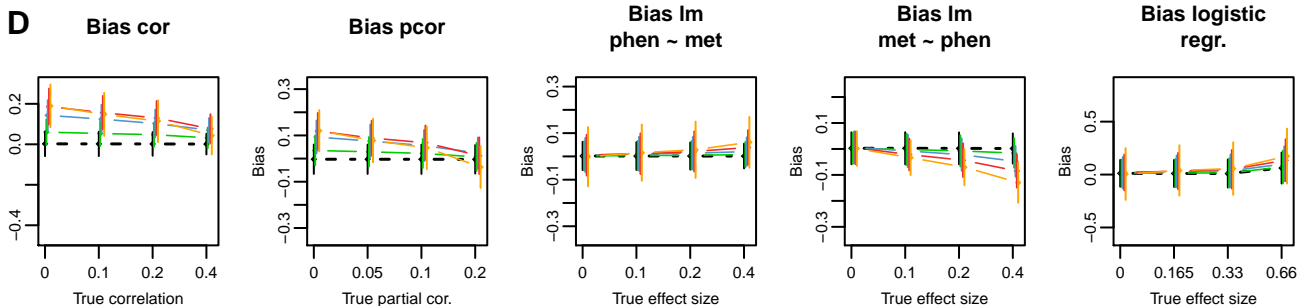
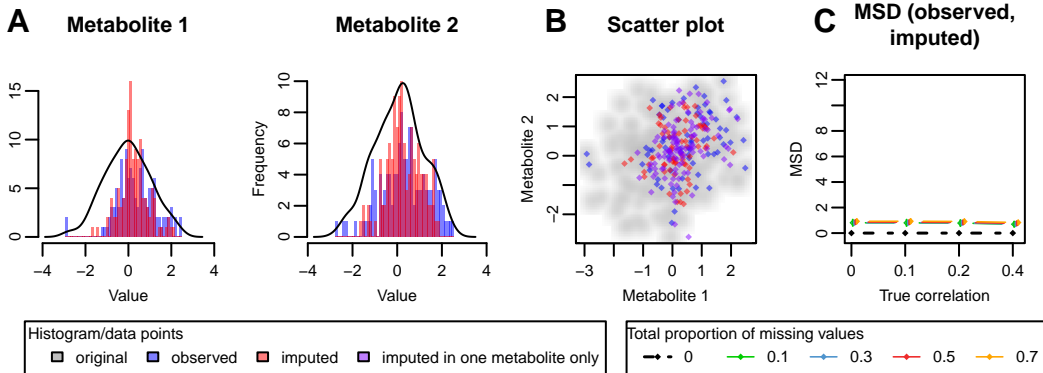


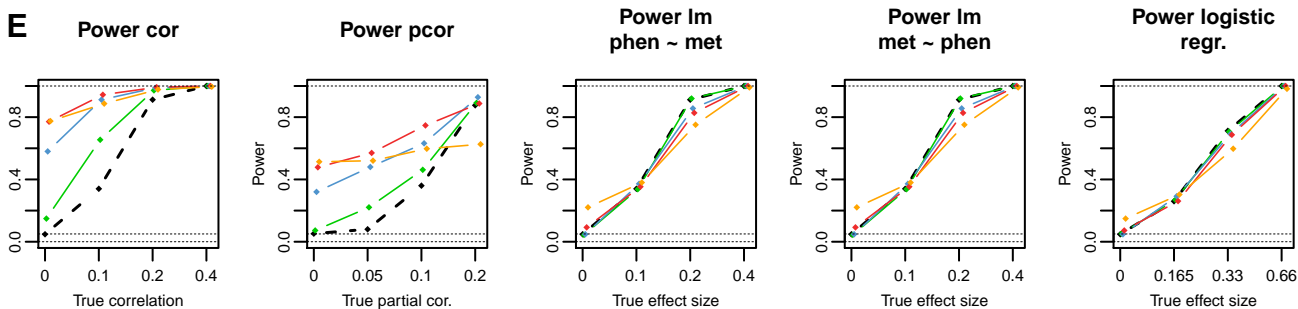
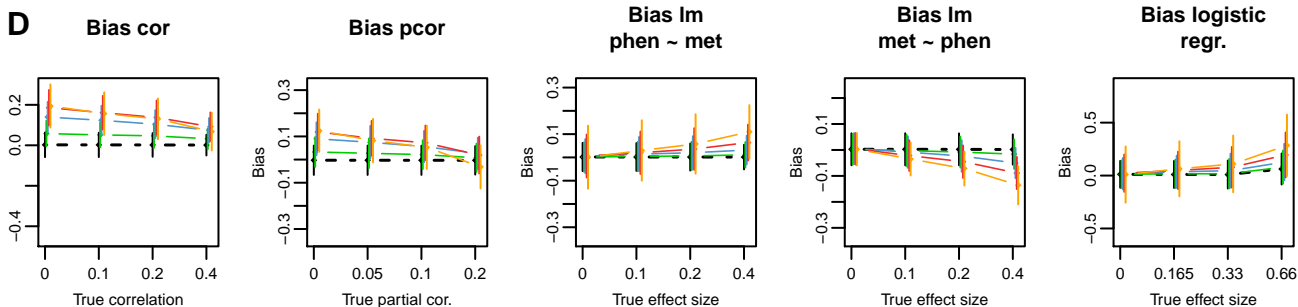
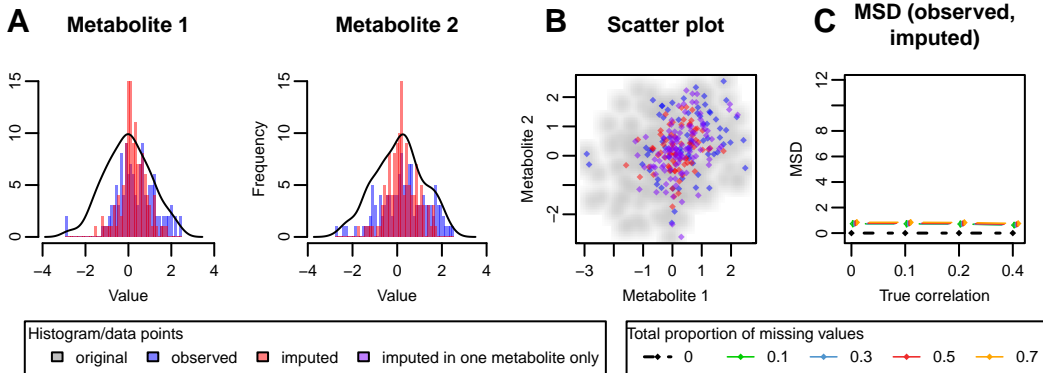


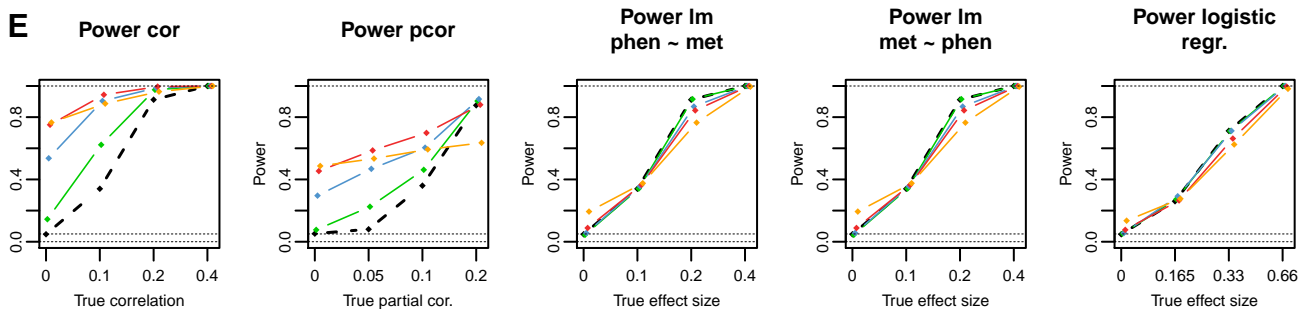
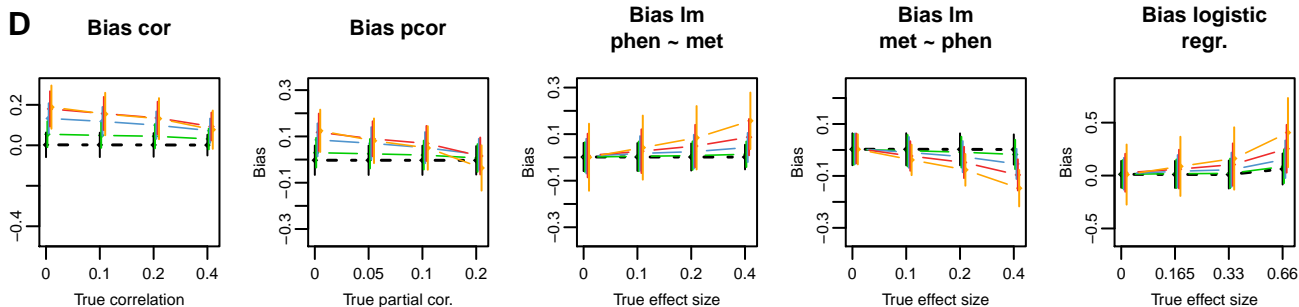
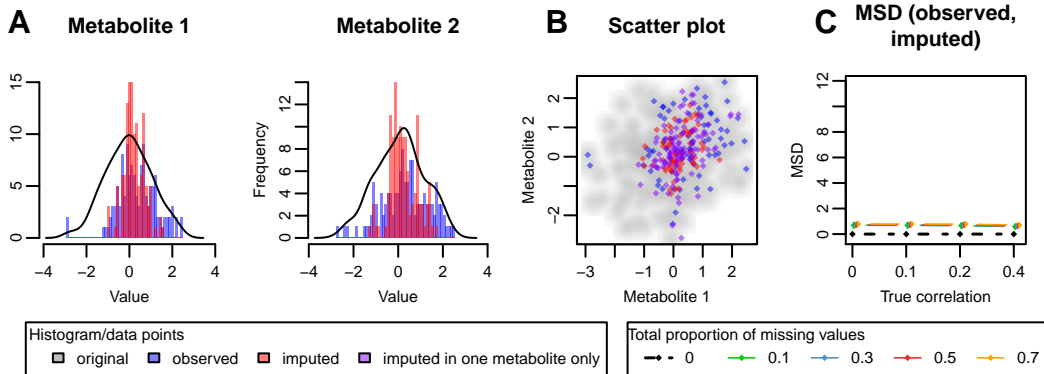


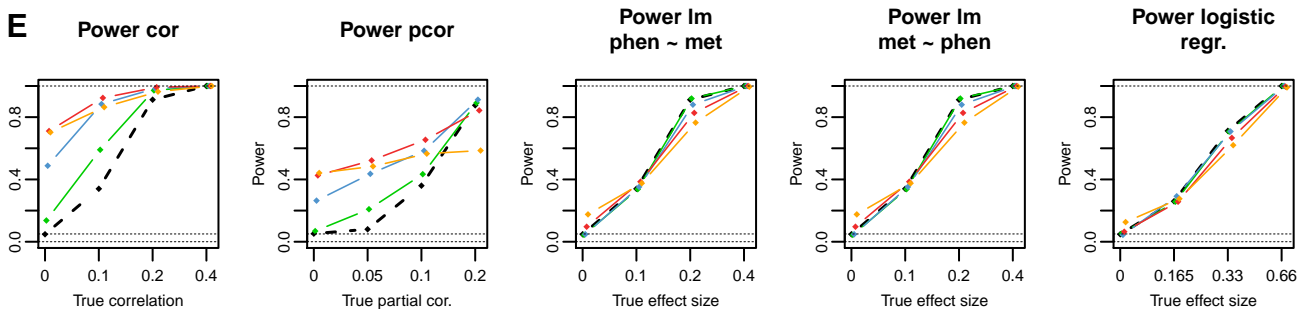
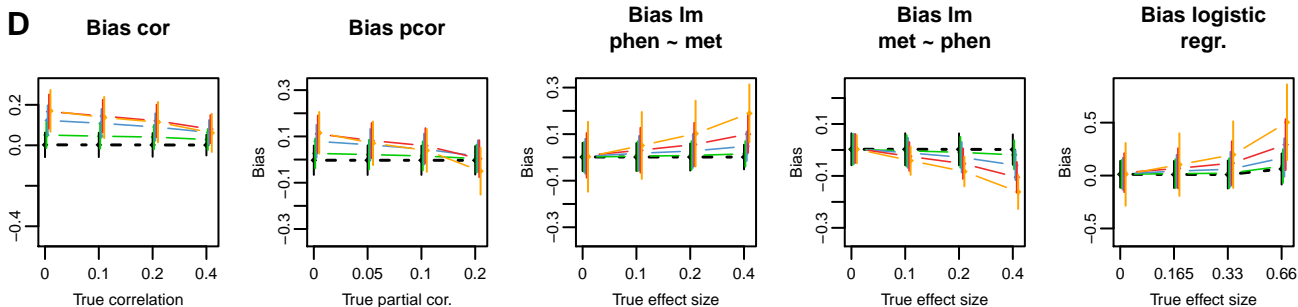
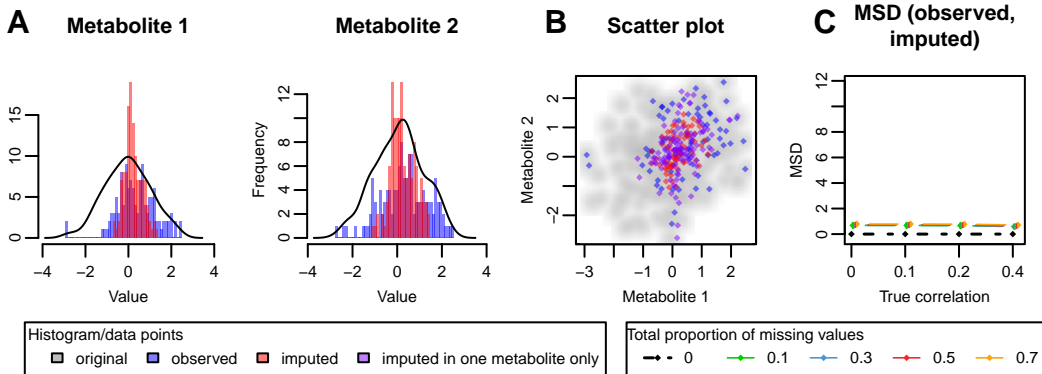




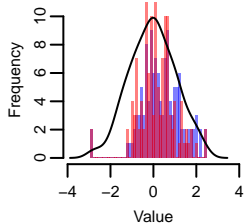




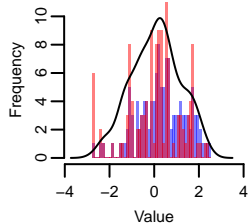




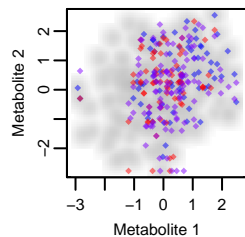
A Metabolite 1



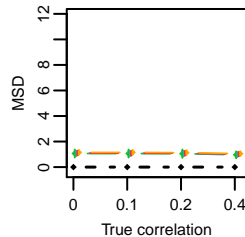
Metabolite 2



B Scatter plot



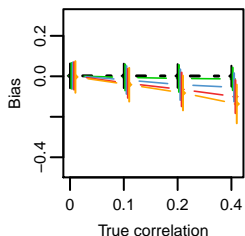
C MSD (observed, imputed)



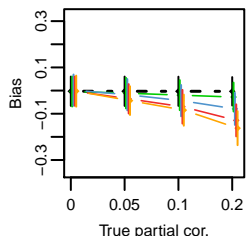
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 - - 0 — 0.1 — 0.3 — 0.5 — 0.7

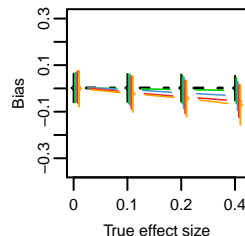
D Bias cor



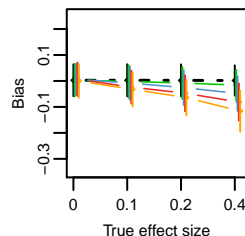
Bias pcor



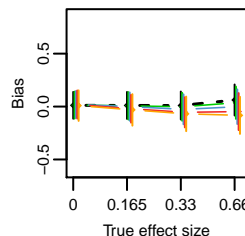
Bias lm phen ~ met



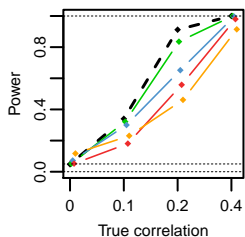
Bias lm met ~ phen



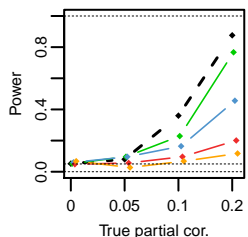
Bias logistic regr.



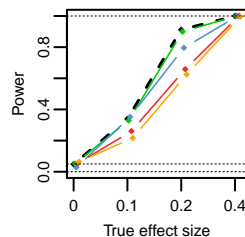
E Power cor



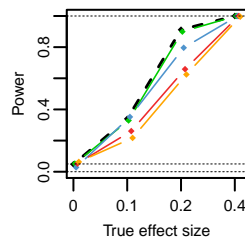
Power pcor



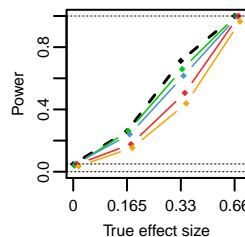
Power lm phen ~ met

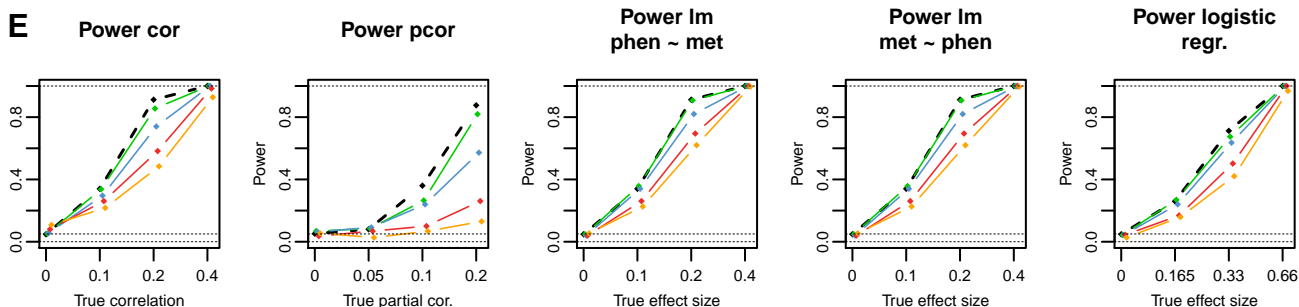
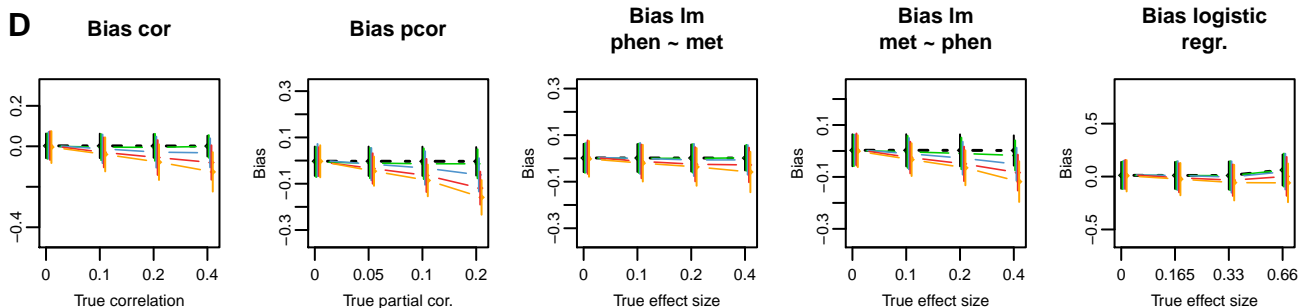
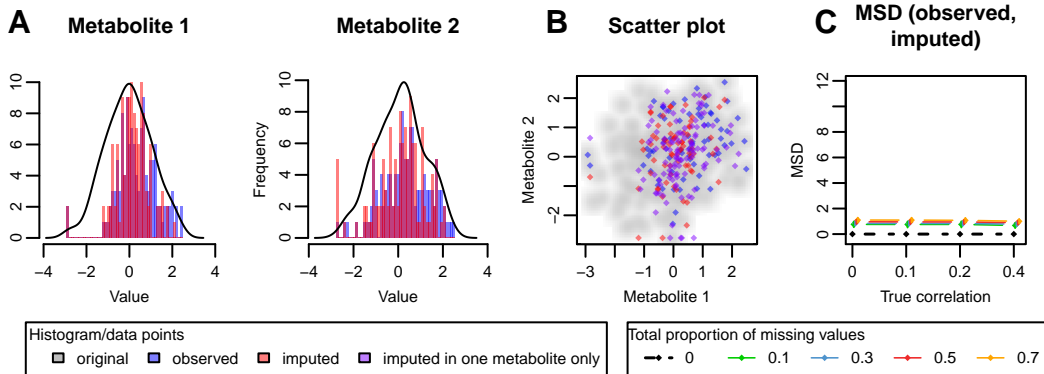


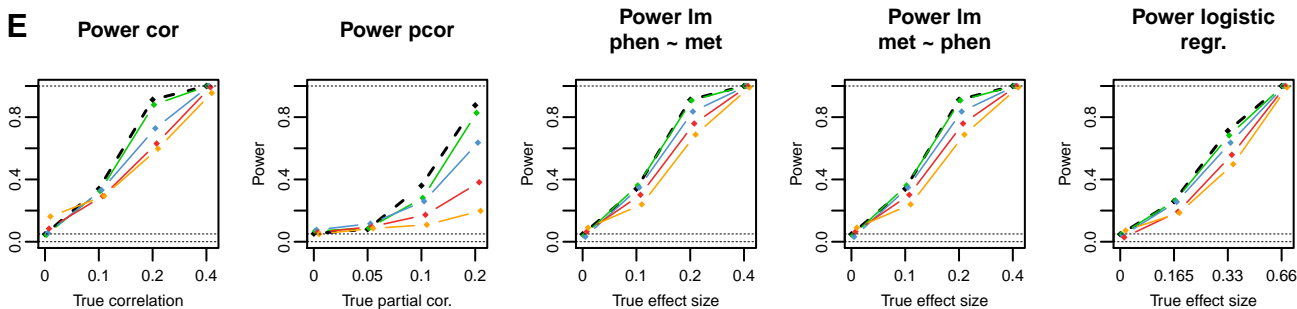
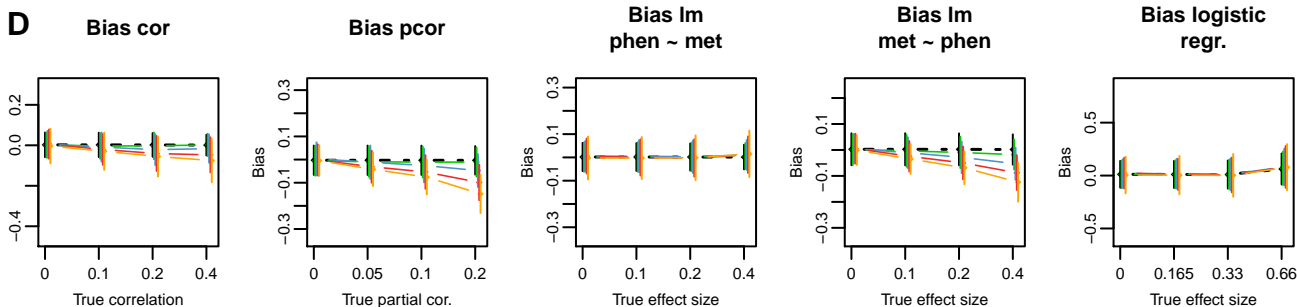
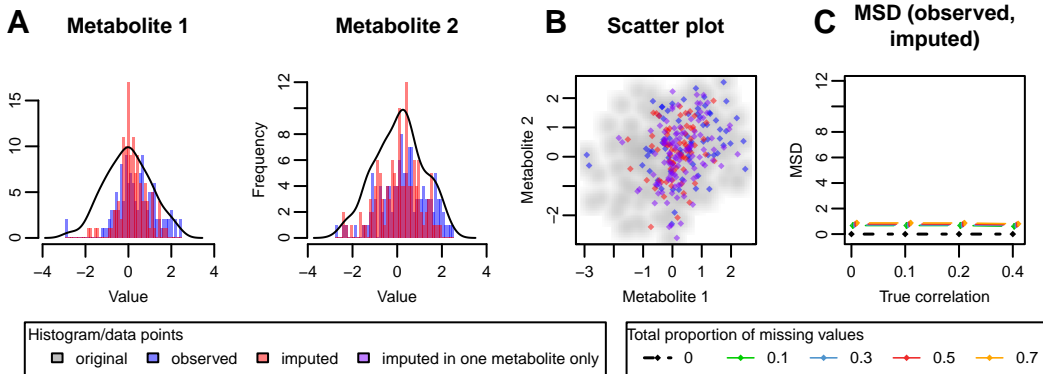
Power lm met ~ phen

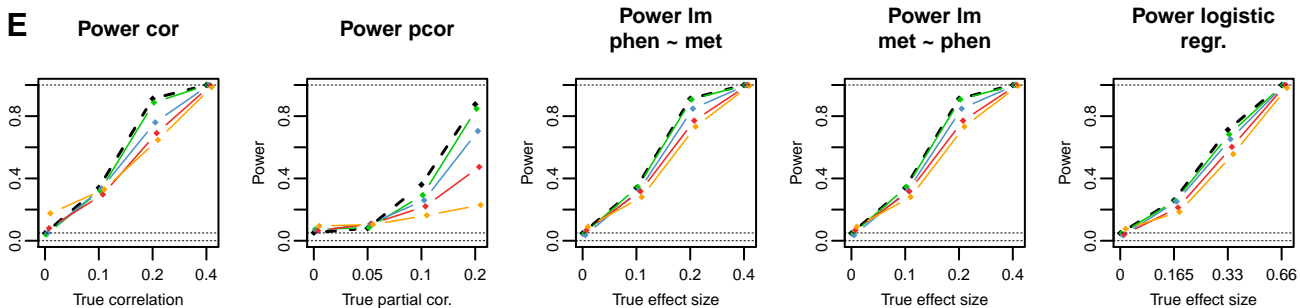
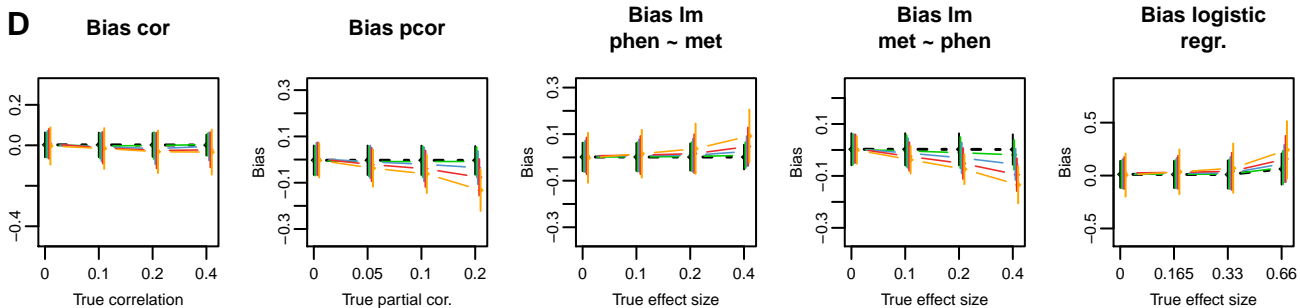
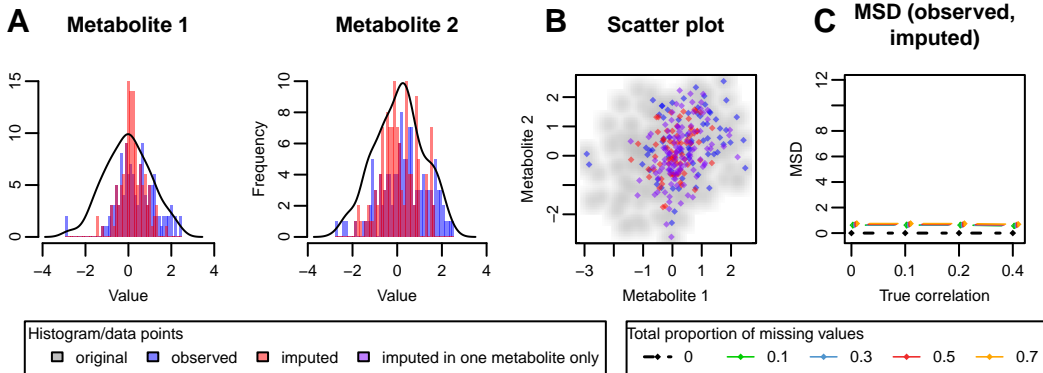


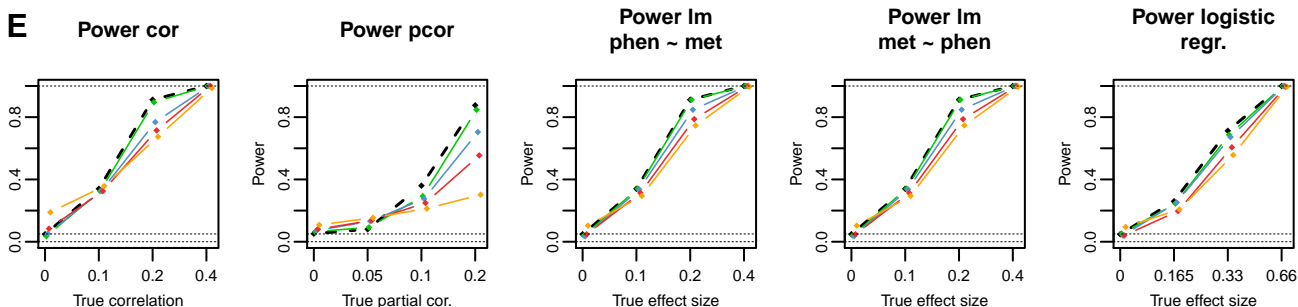
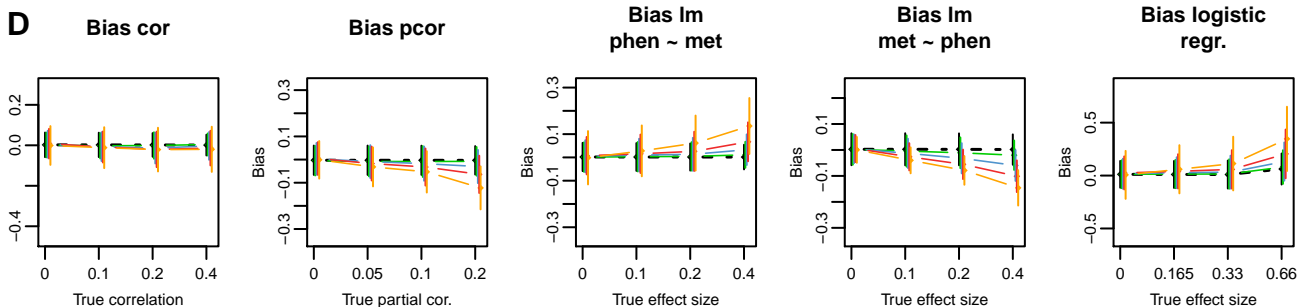
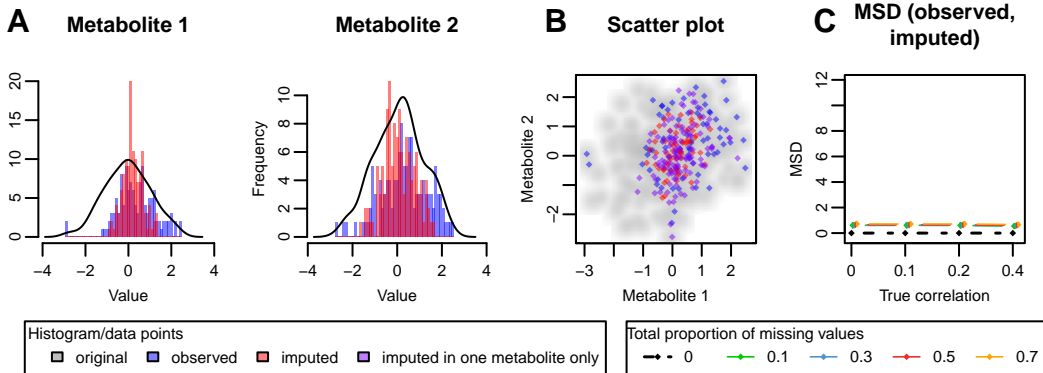
Power logistic regr.

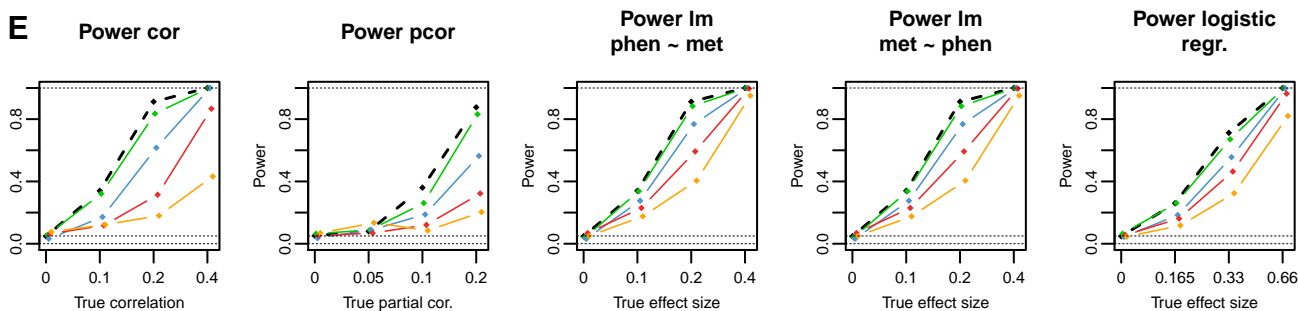
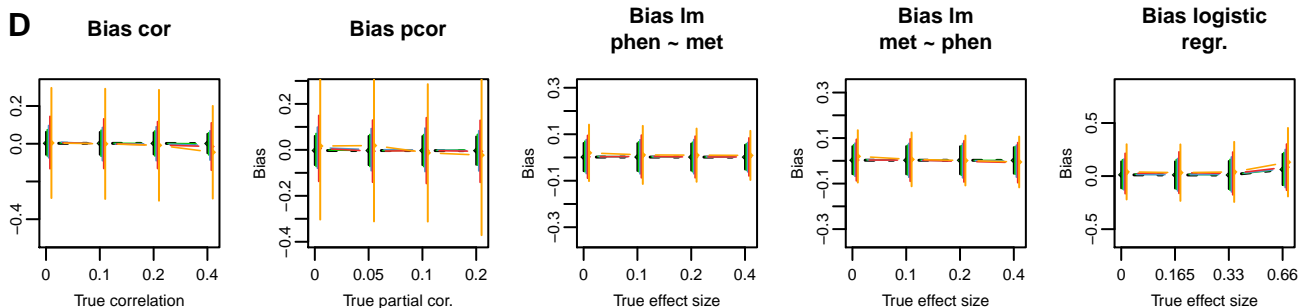
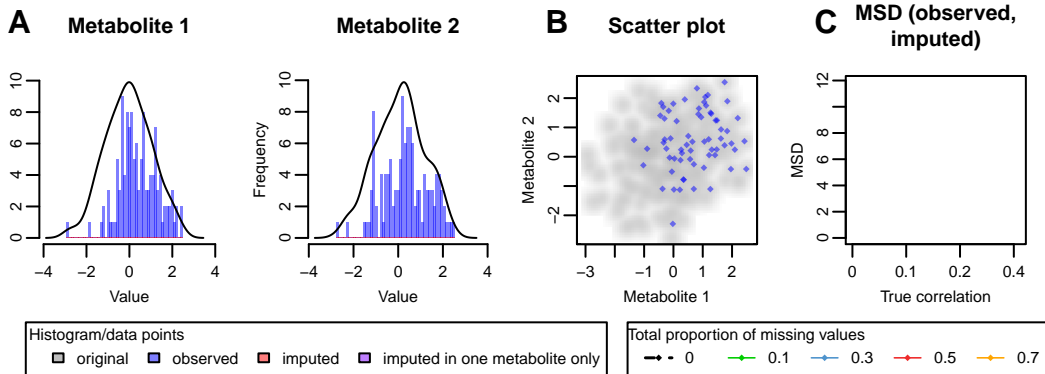


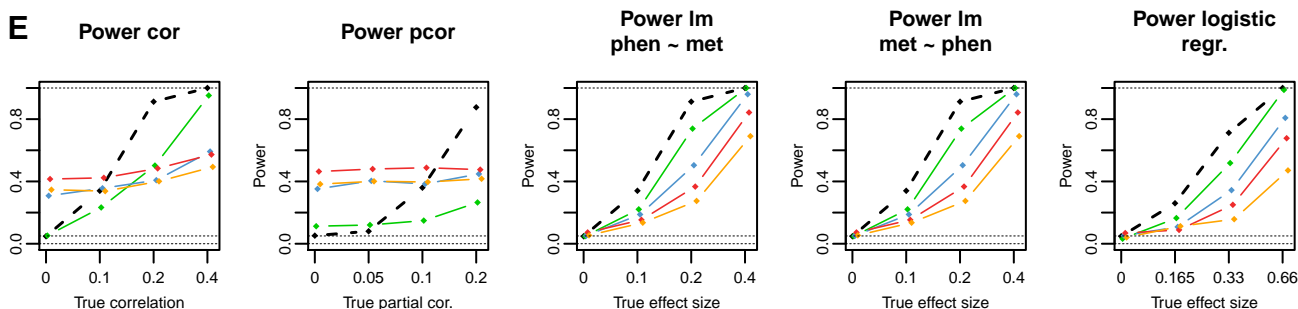
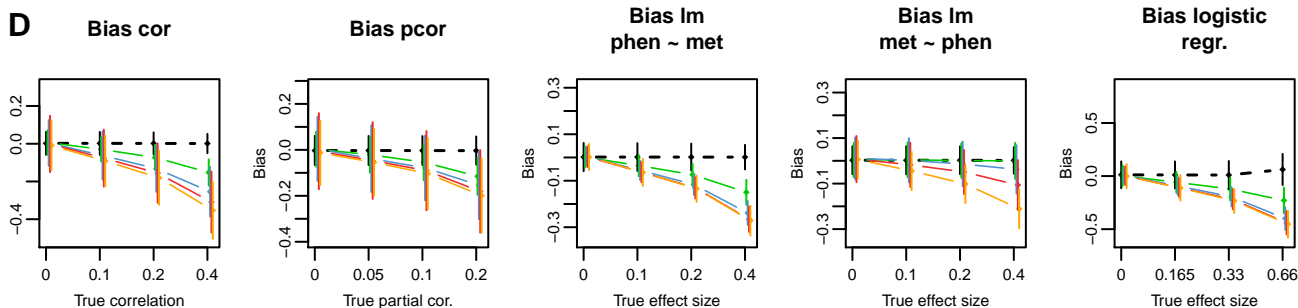
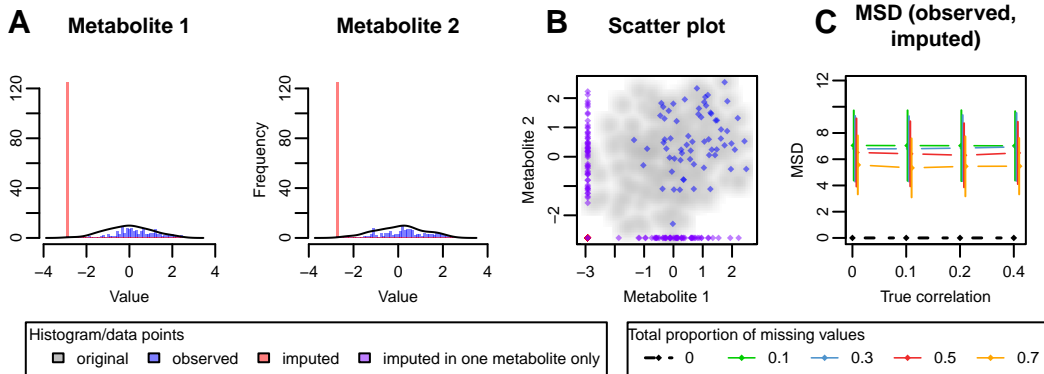


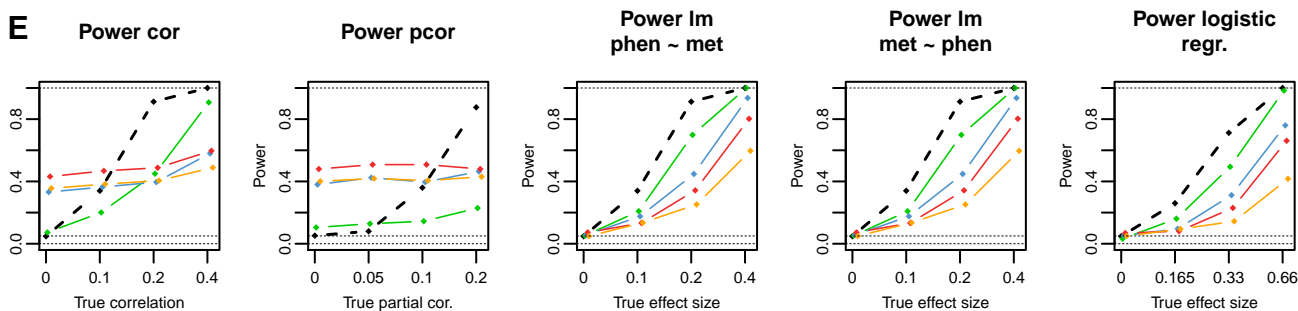
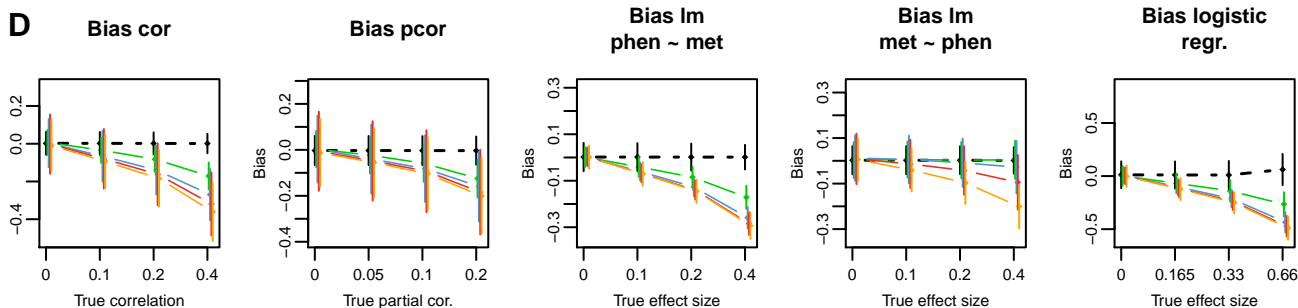
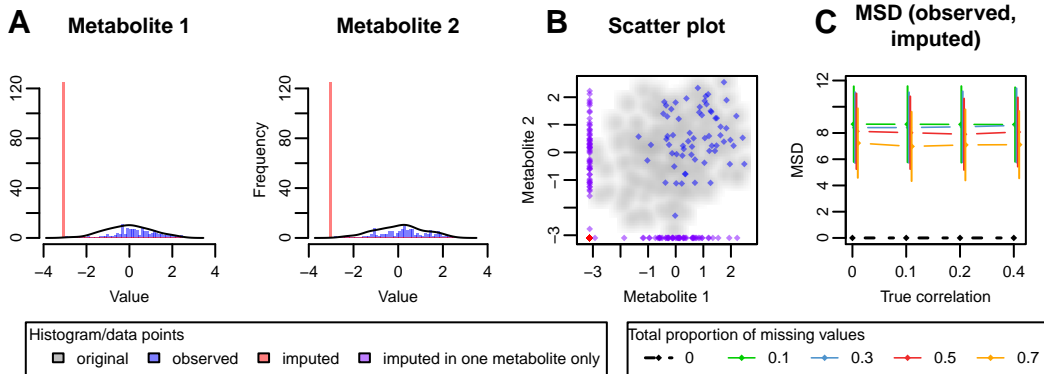


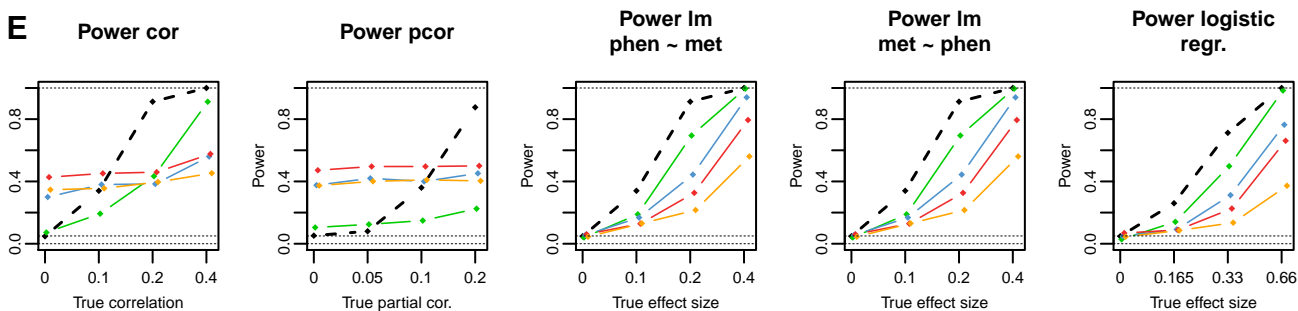
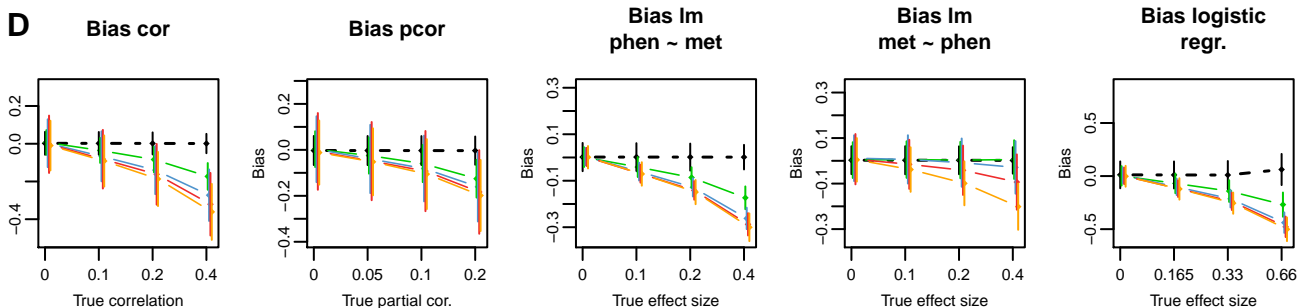
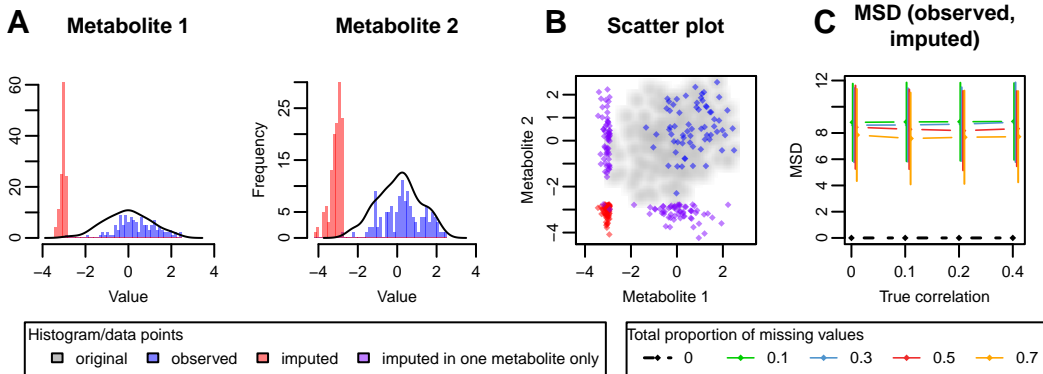


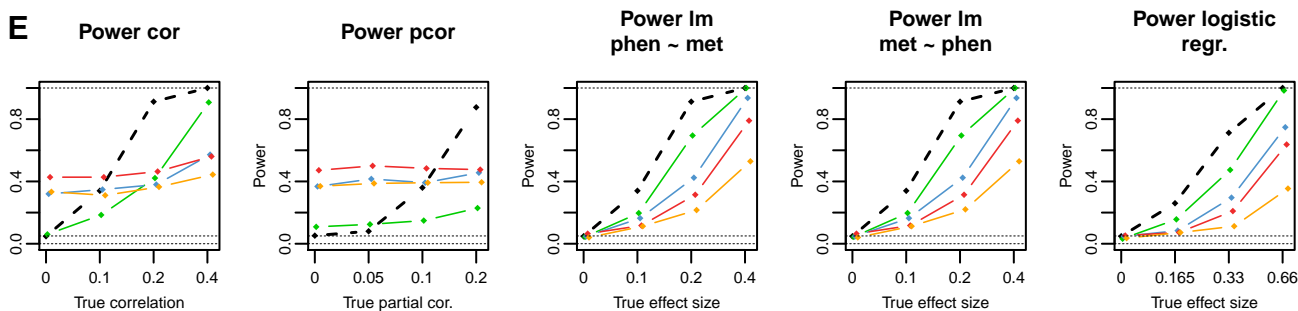
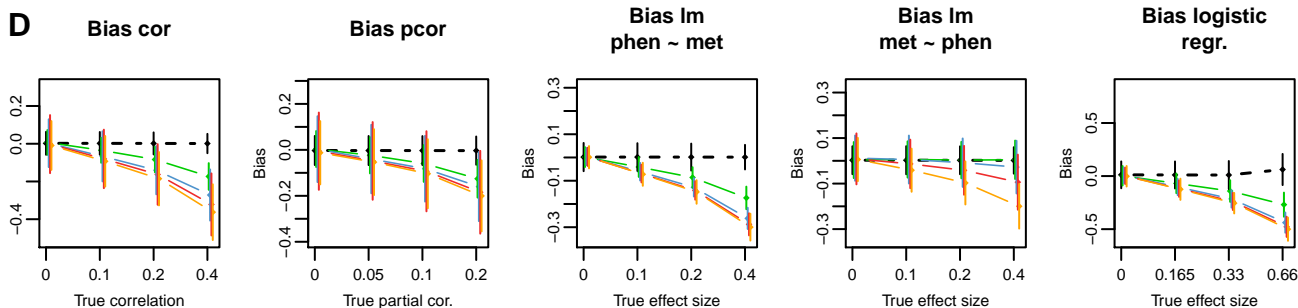
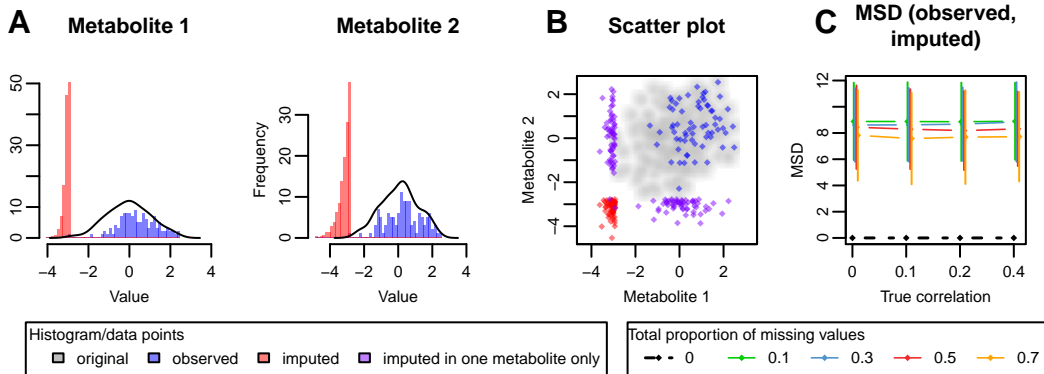


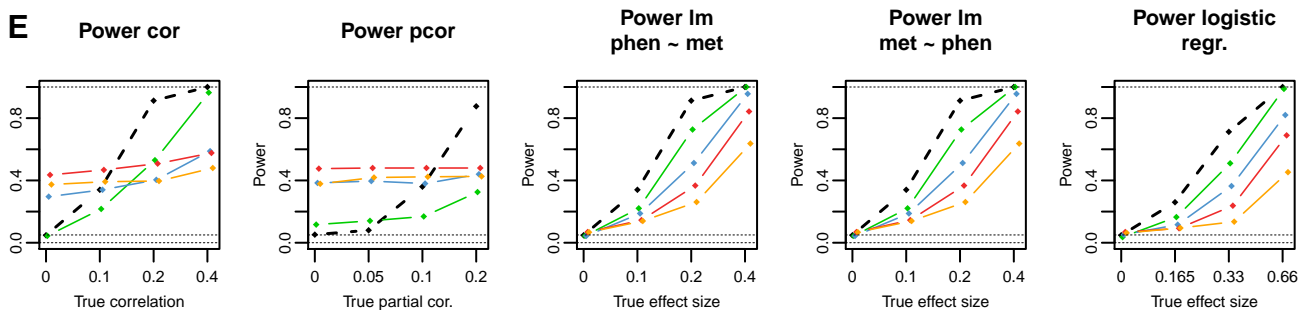
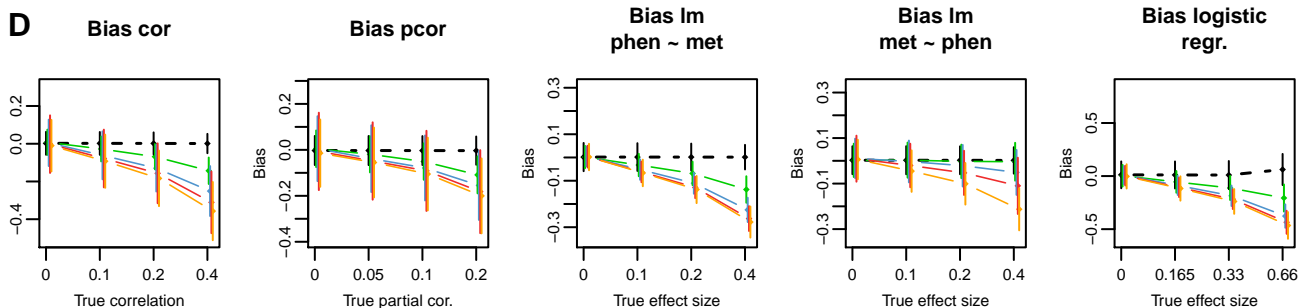
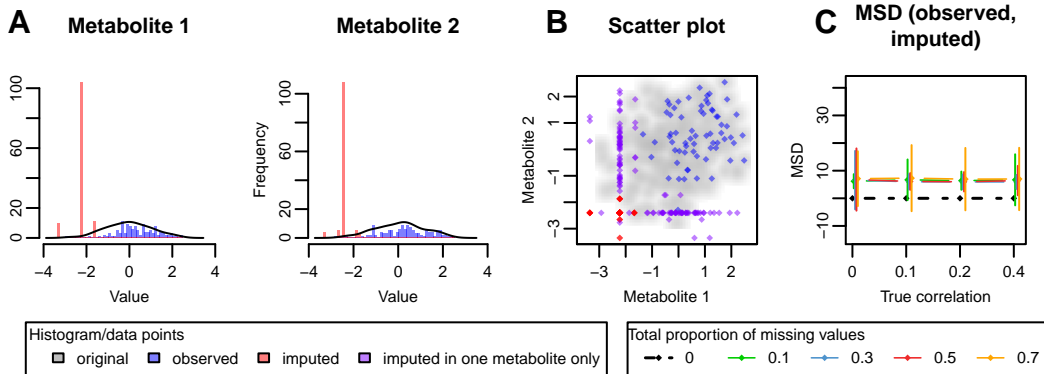


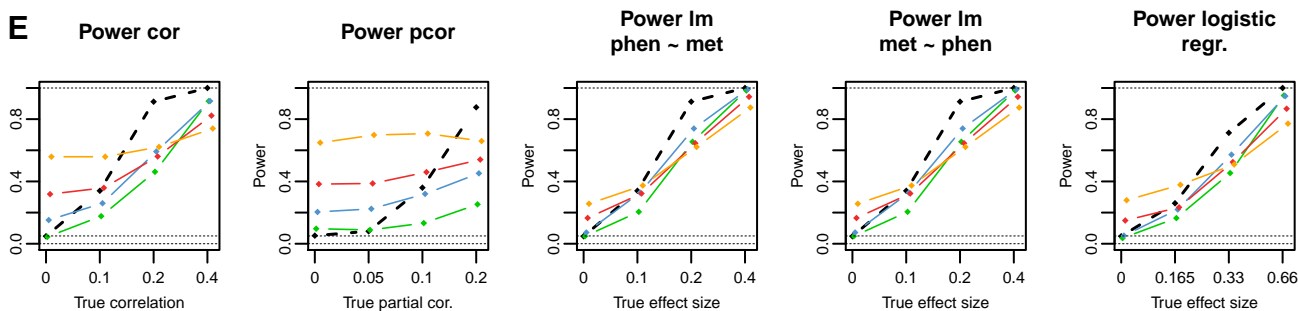
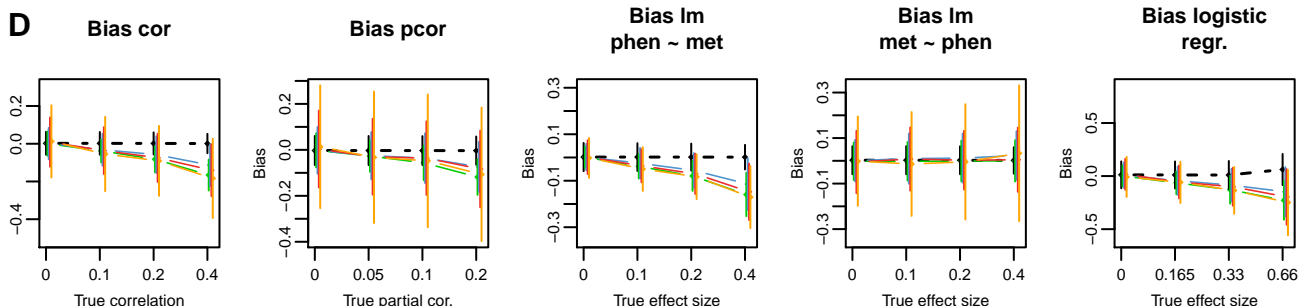
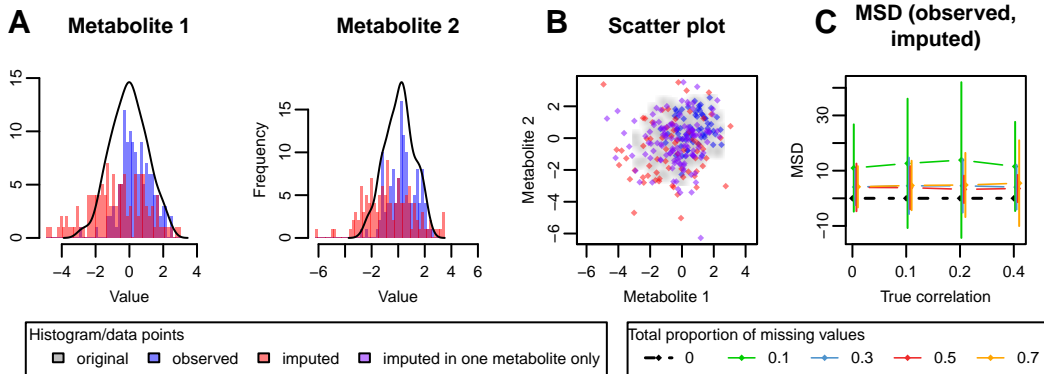


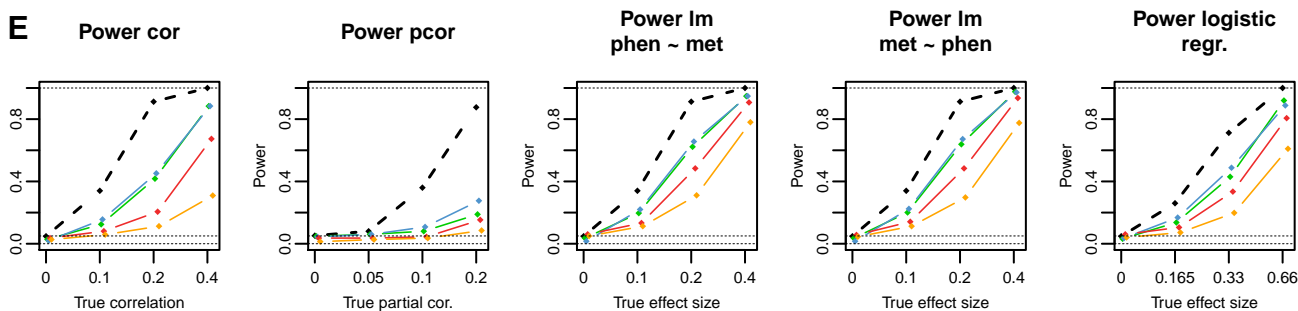
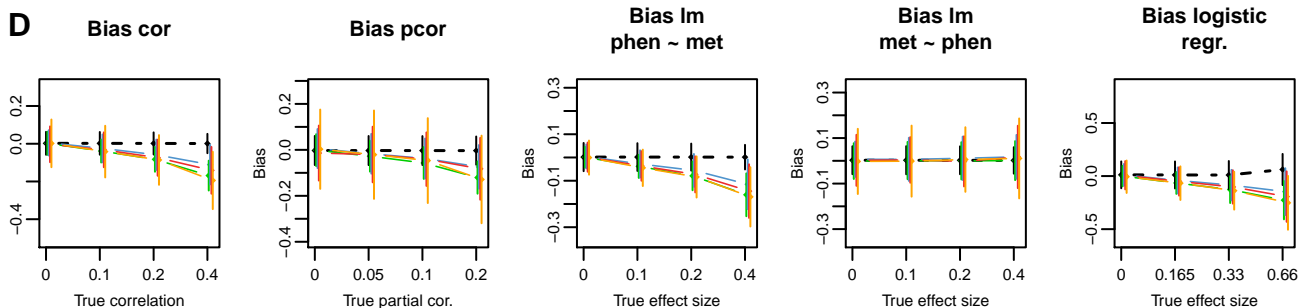
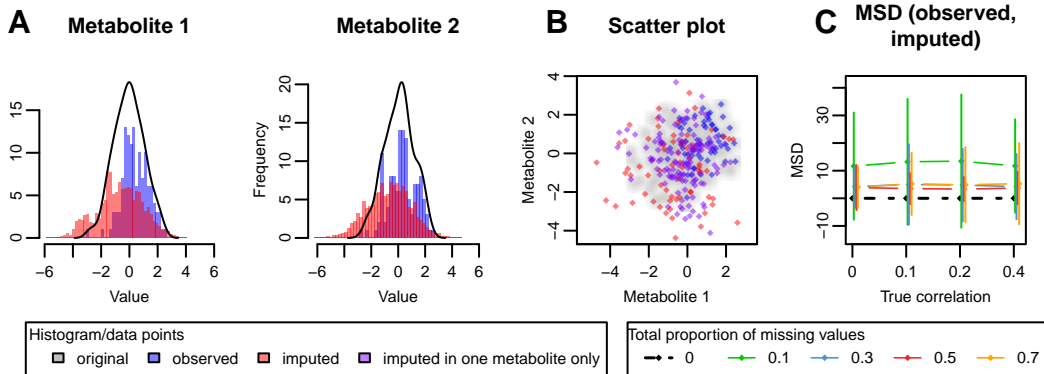


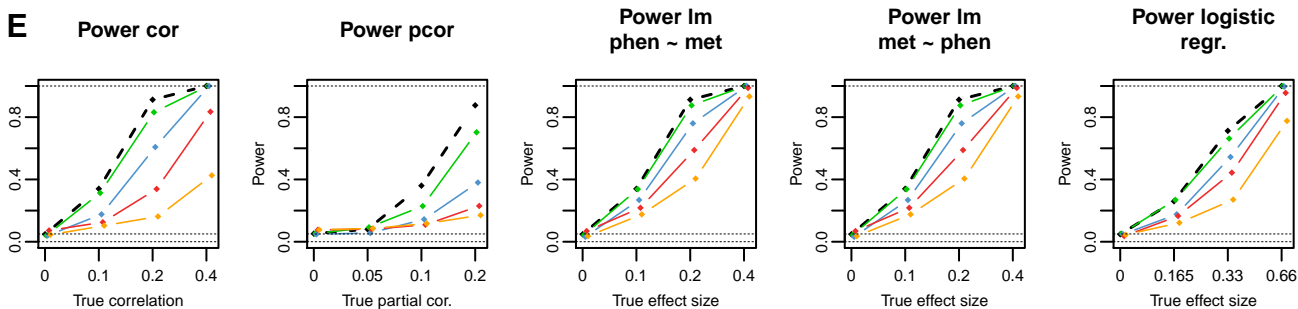
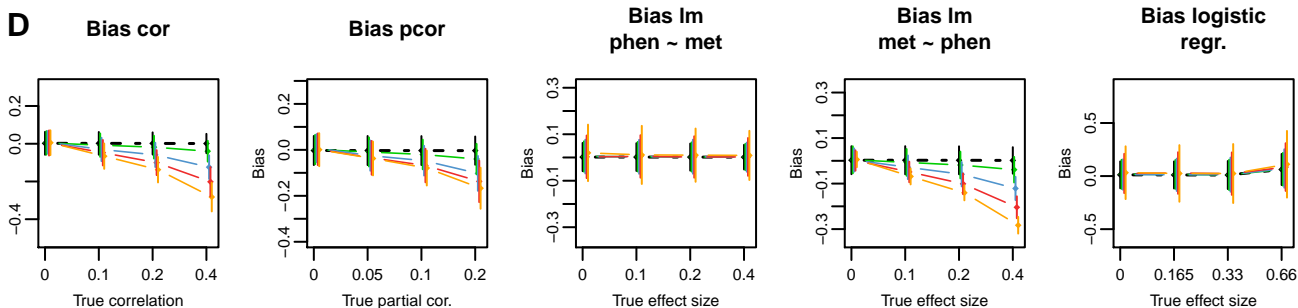
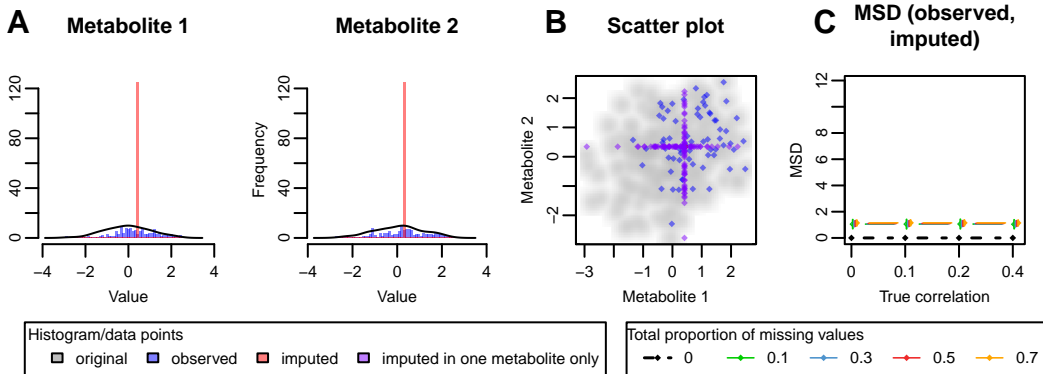


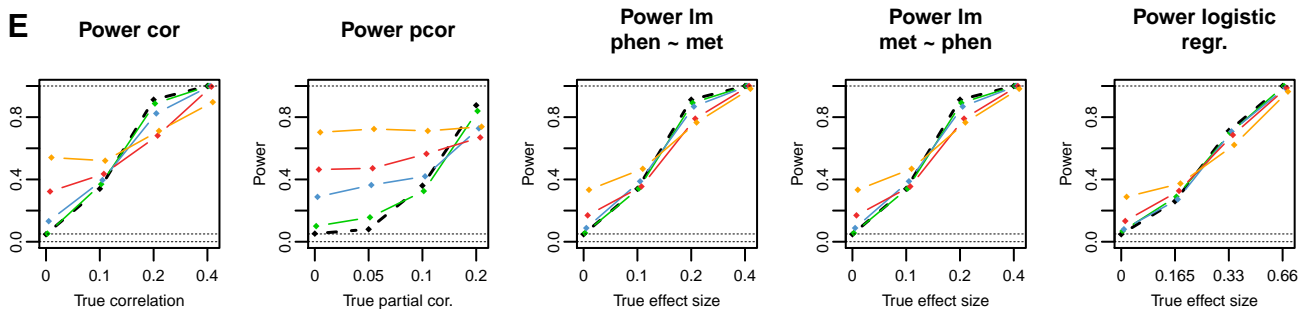
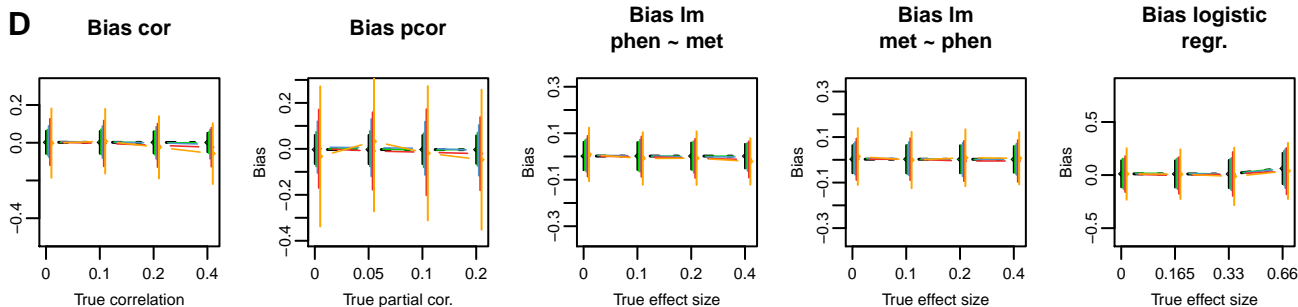
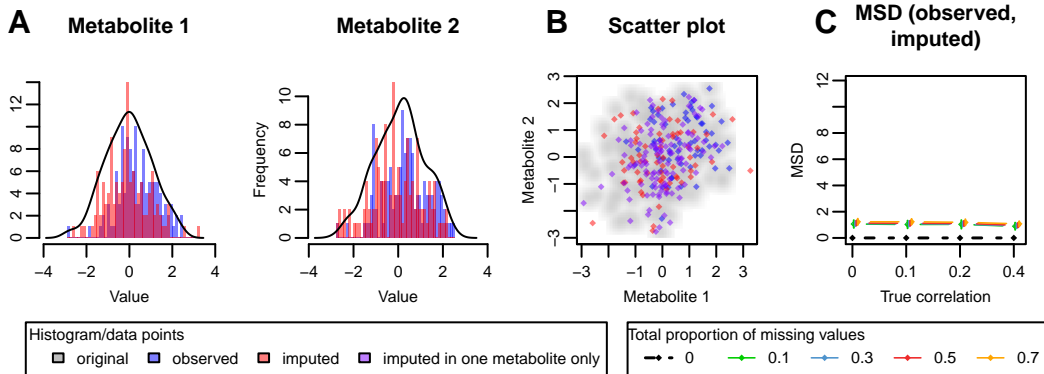


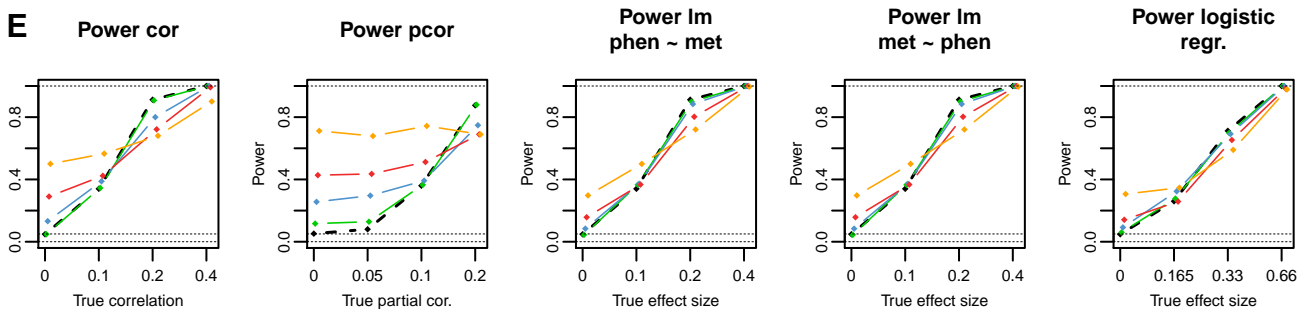
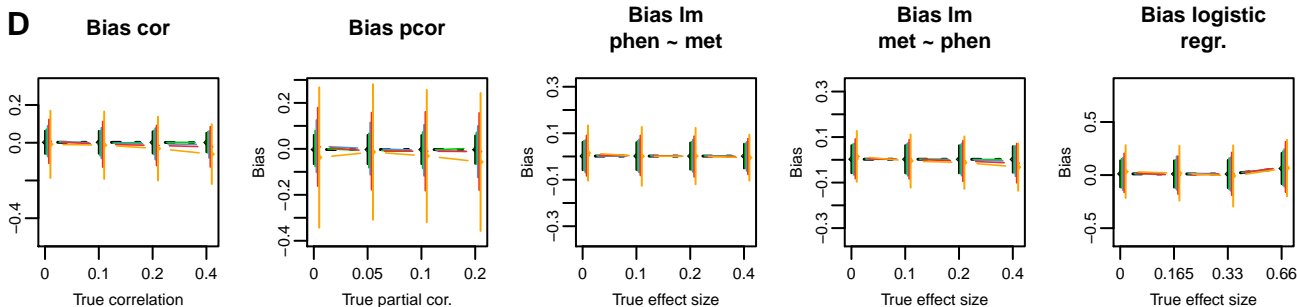
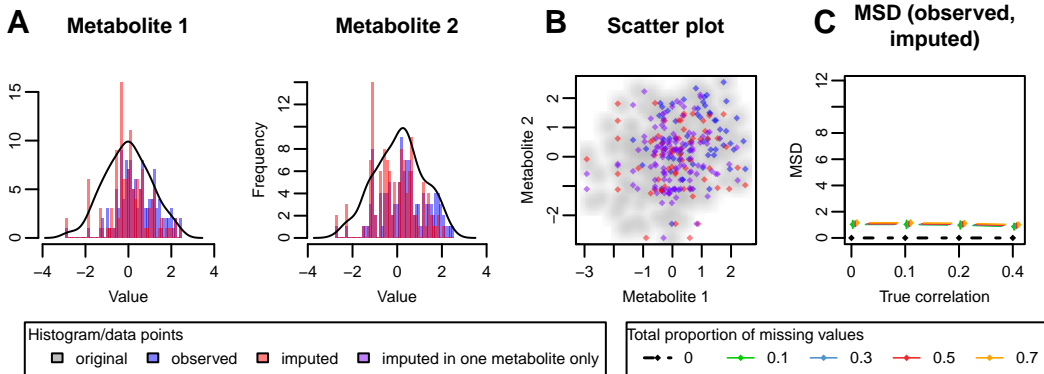


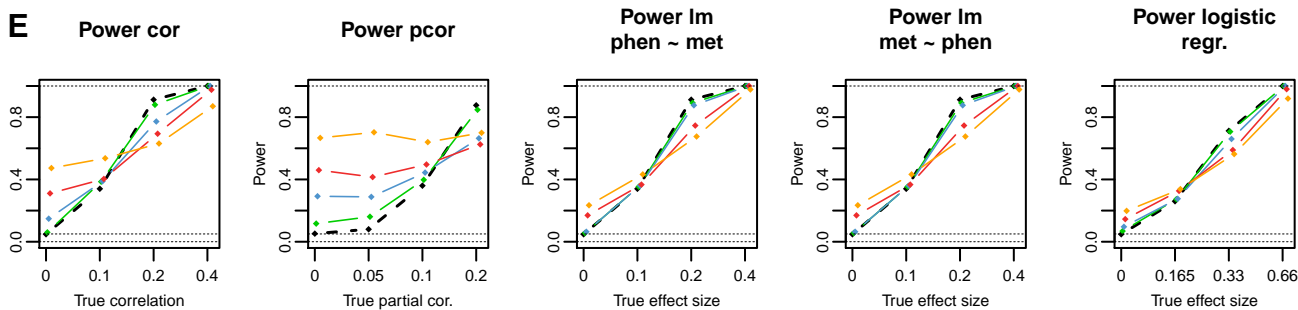
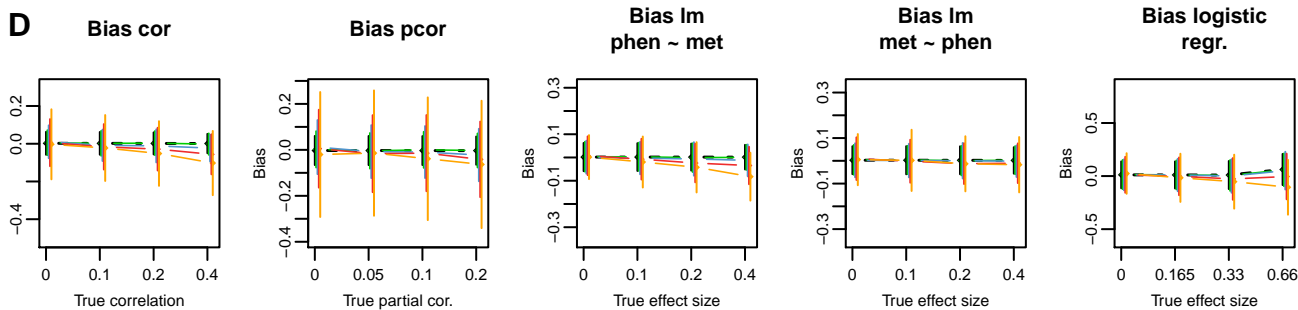
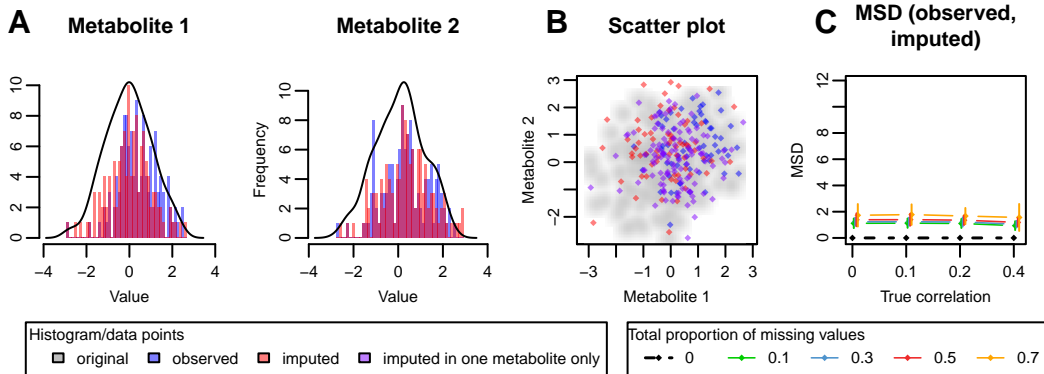


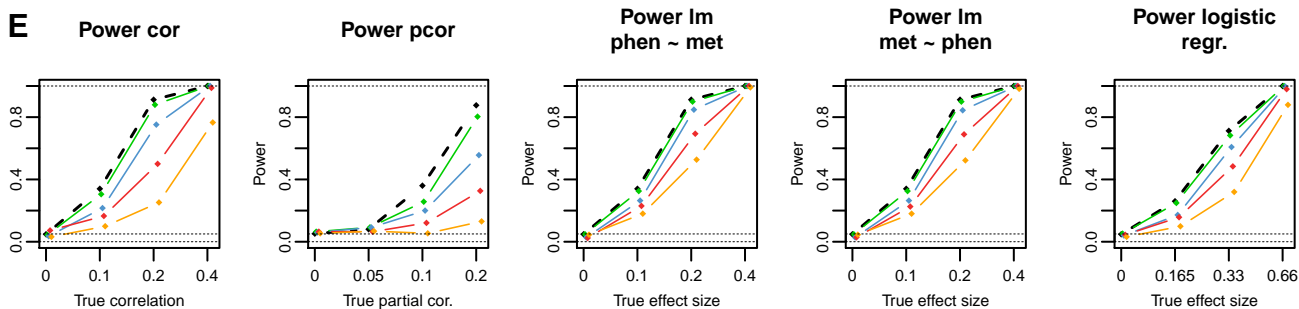
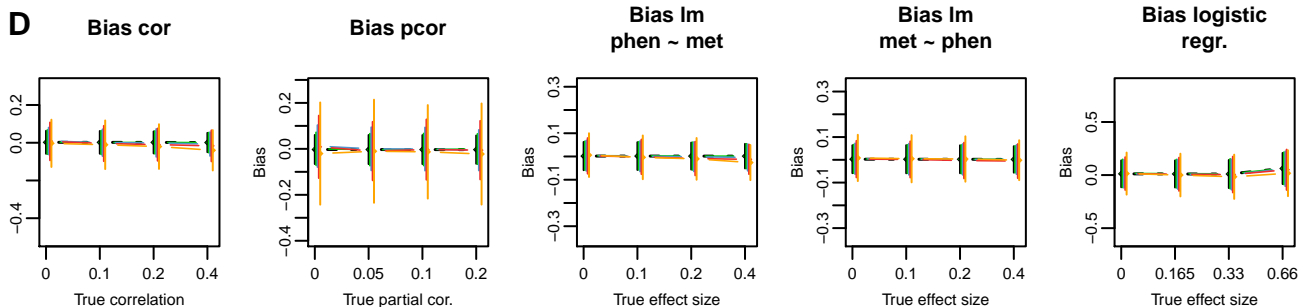
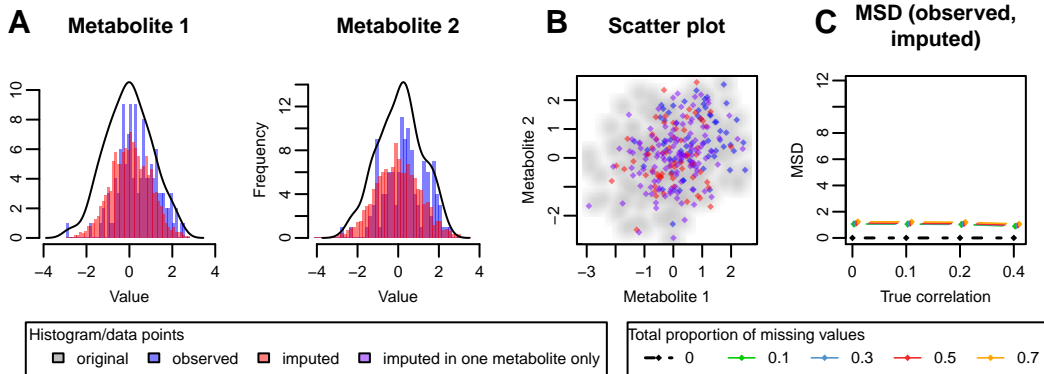


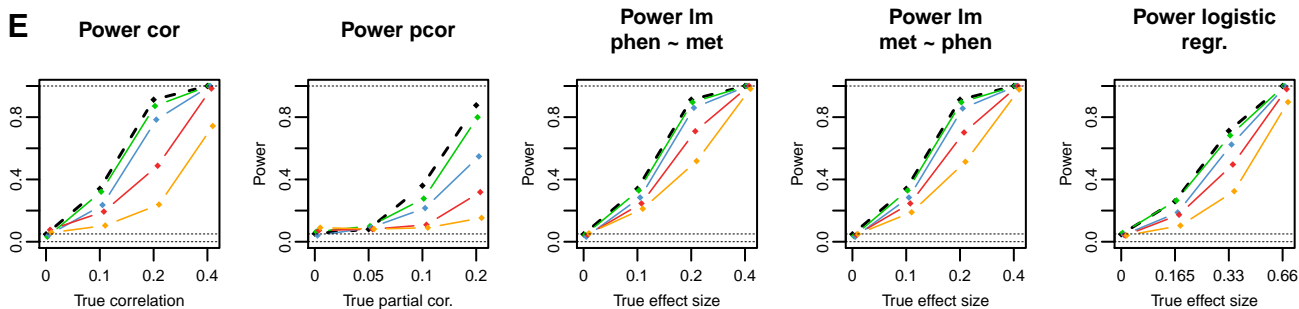
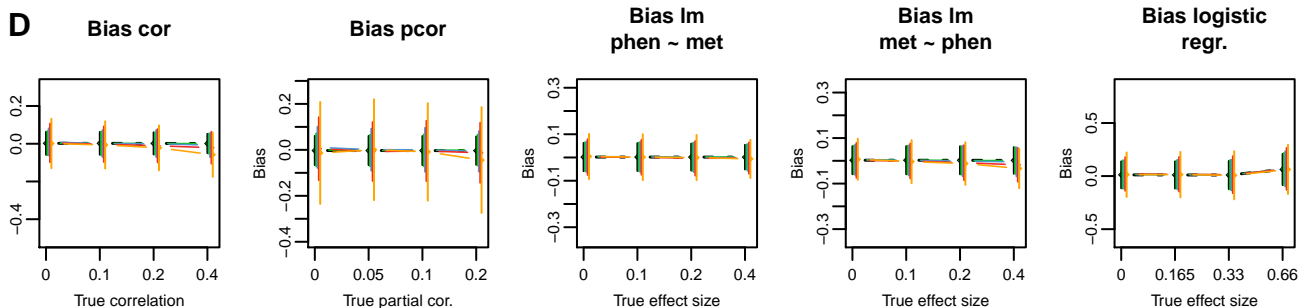
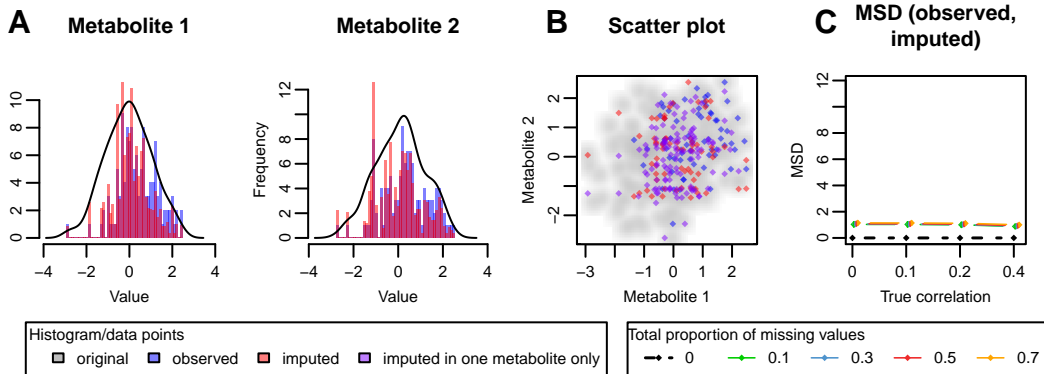


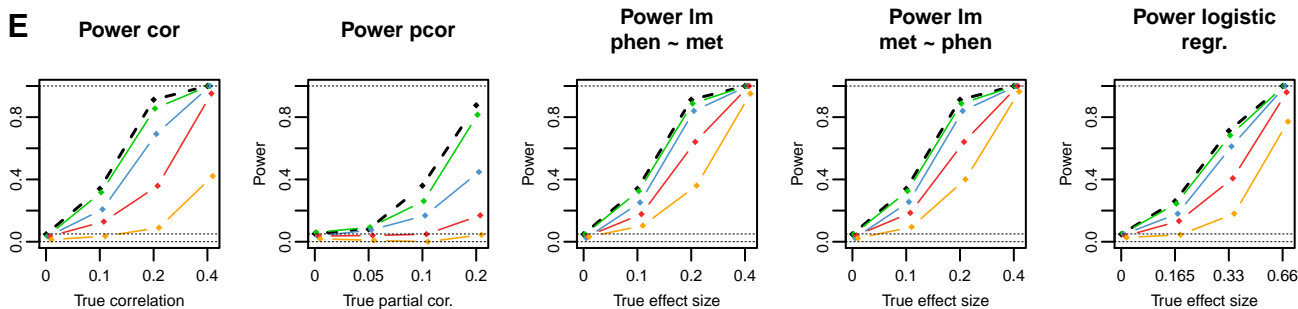
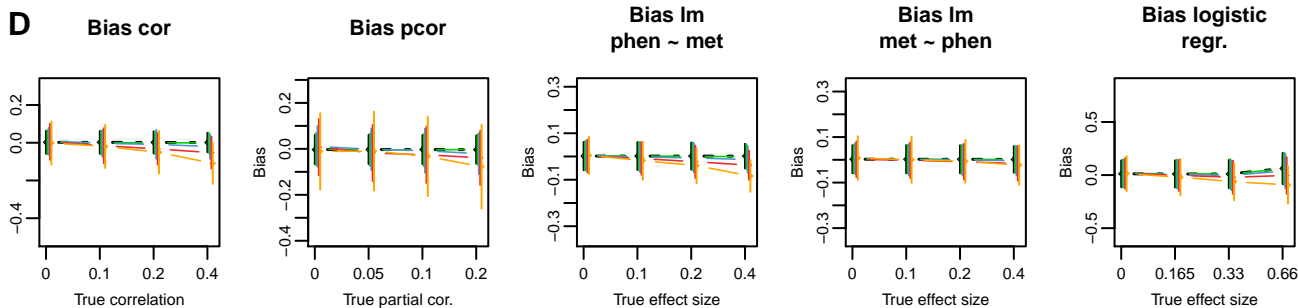
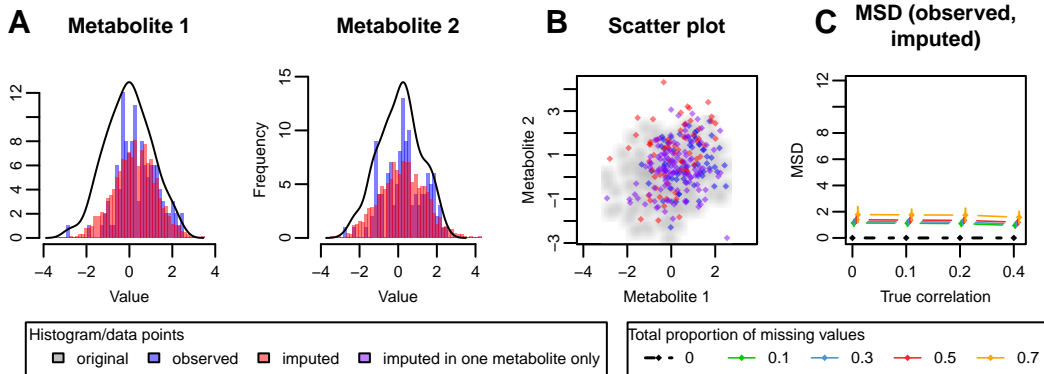


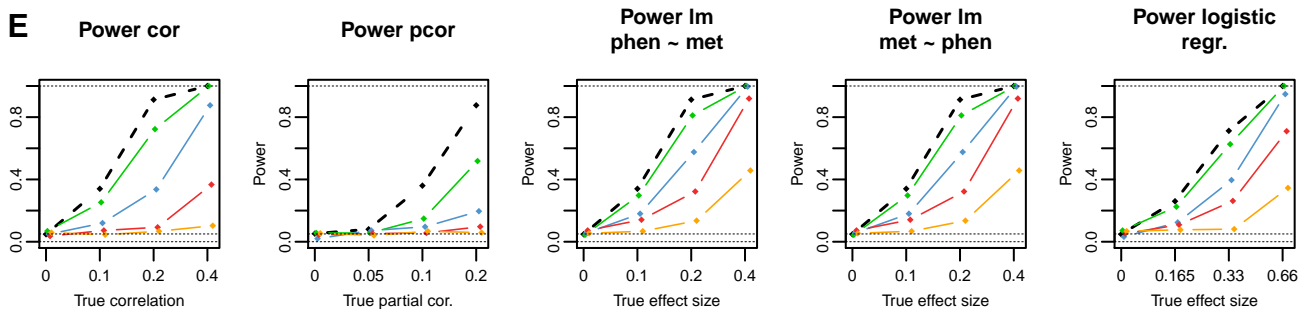
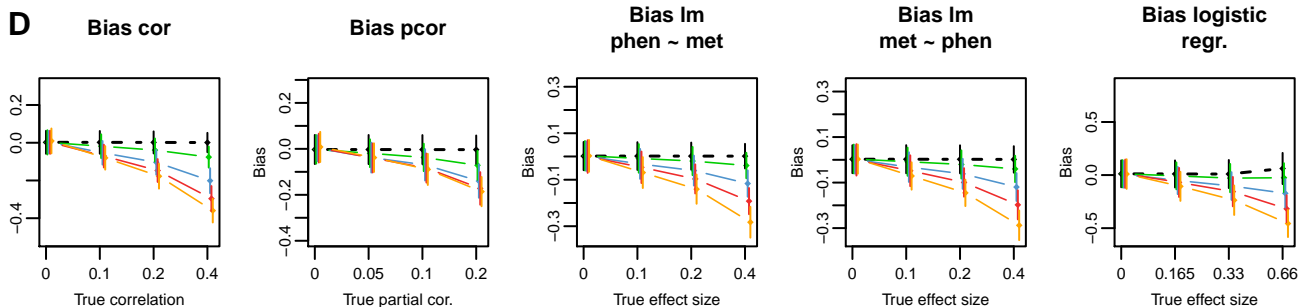
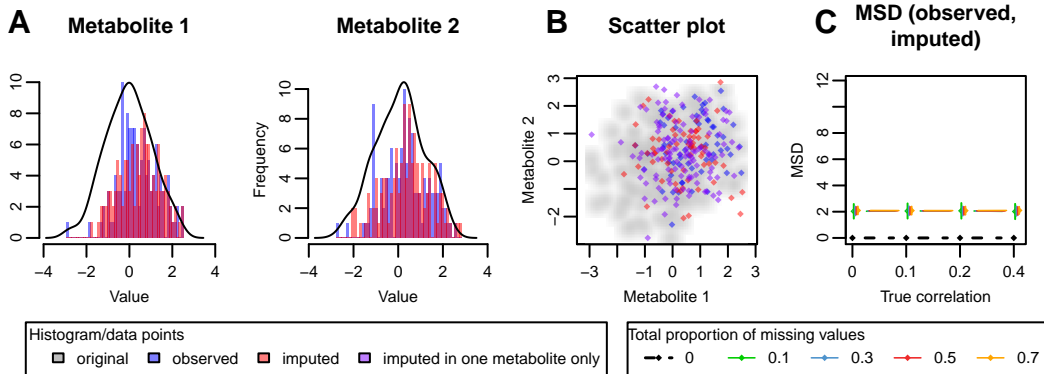


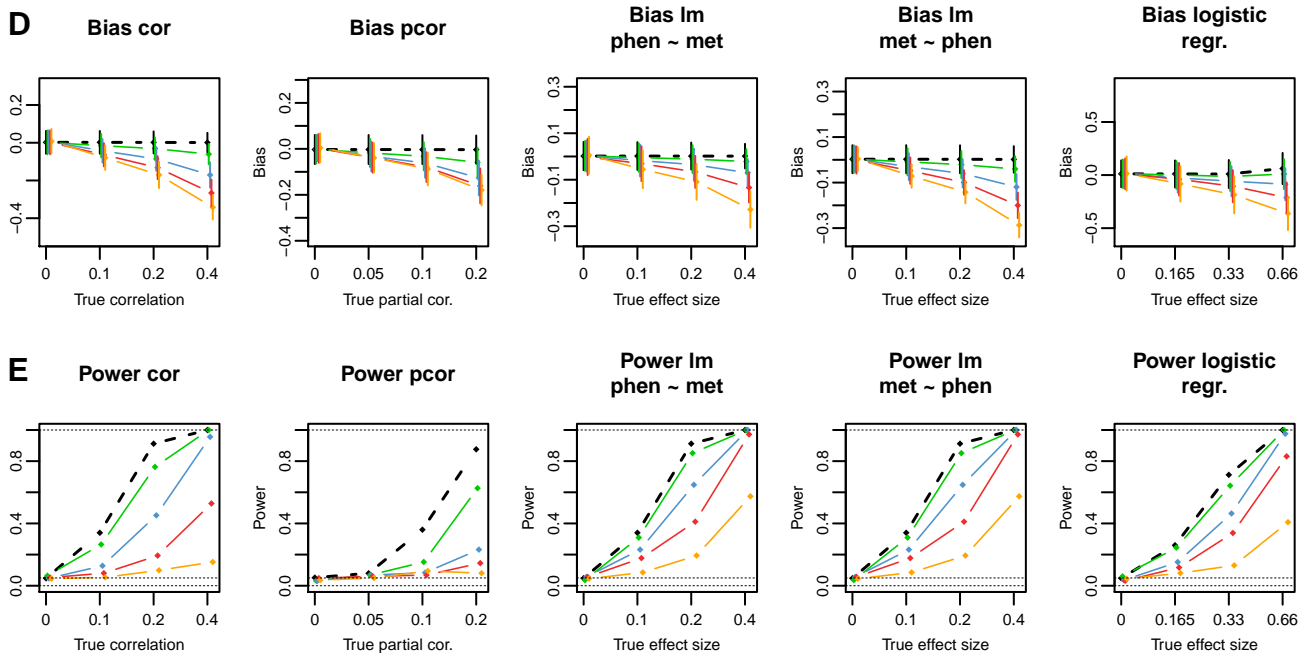
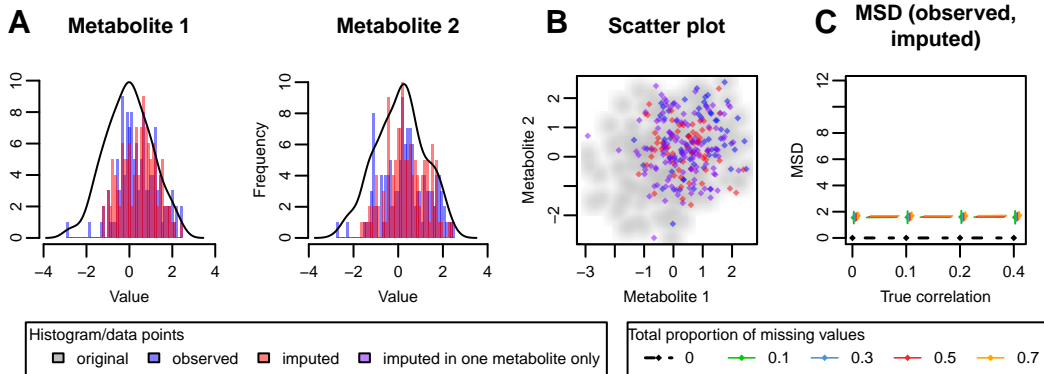


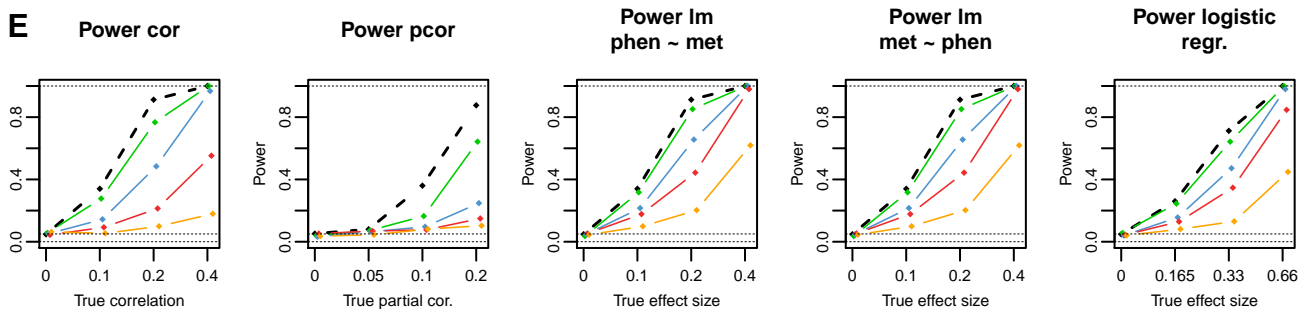
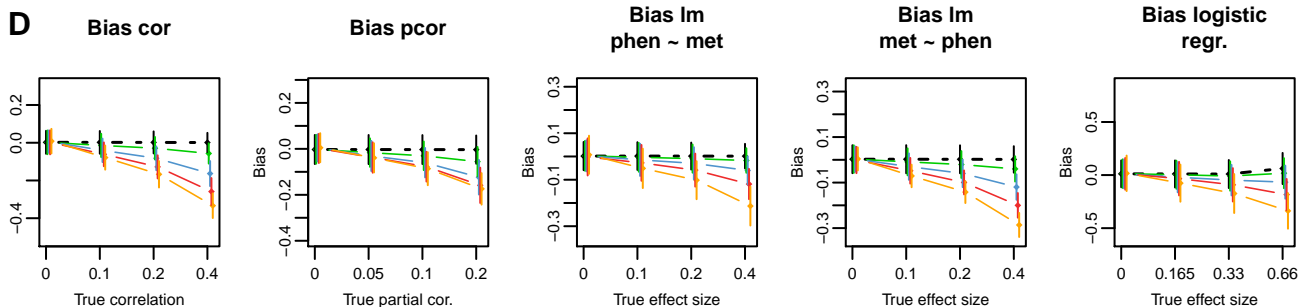
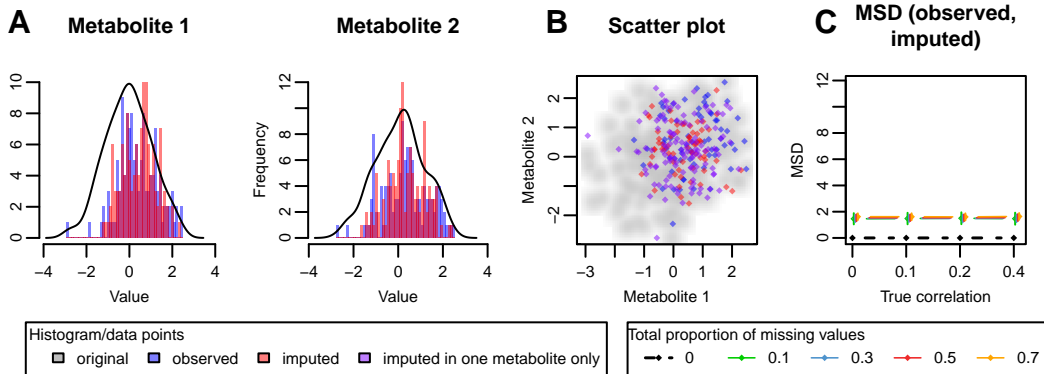


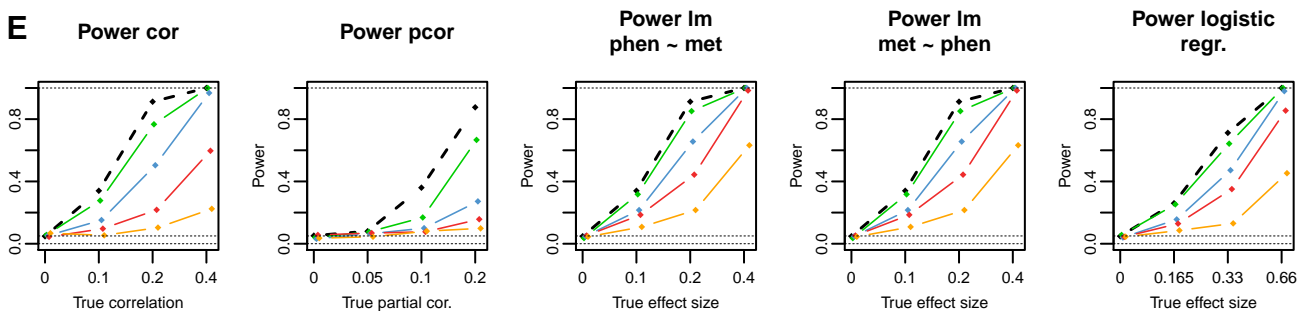
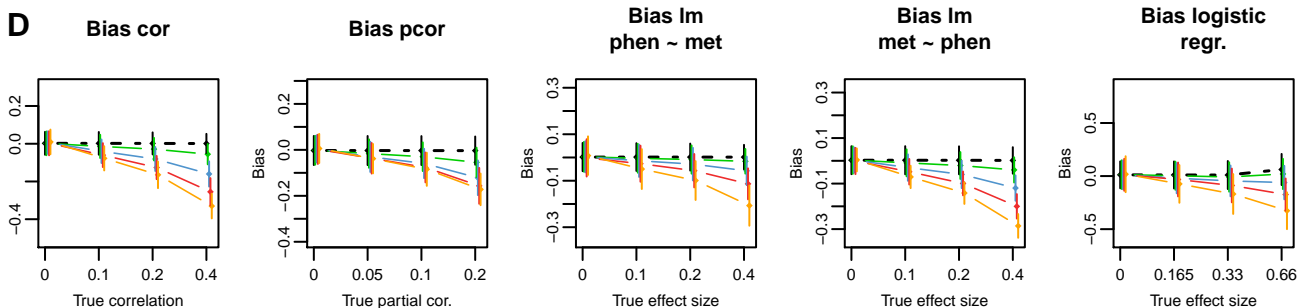
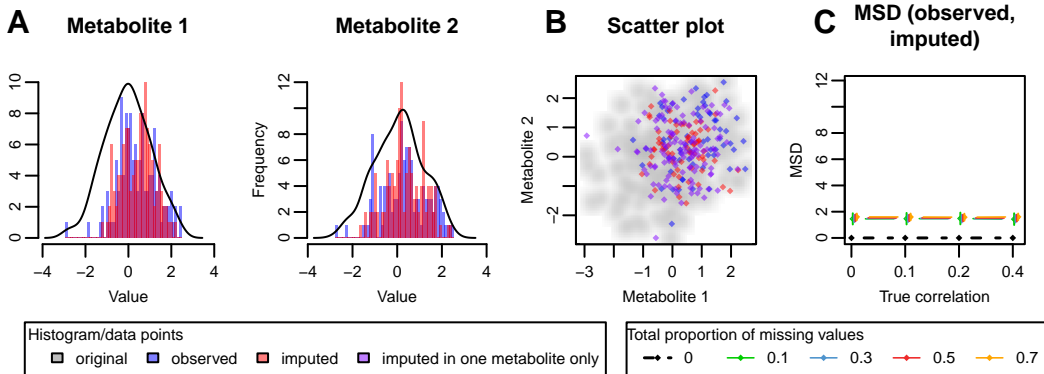


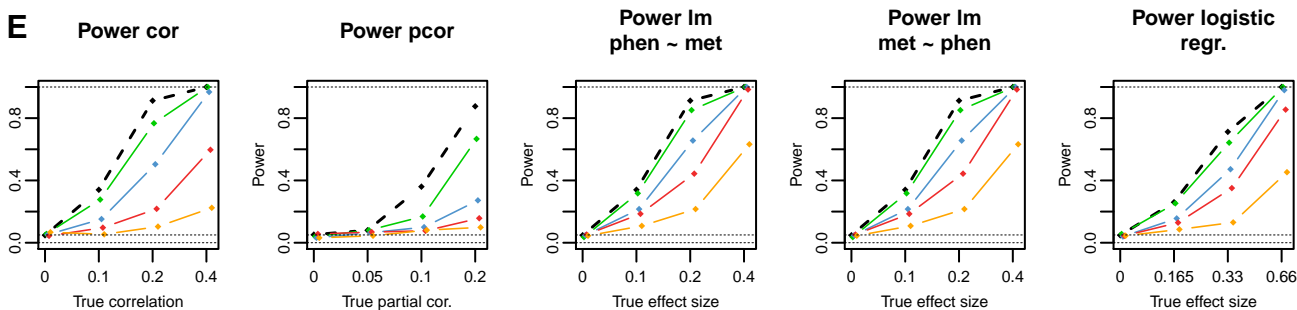
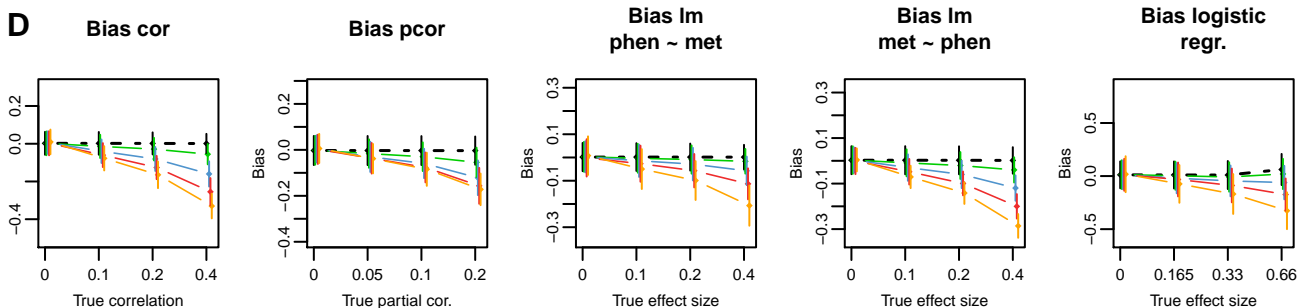
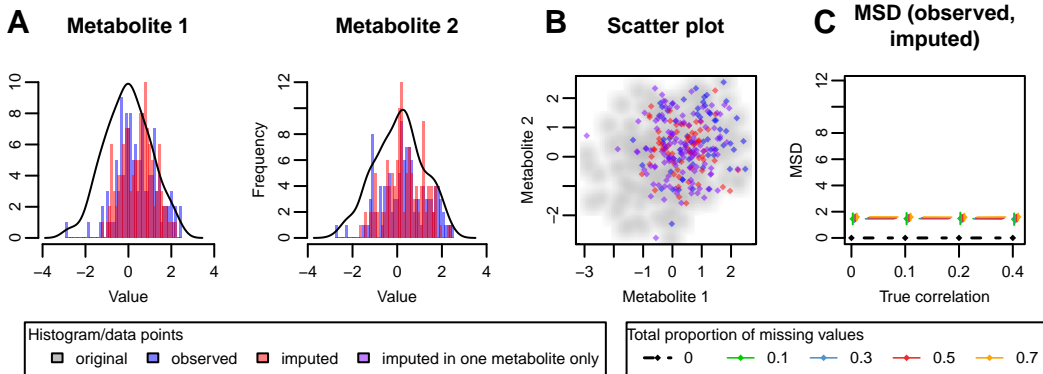


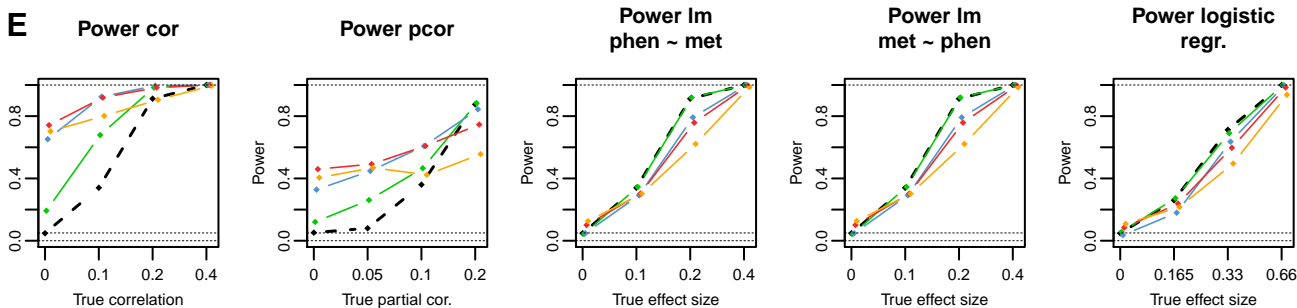
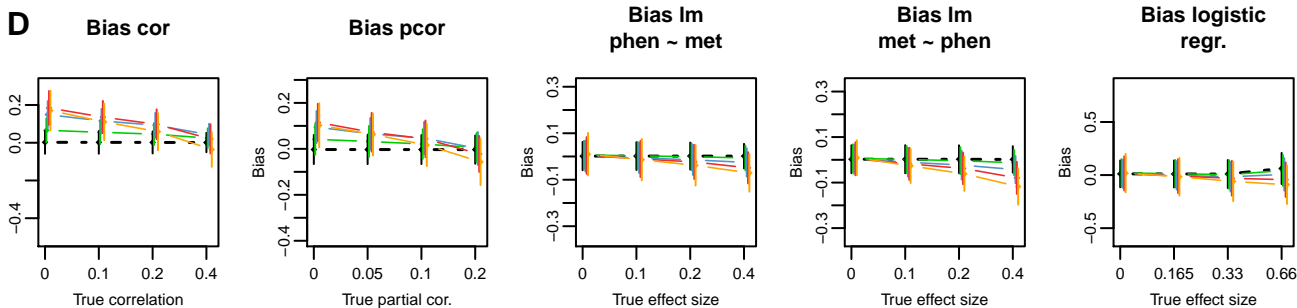
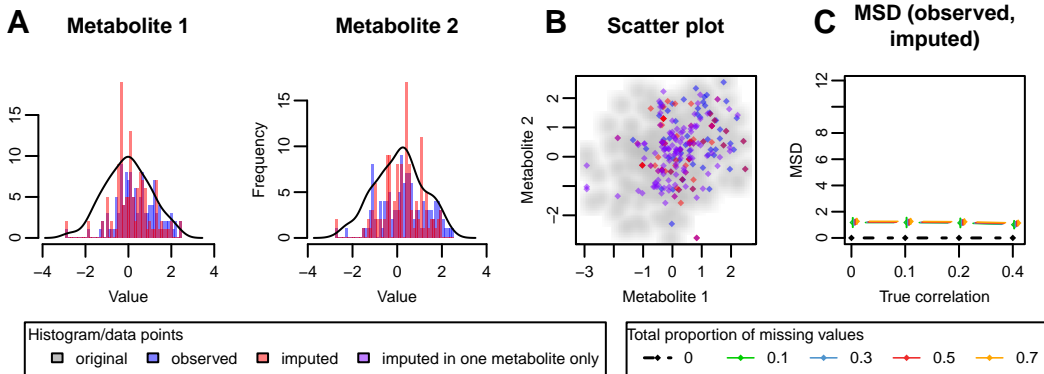


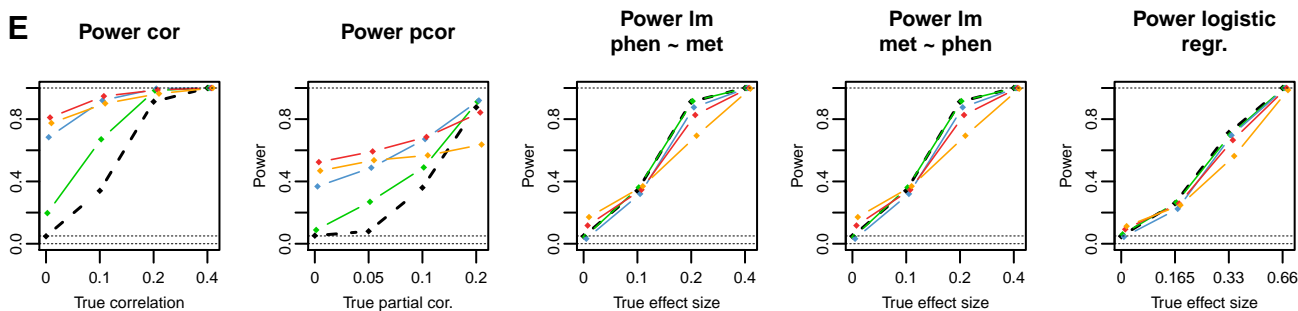
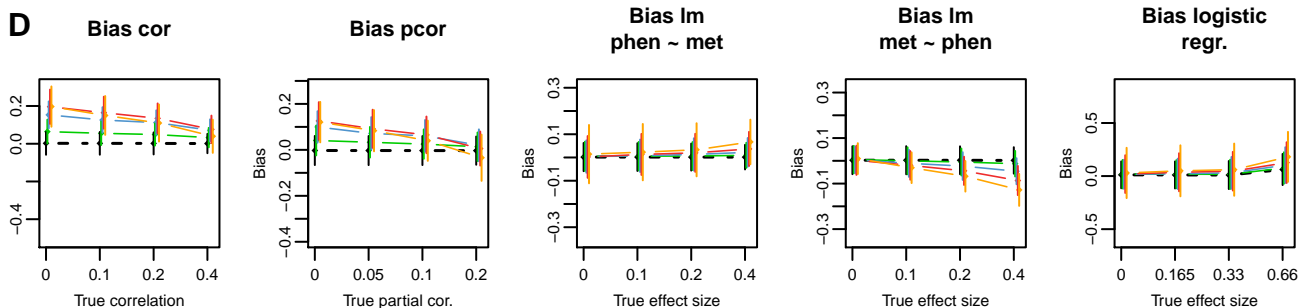
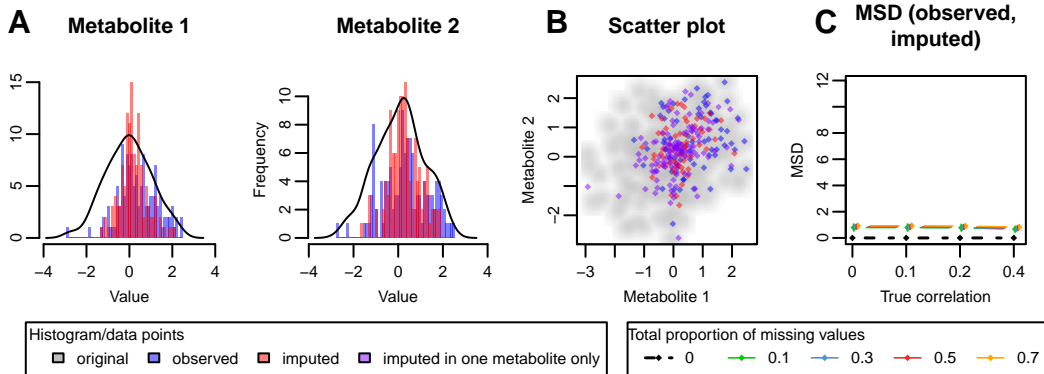


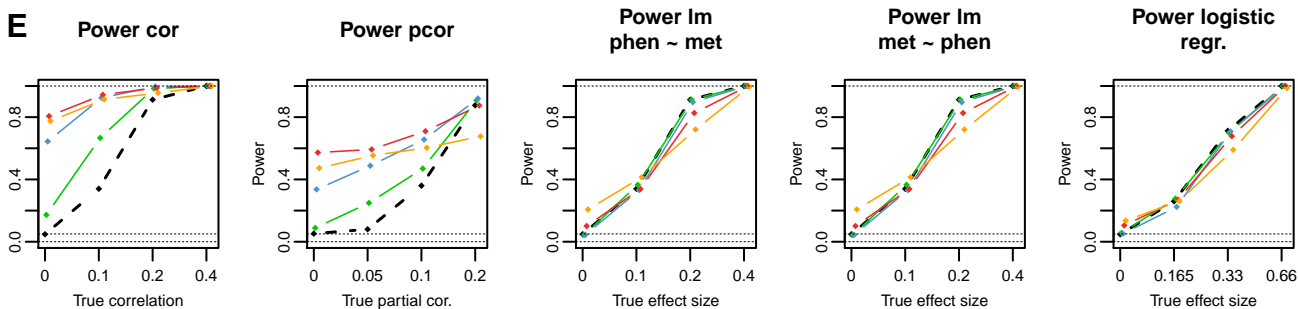
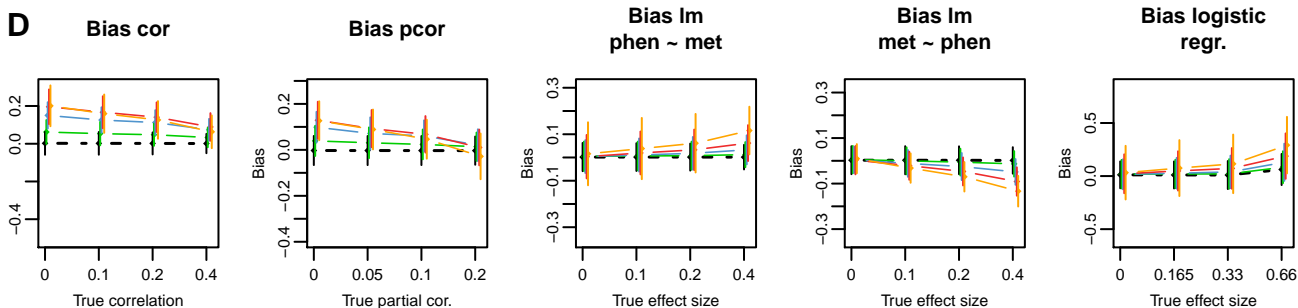
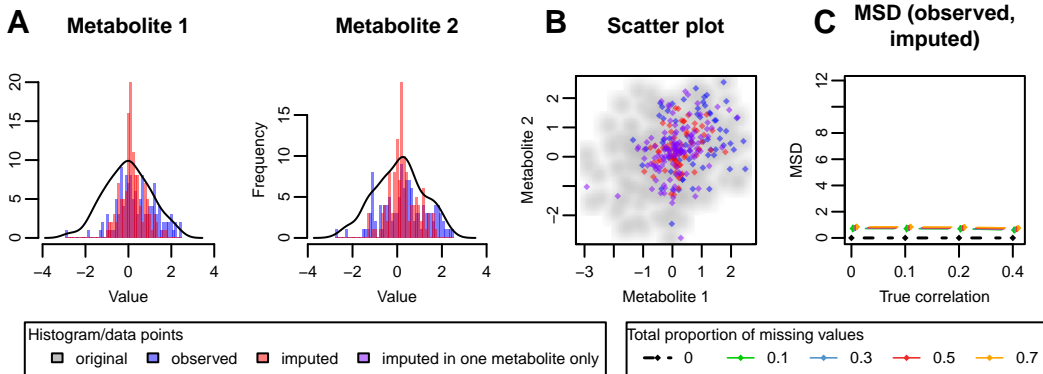


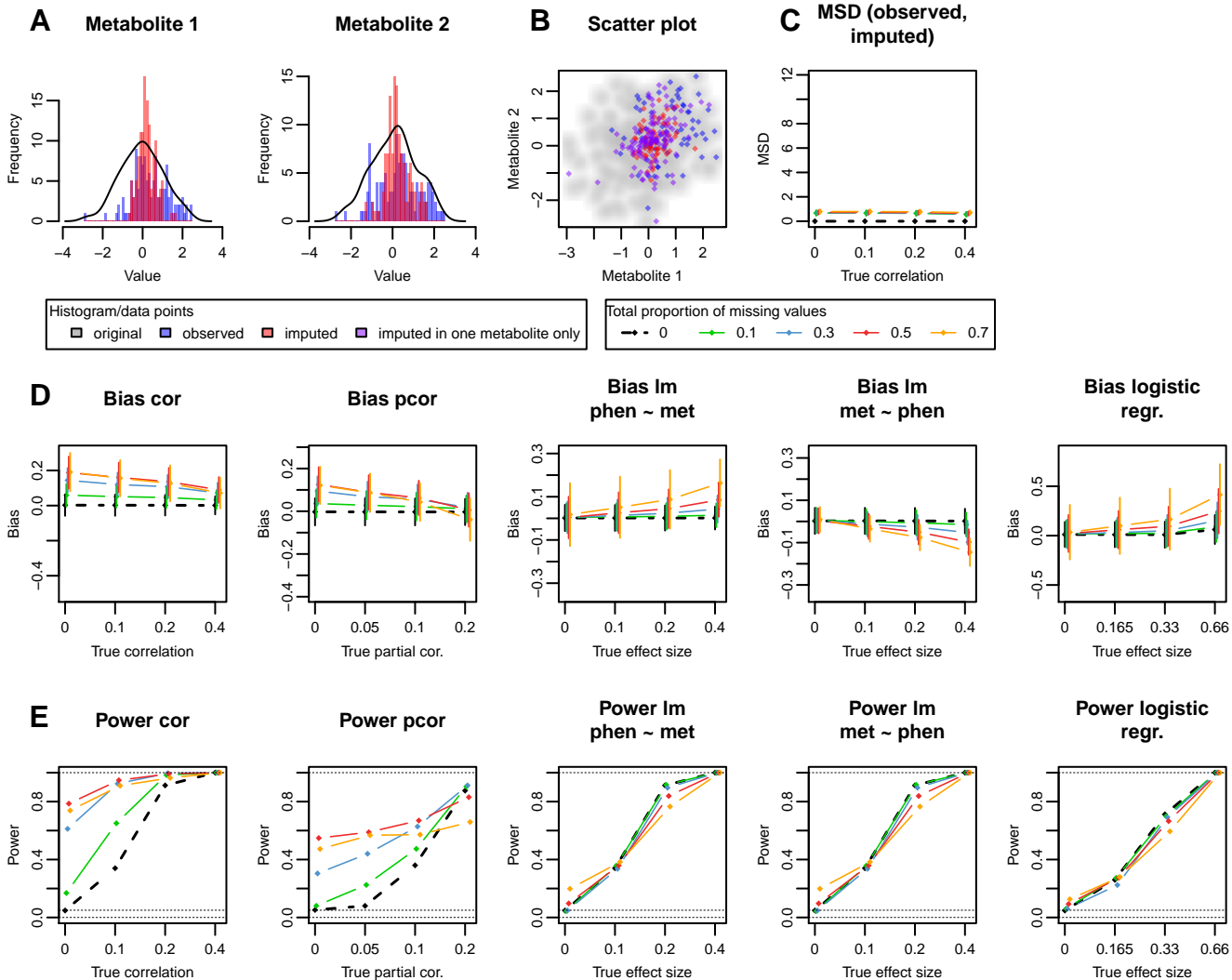


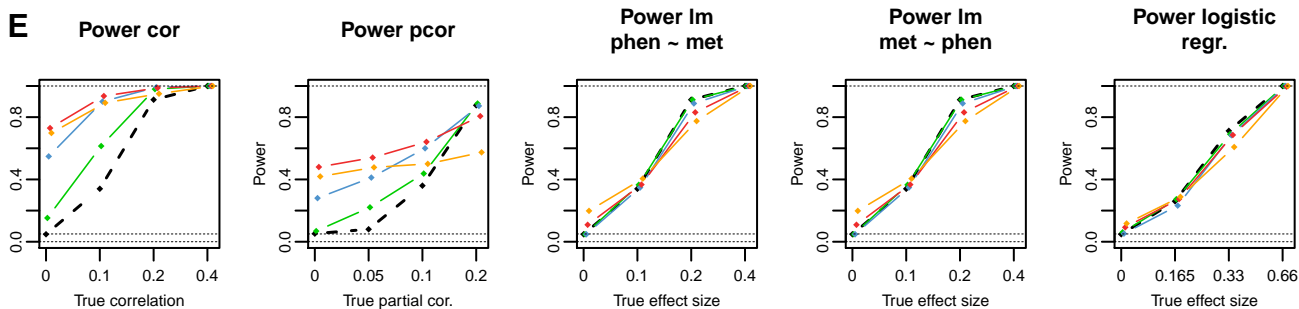
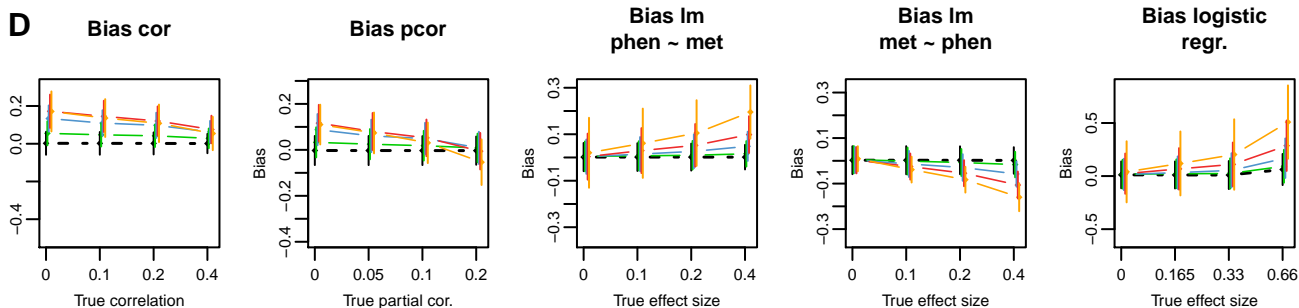
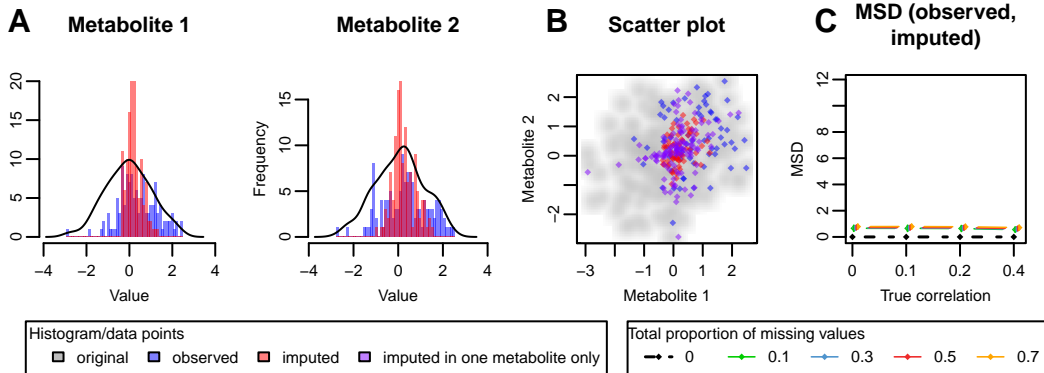


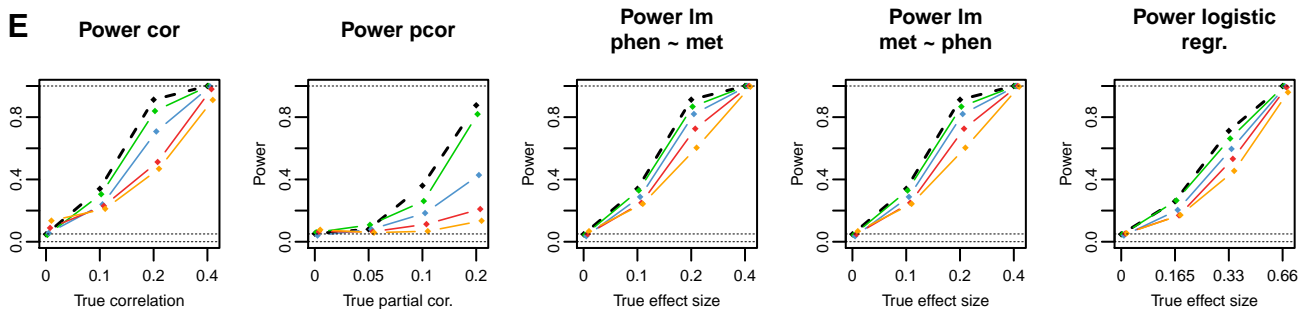
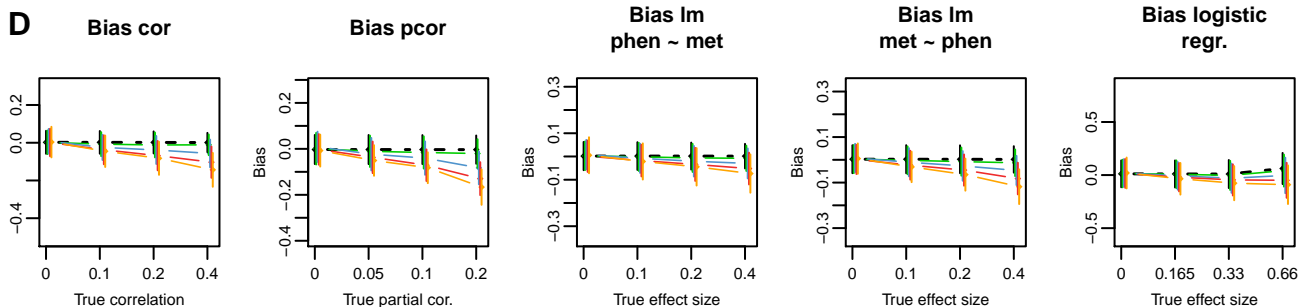
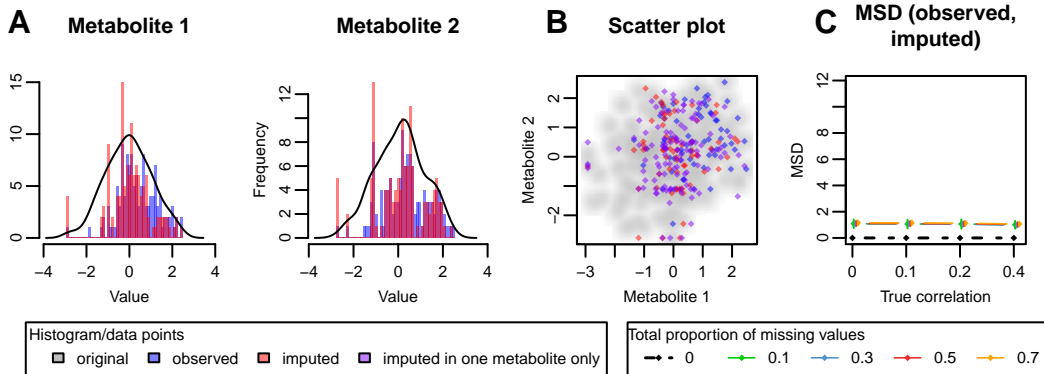


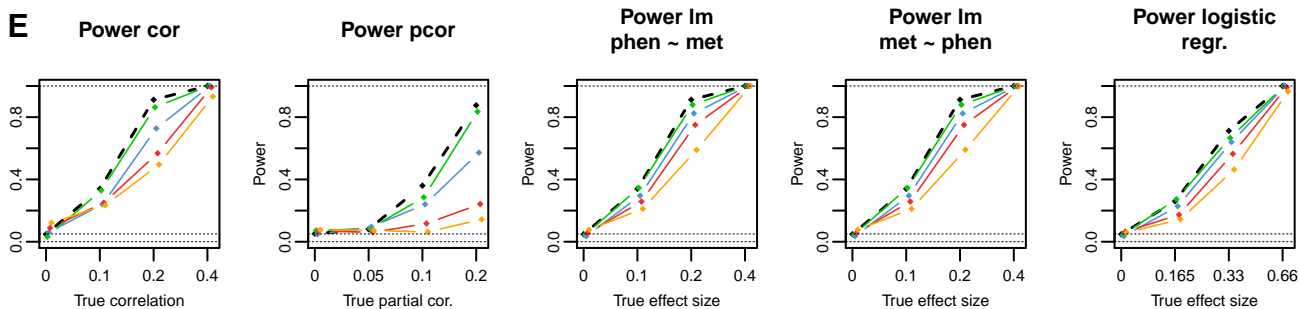
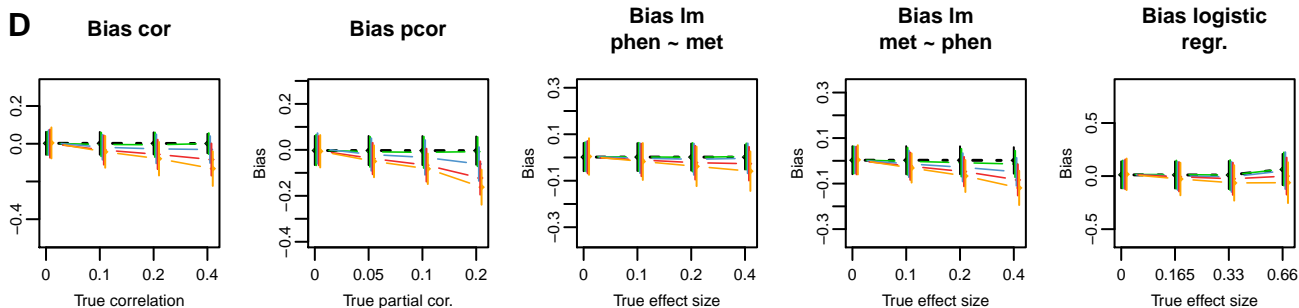
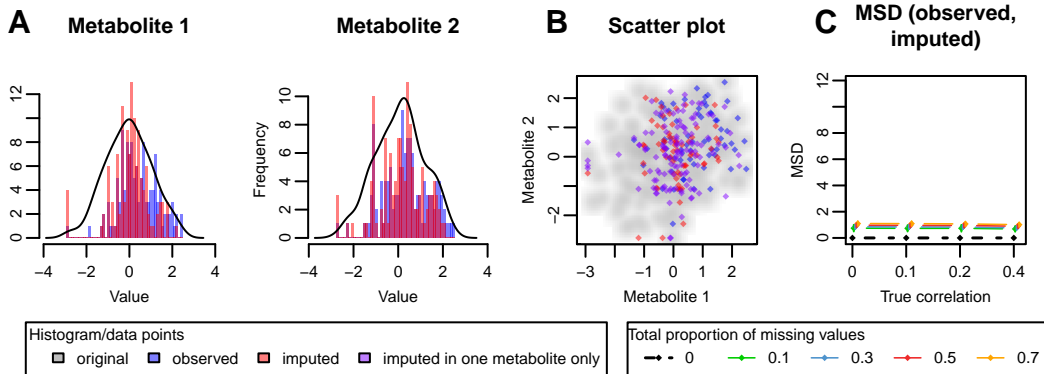


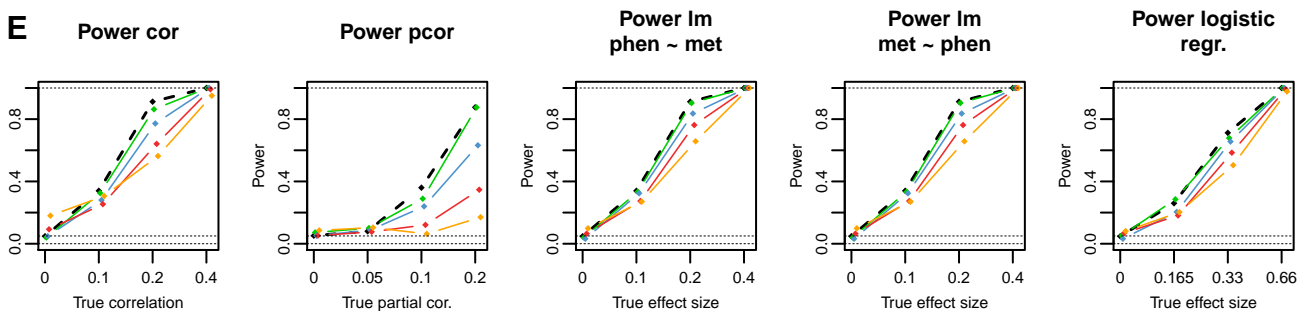
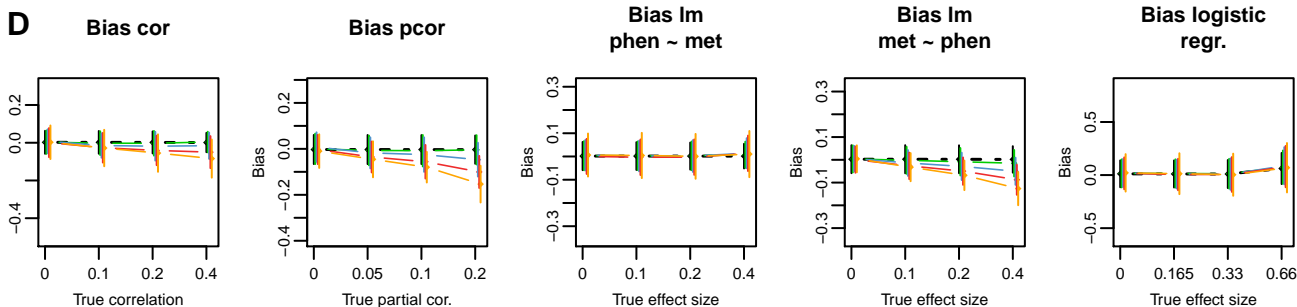
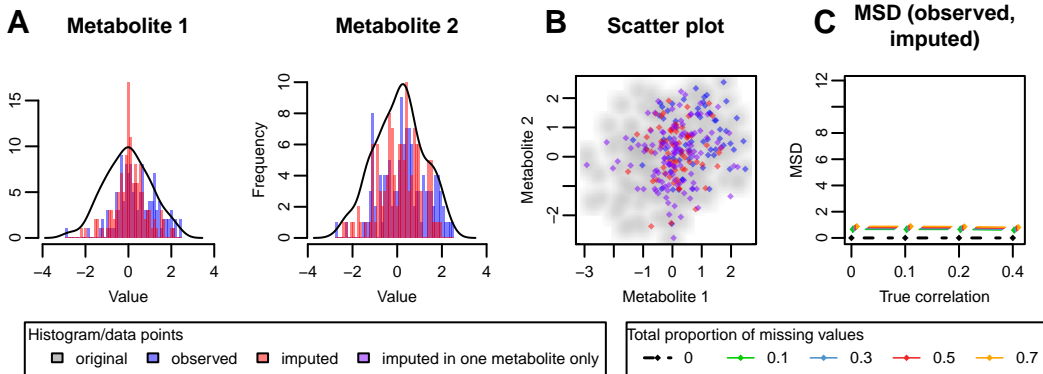


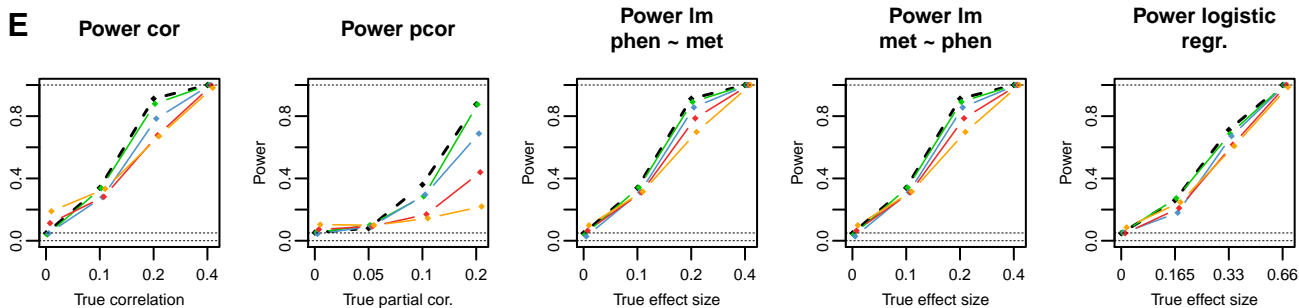
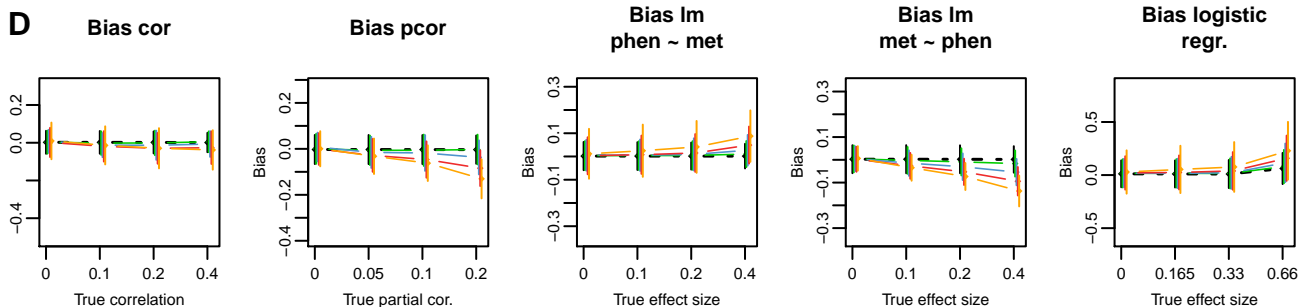
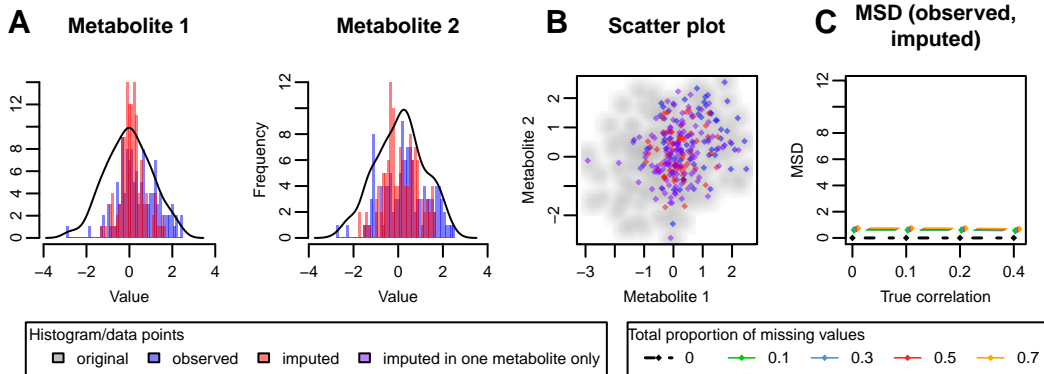


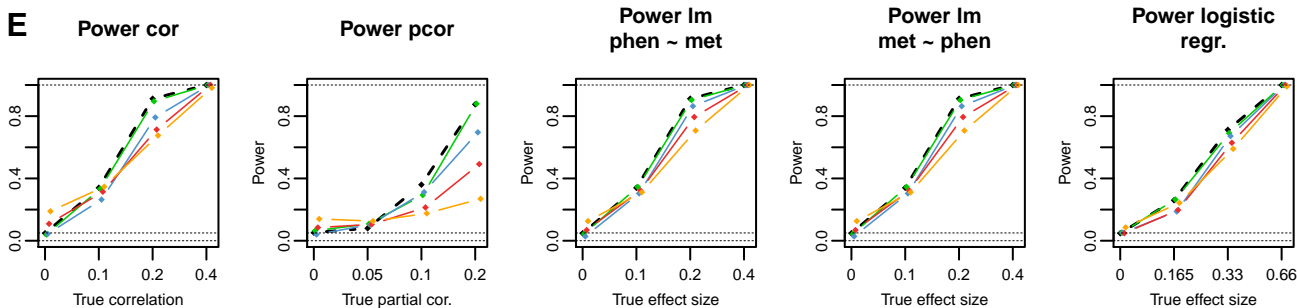
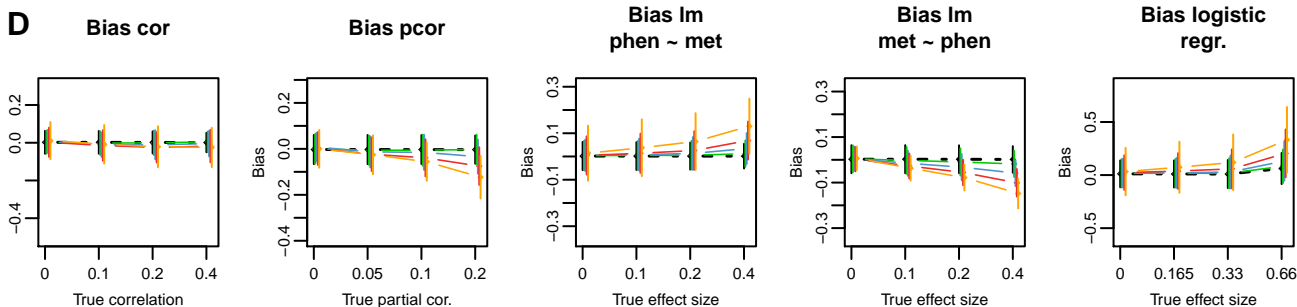
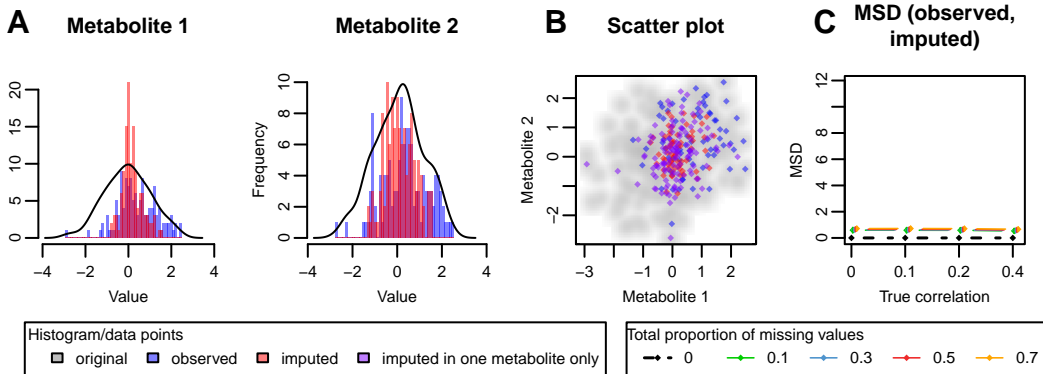


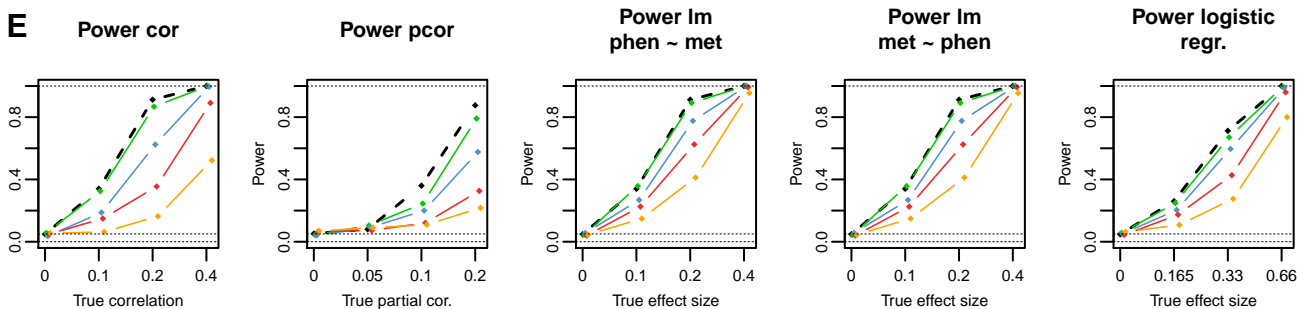
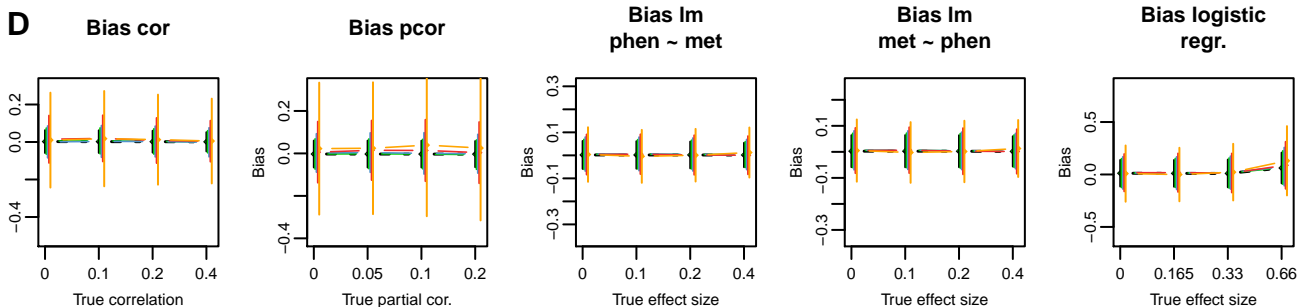
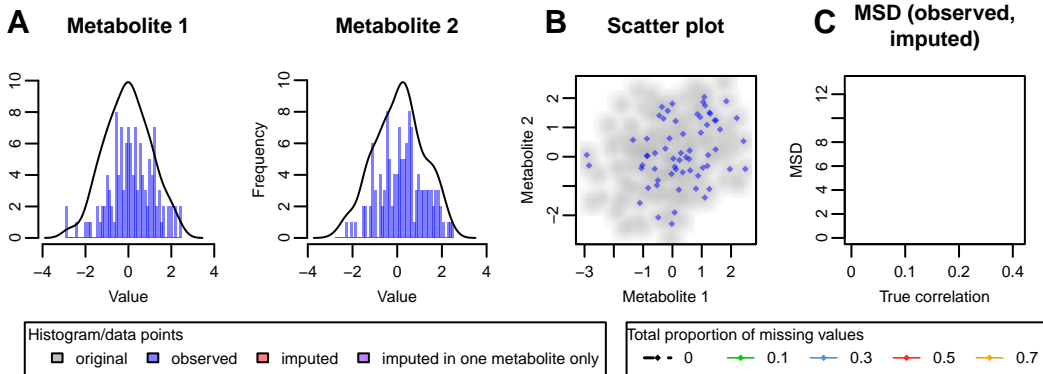


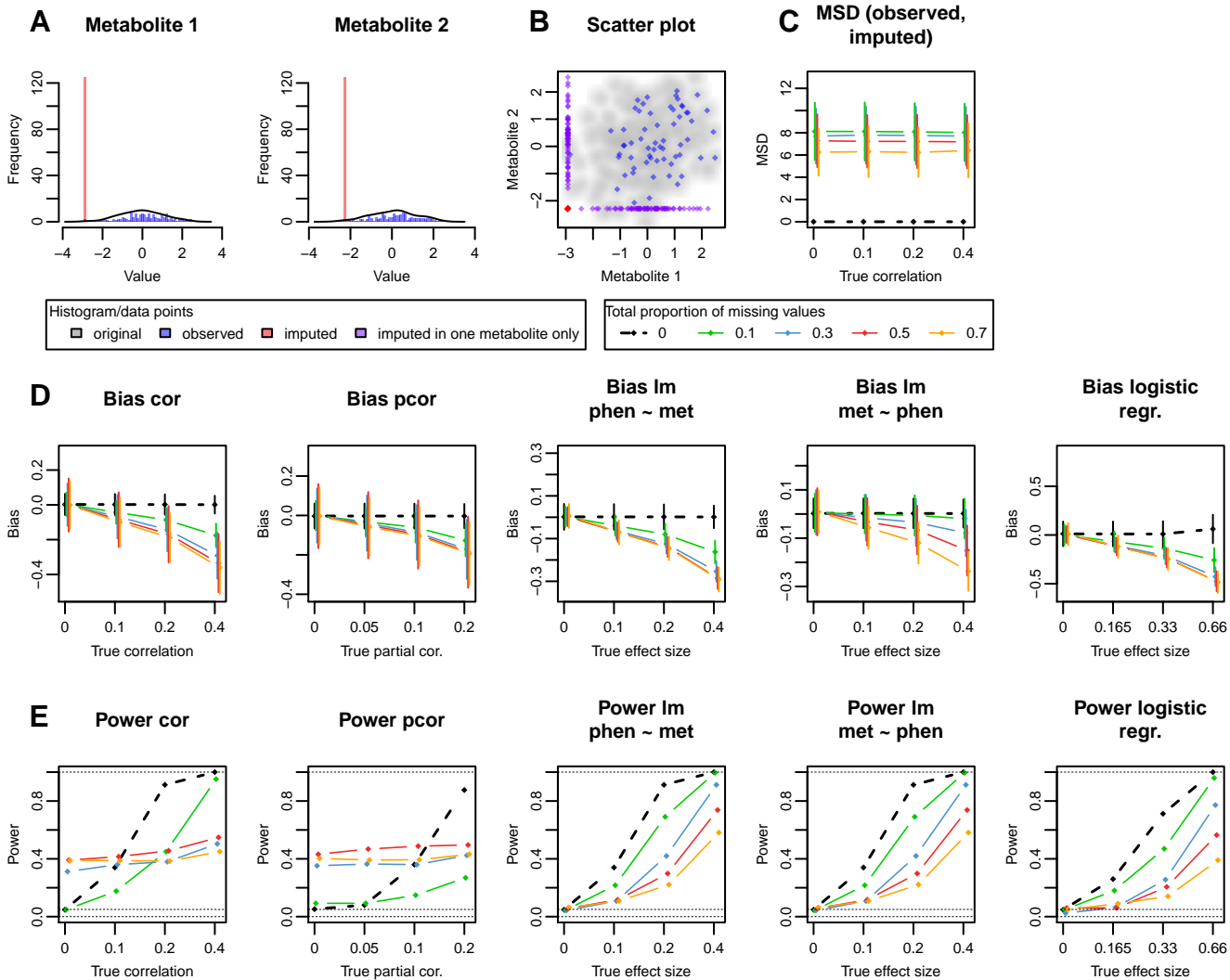


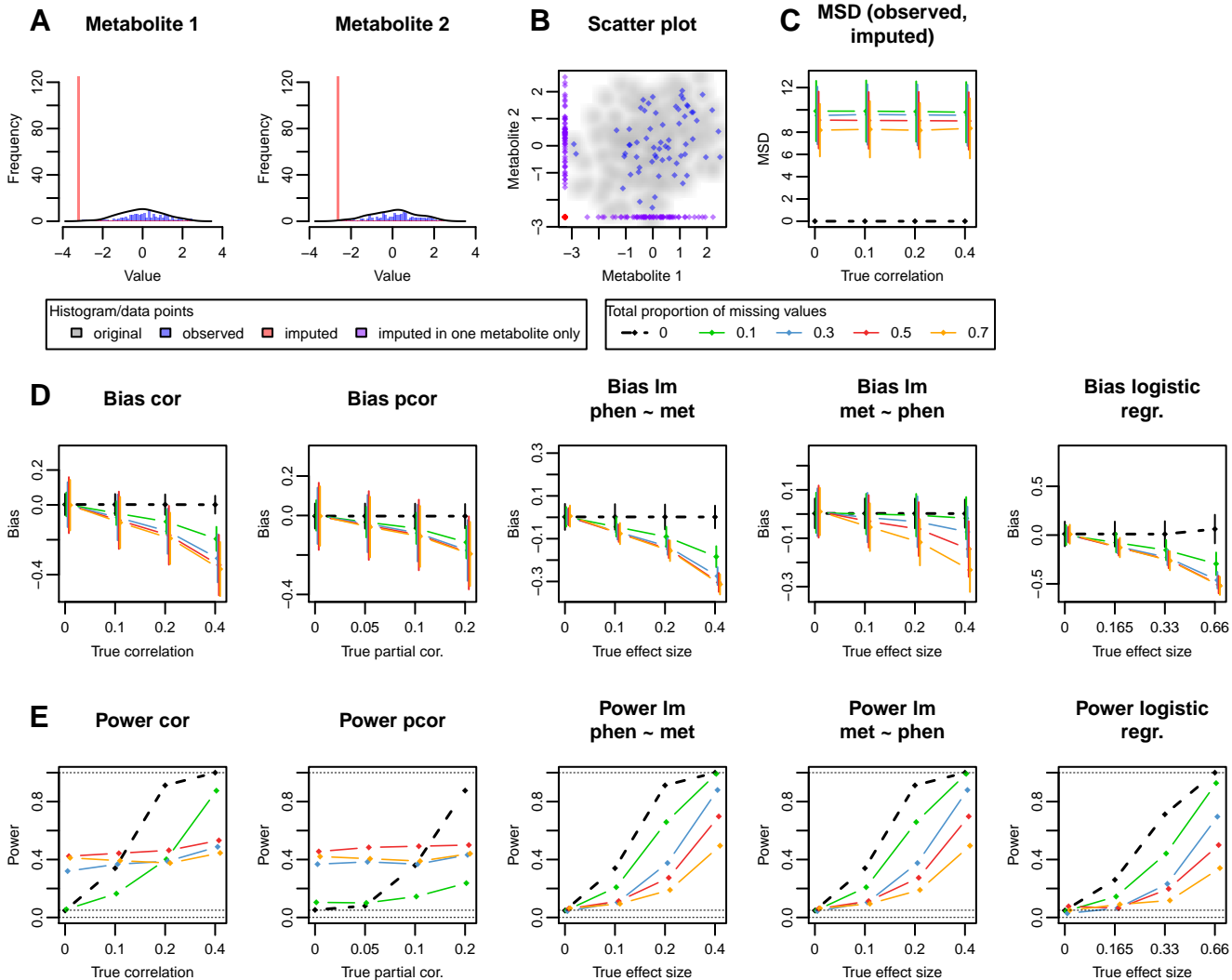


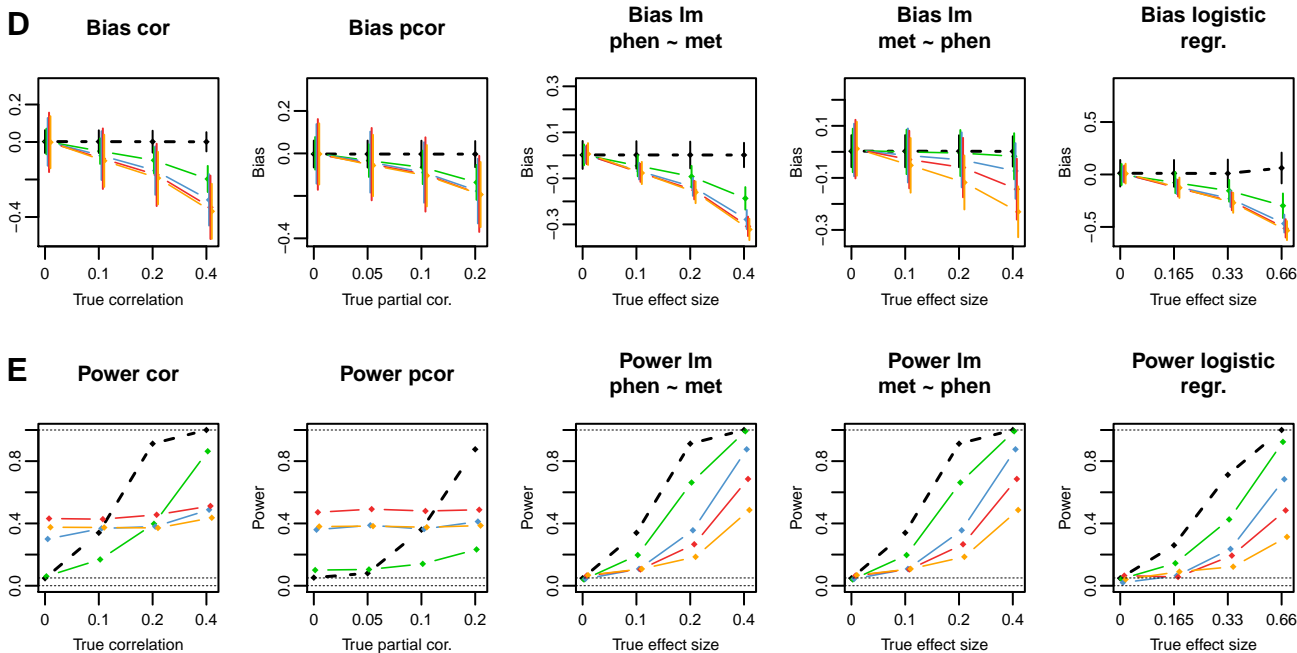
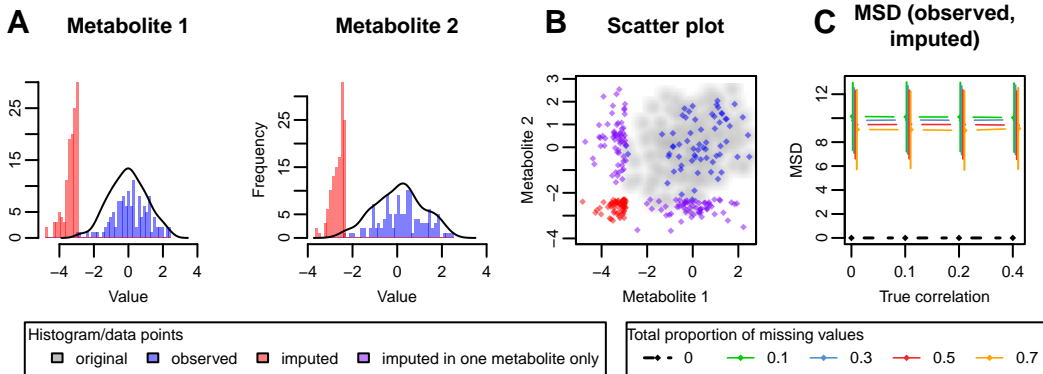


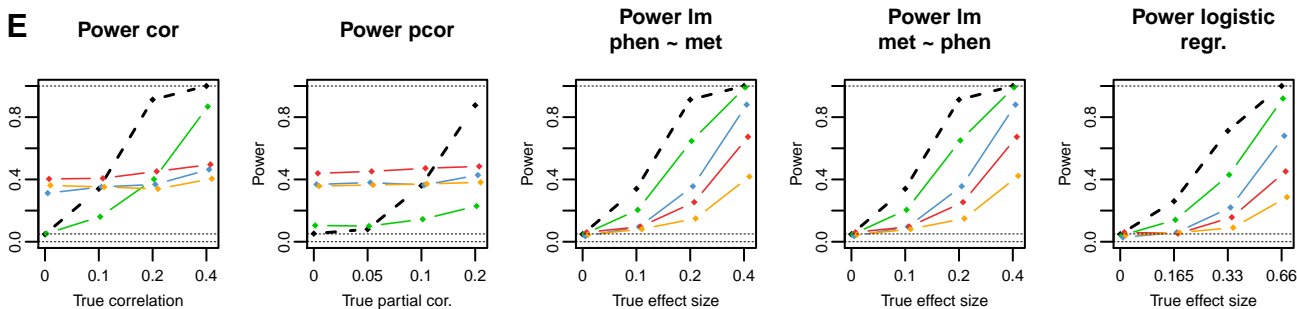
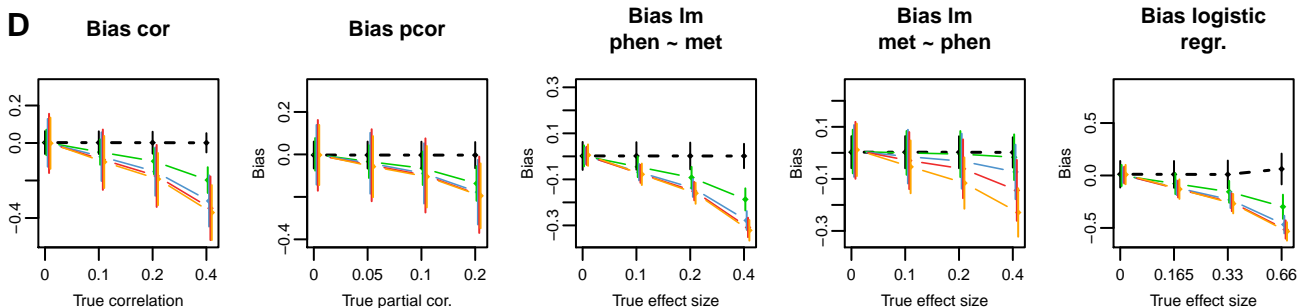
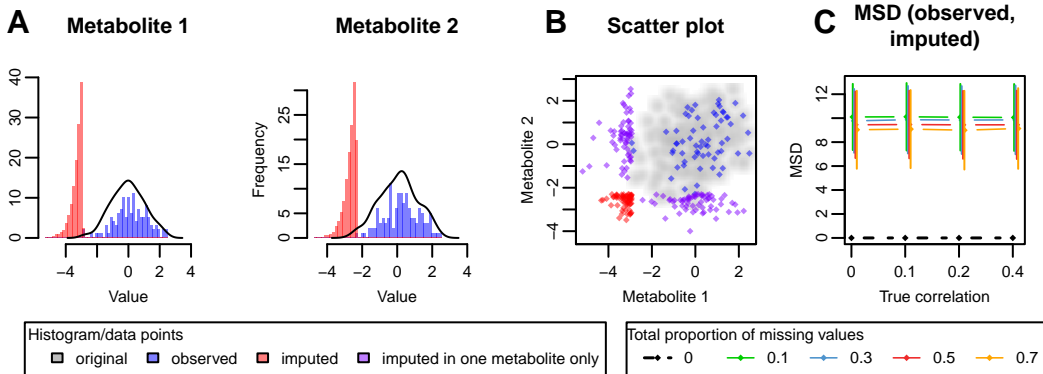


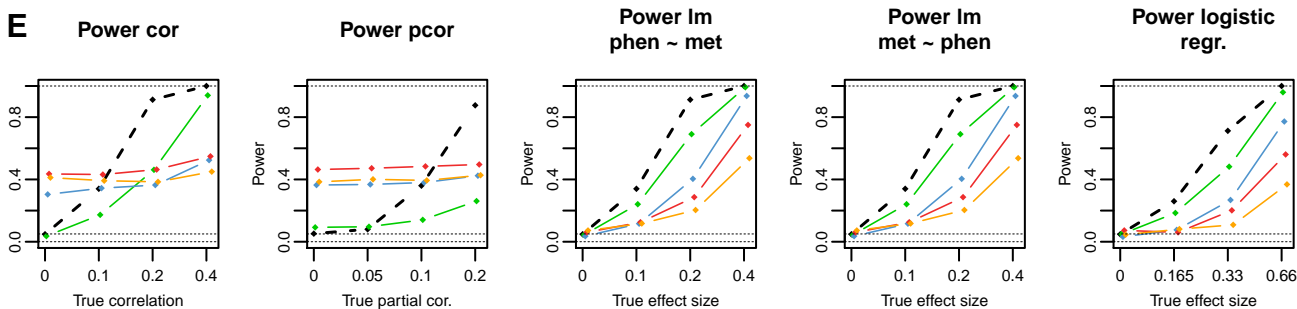
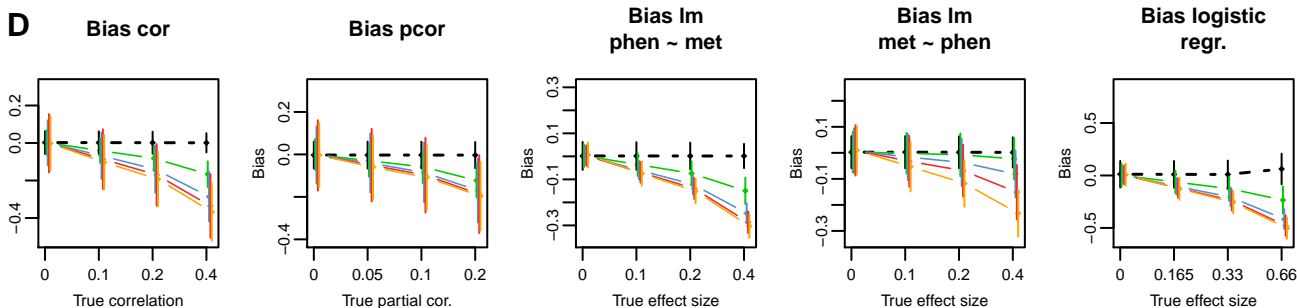
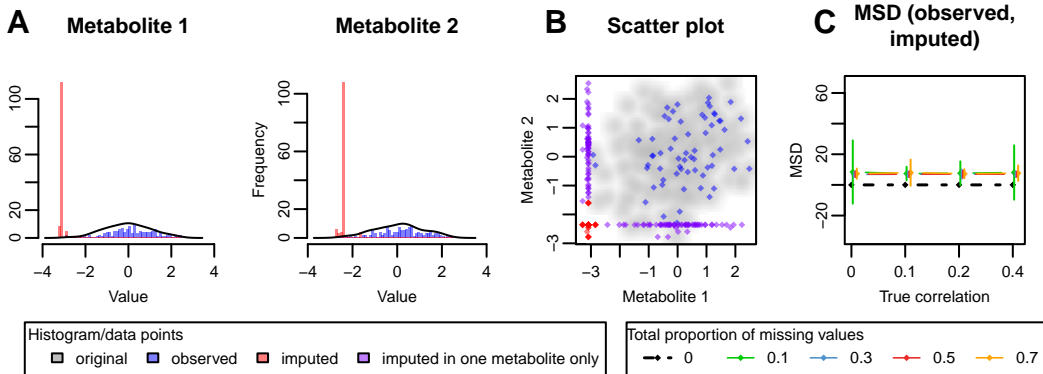


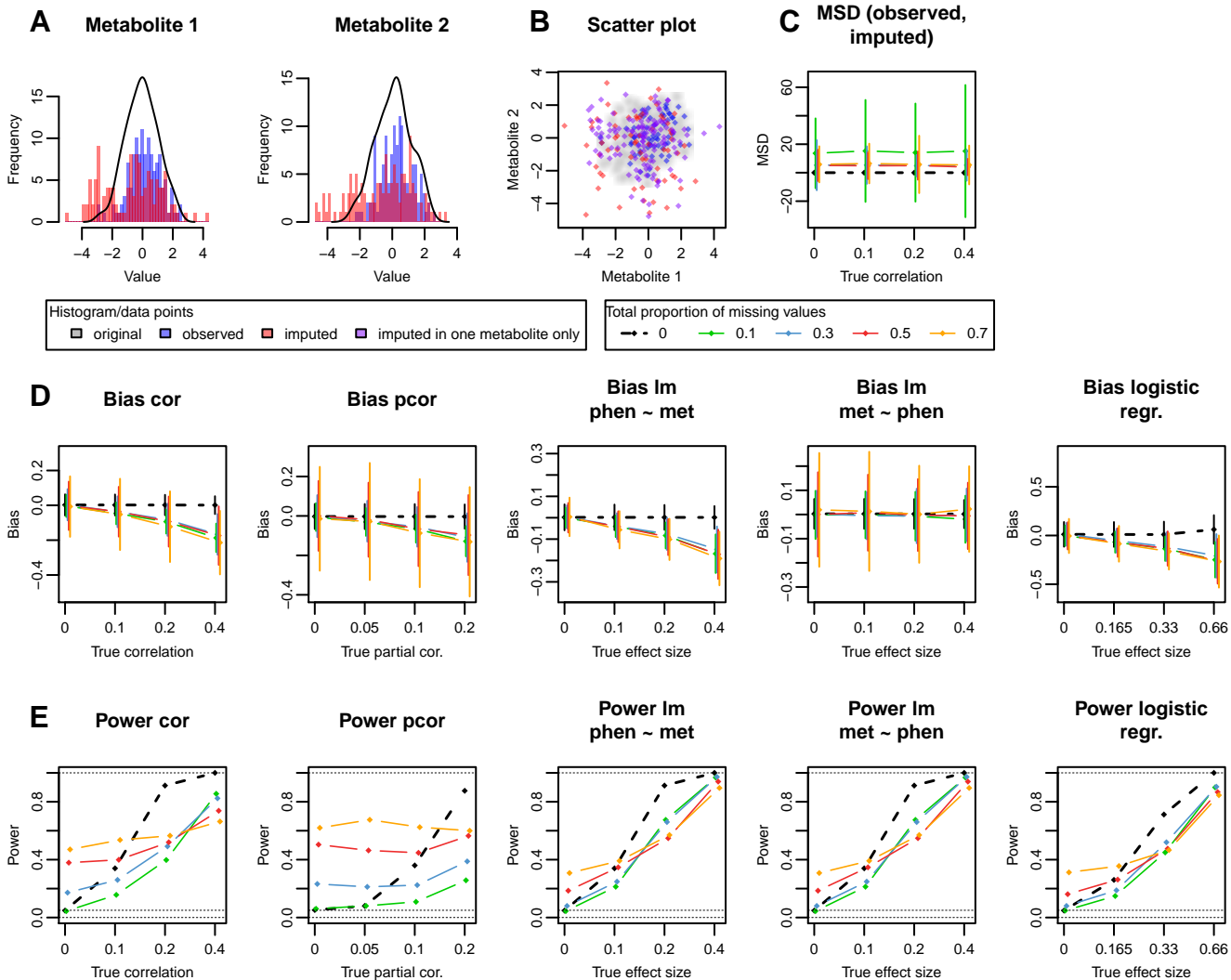


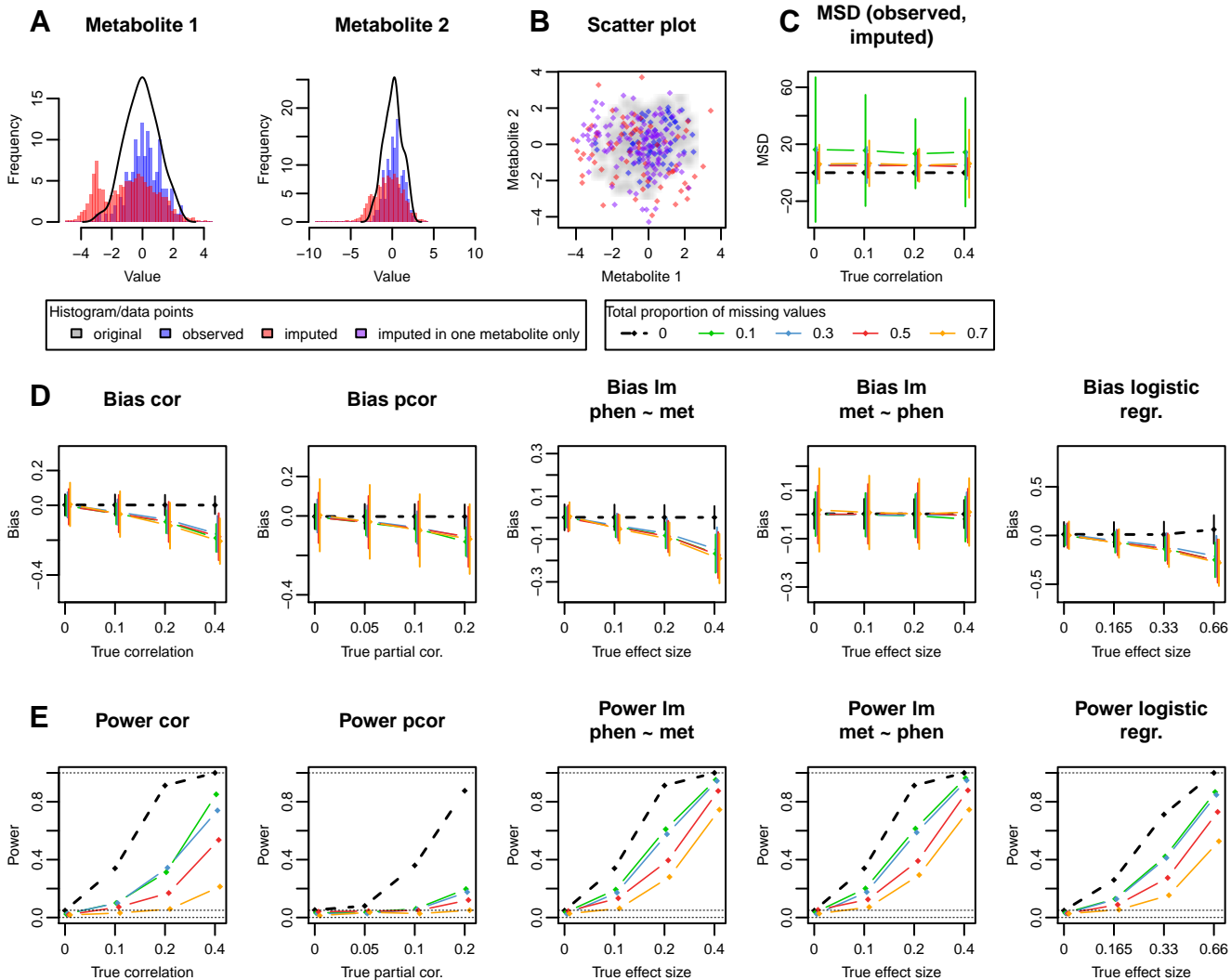


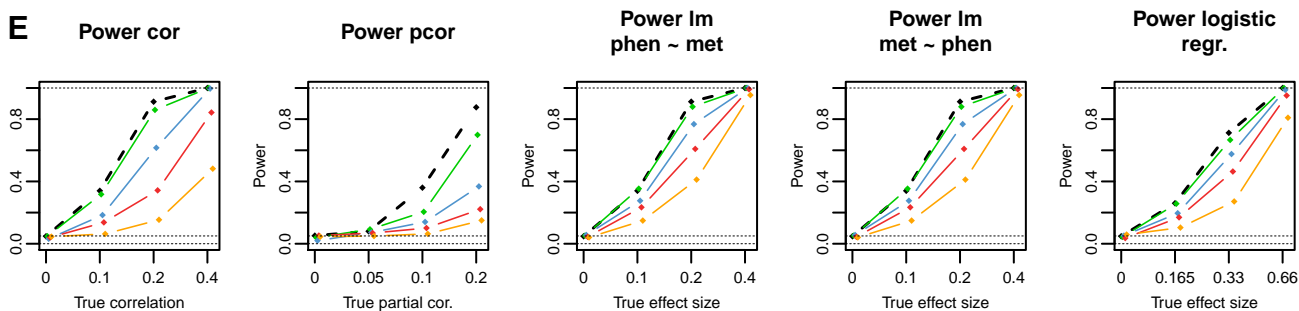
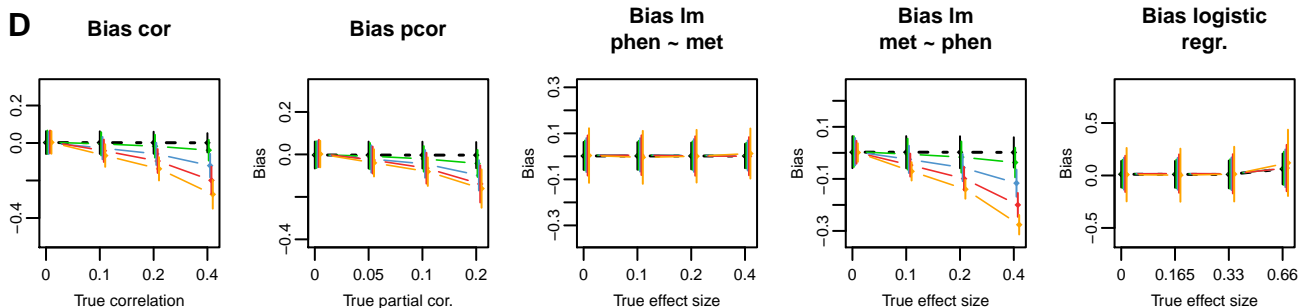
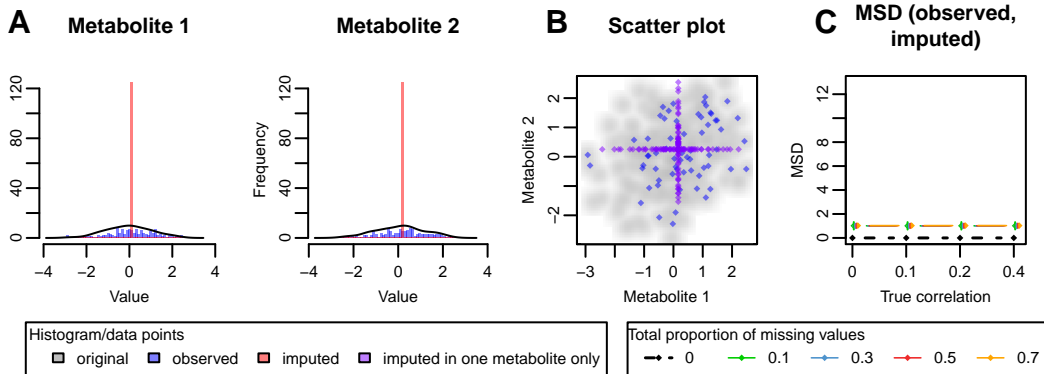


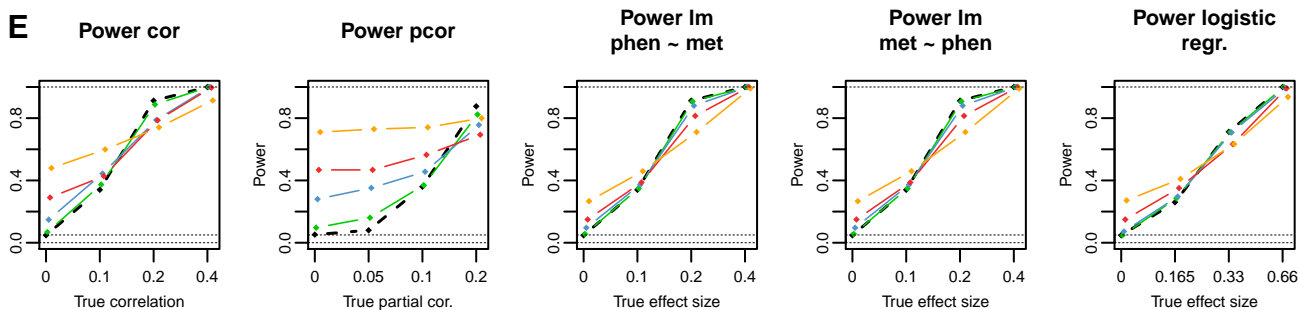
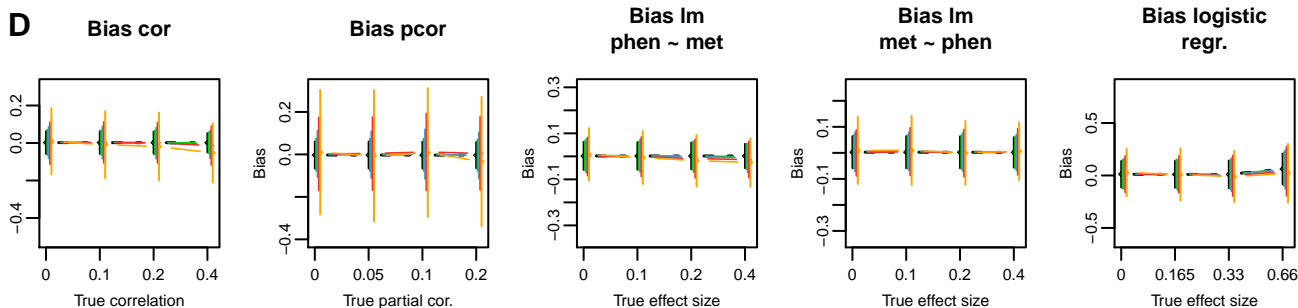
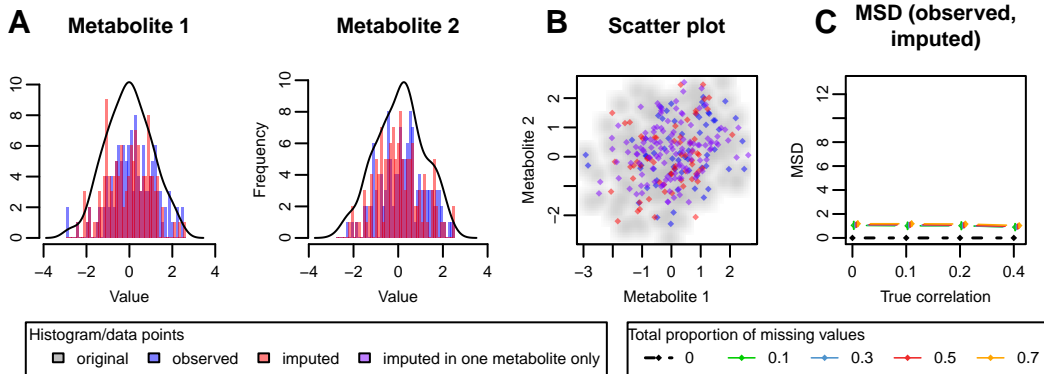


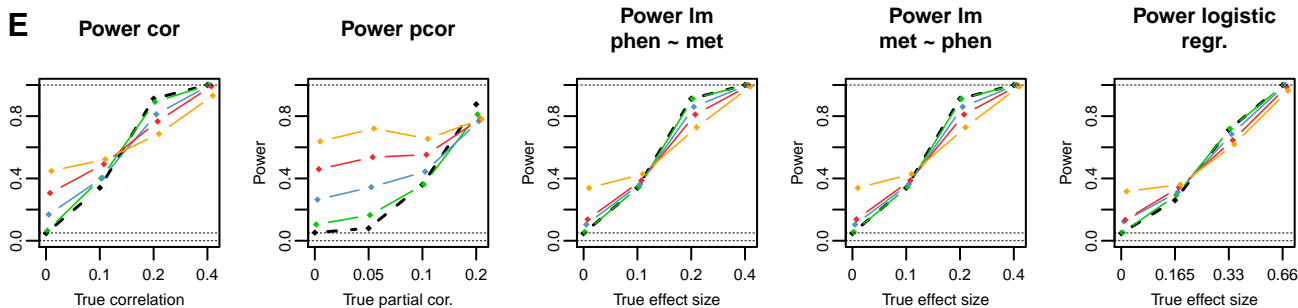
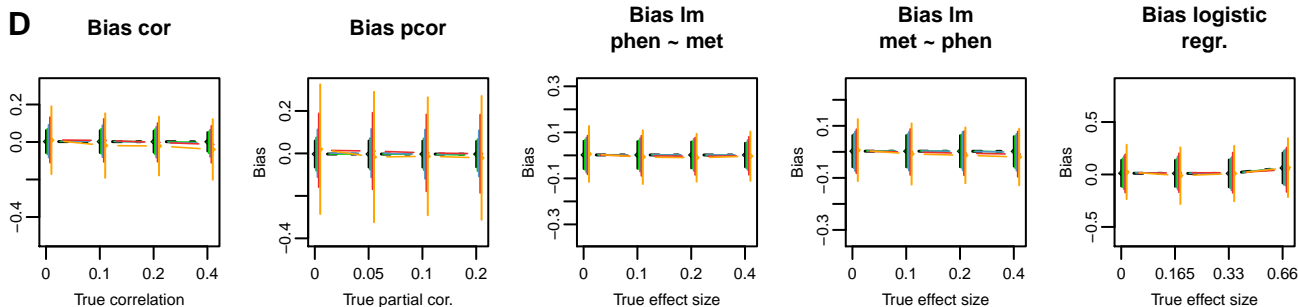
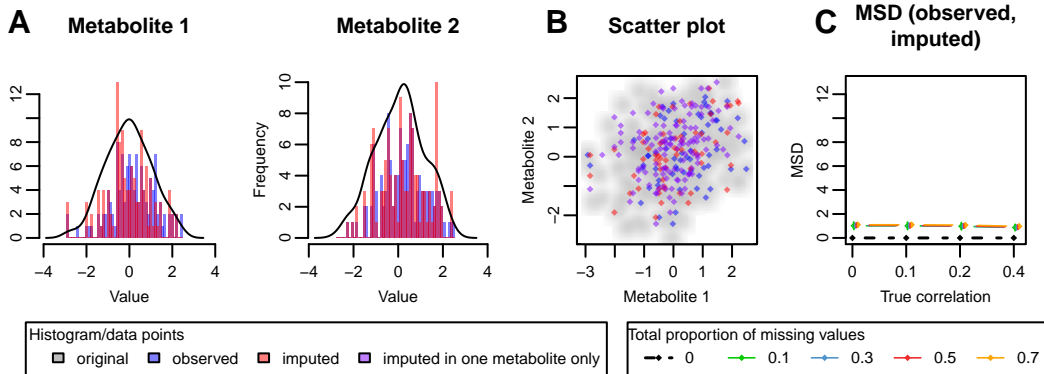


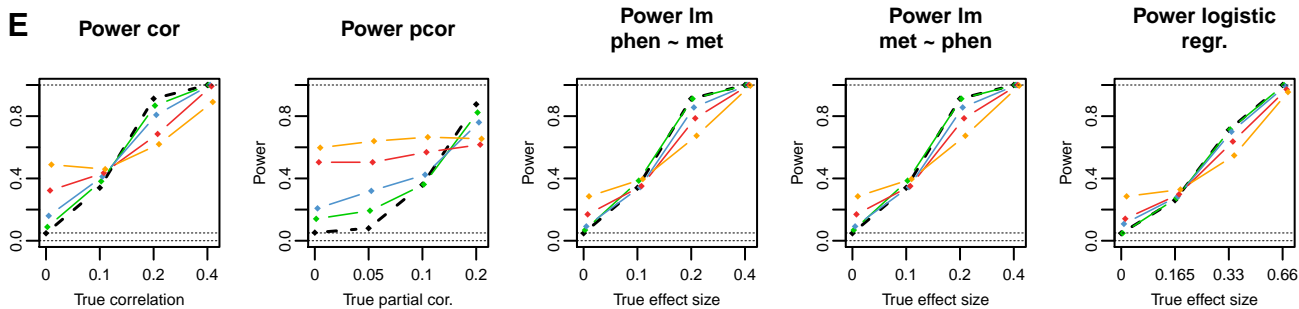
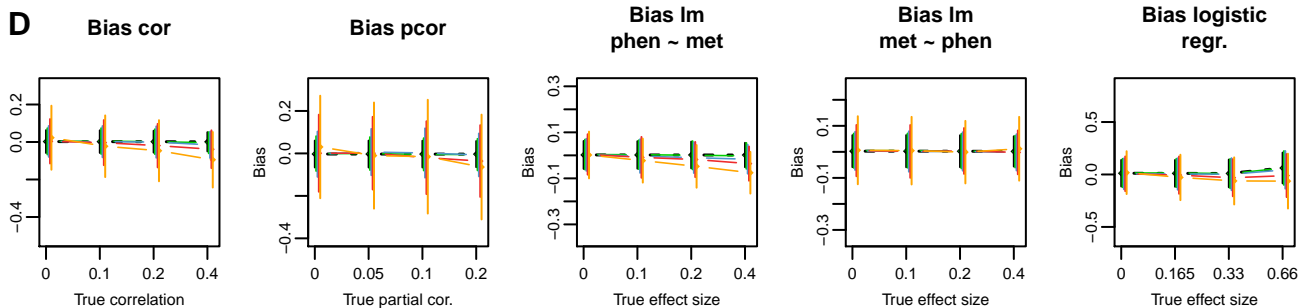
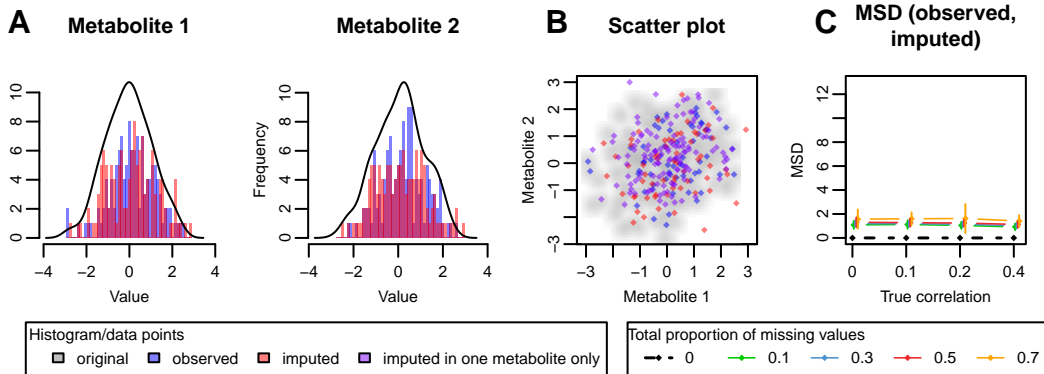


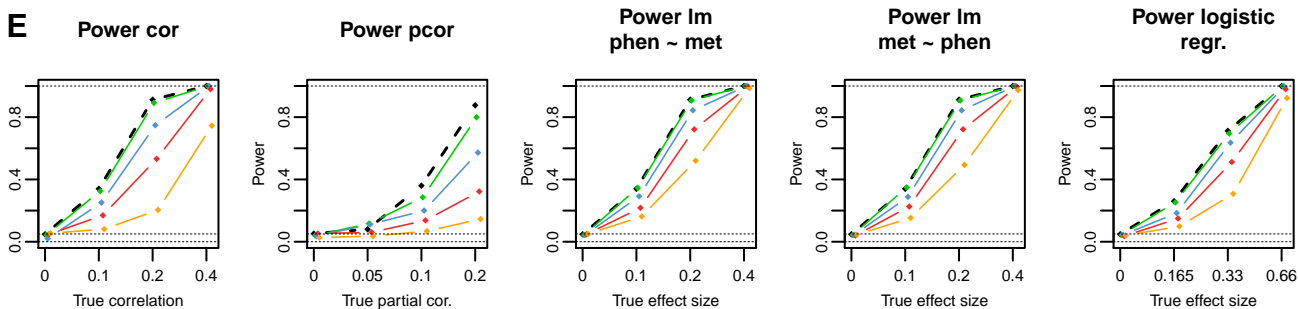
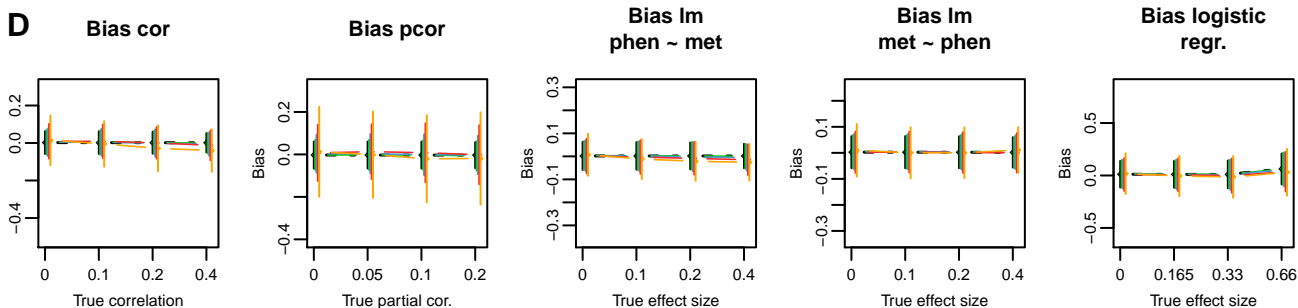
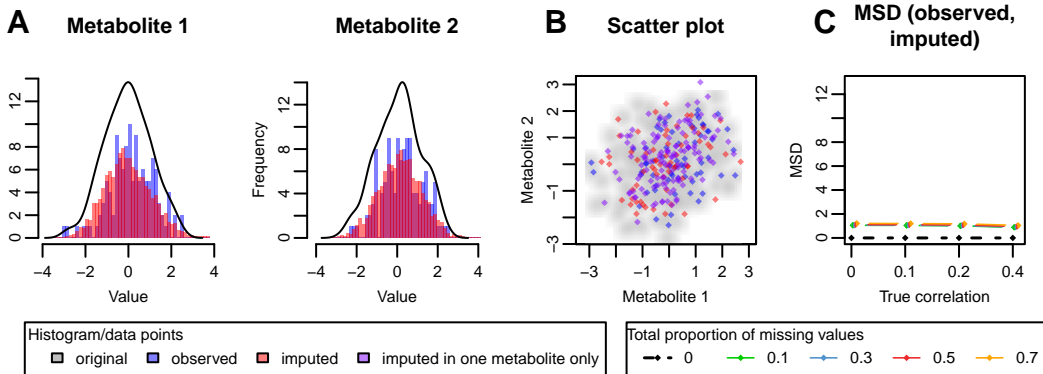


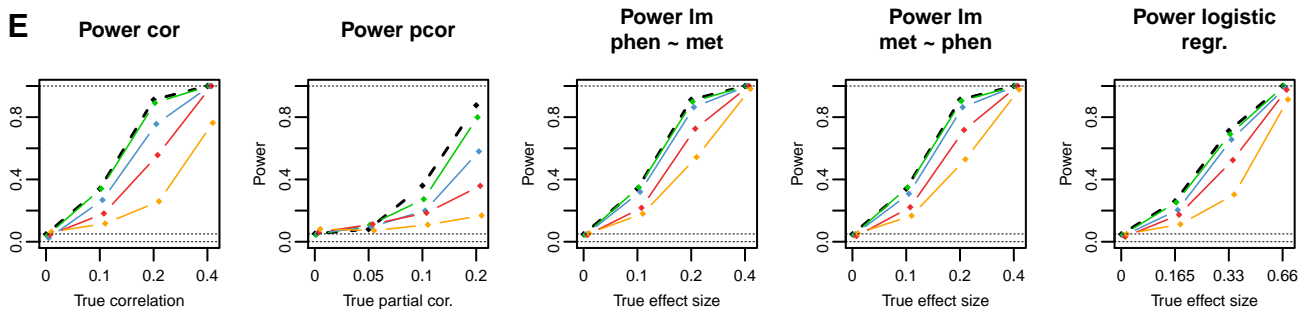
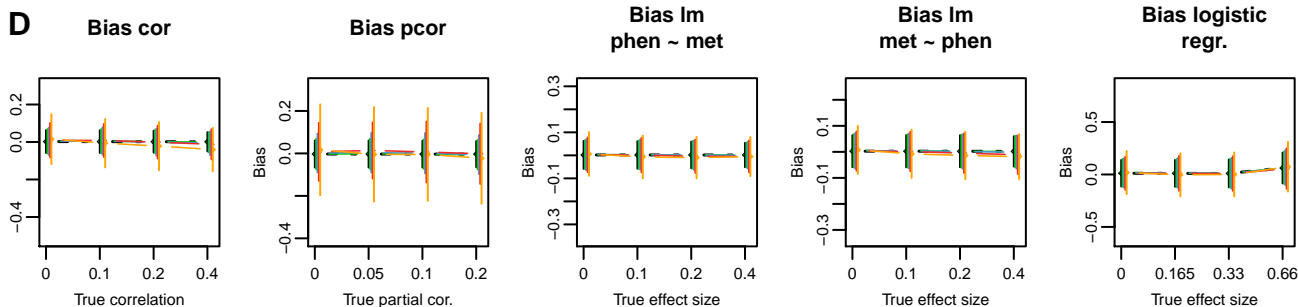
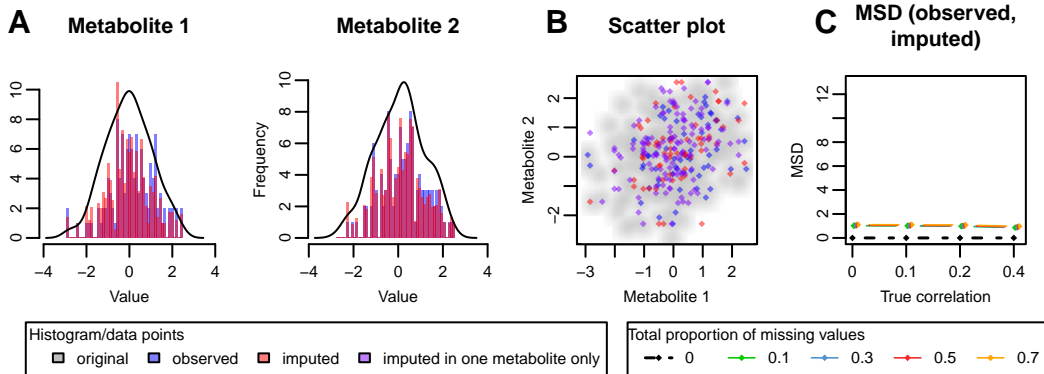


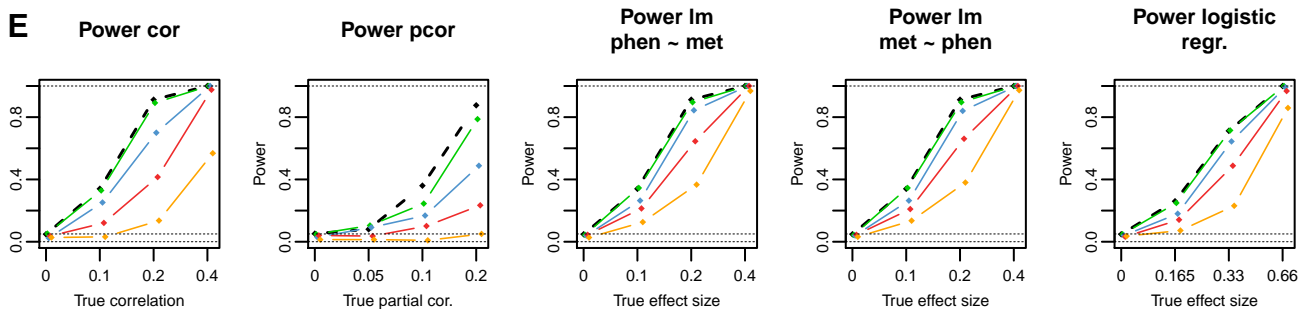
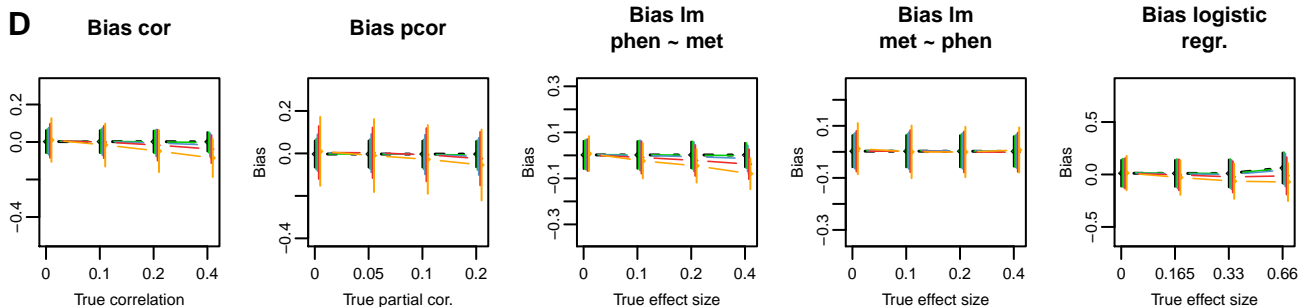
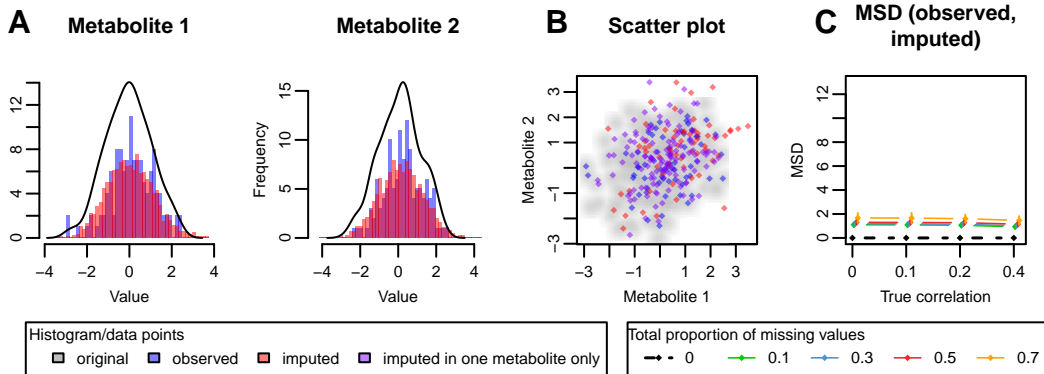


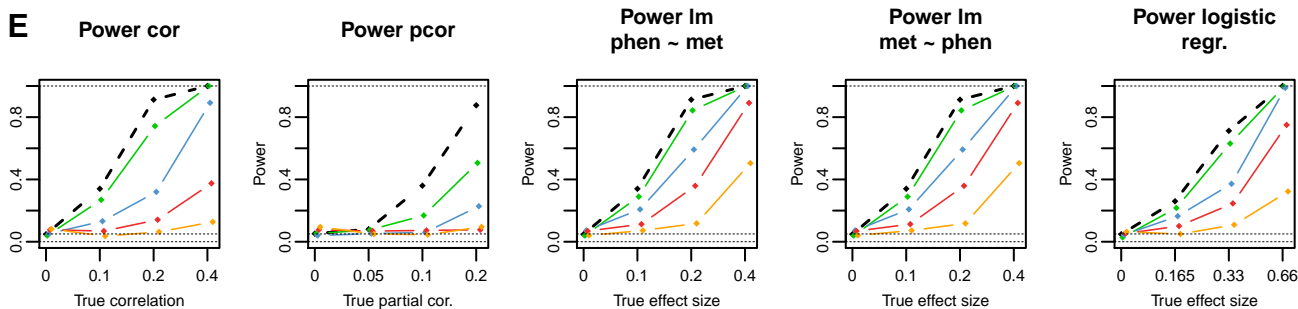
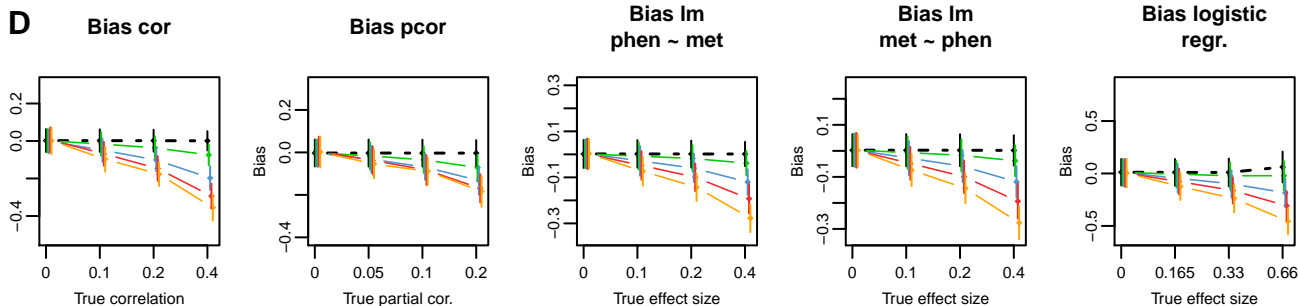
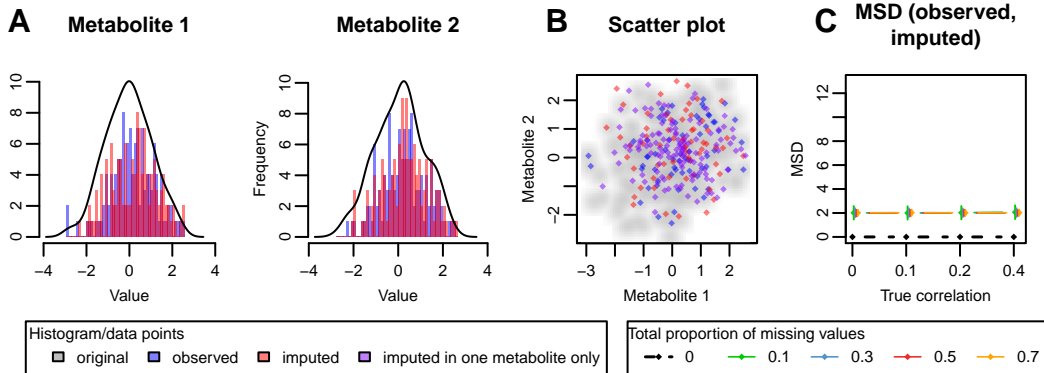


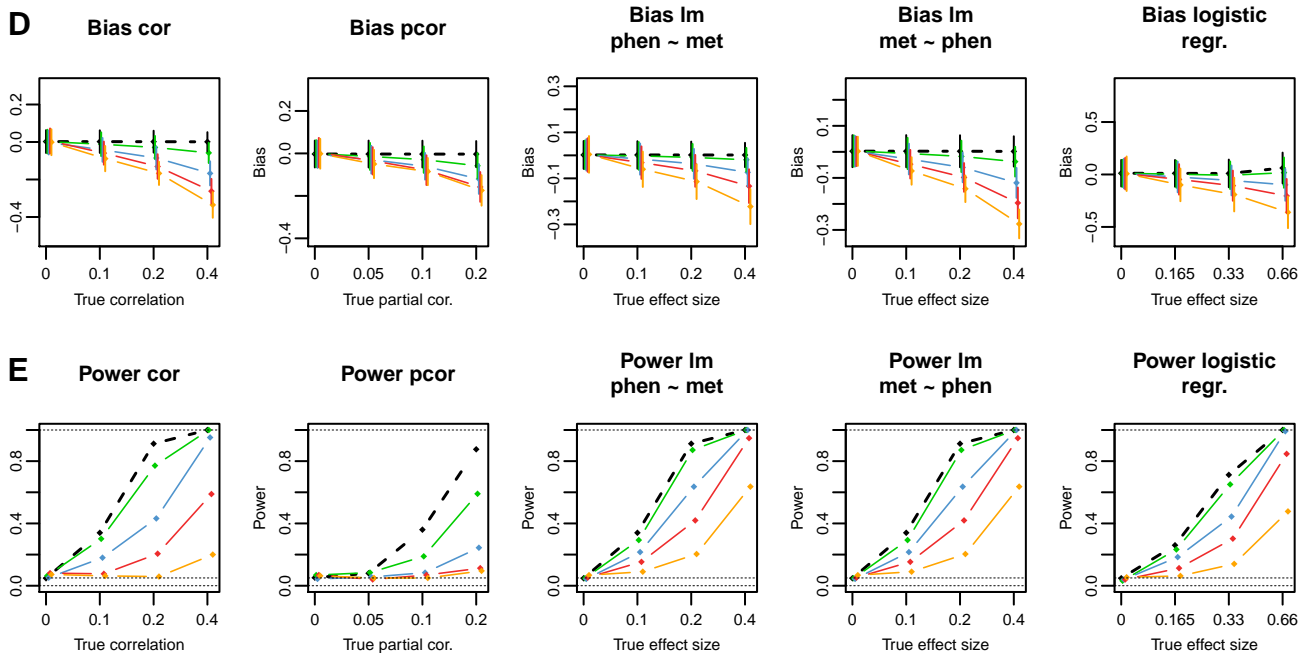
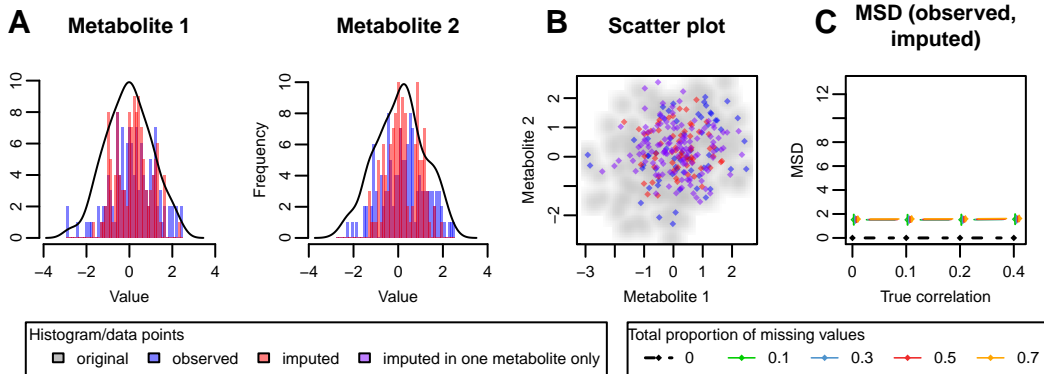


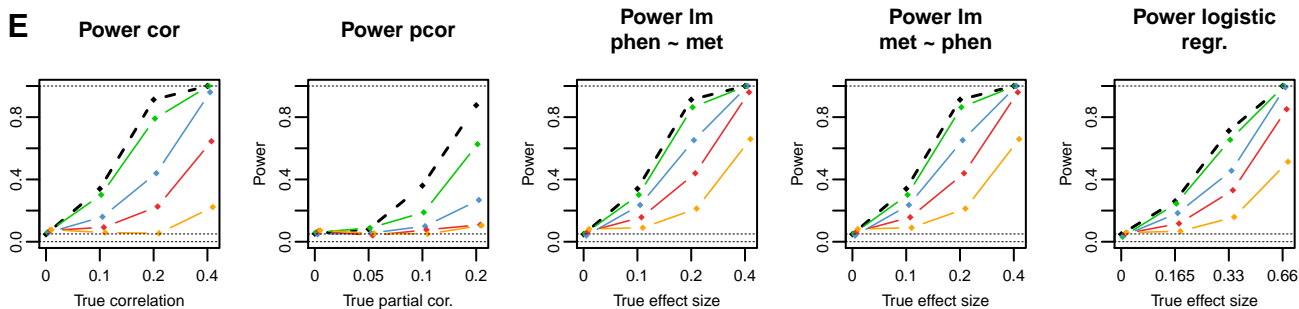
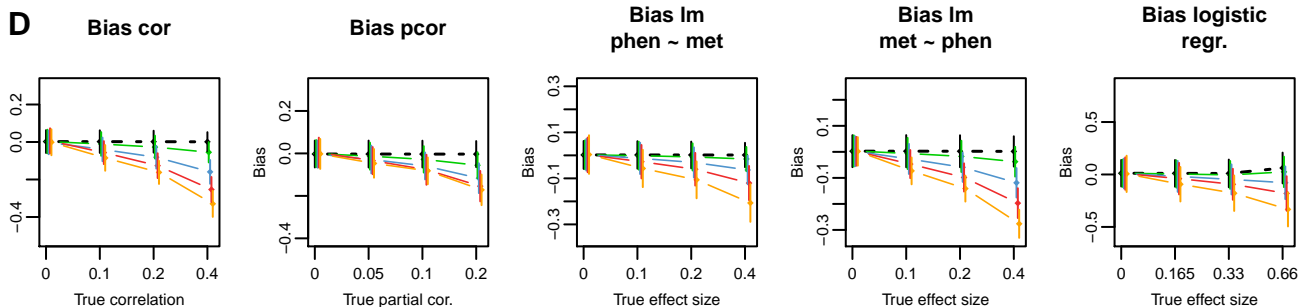
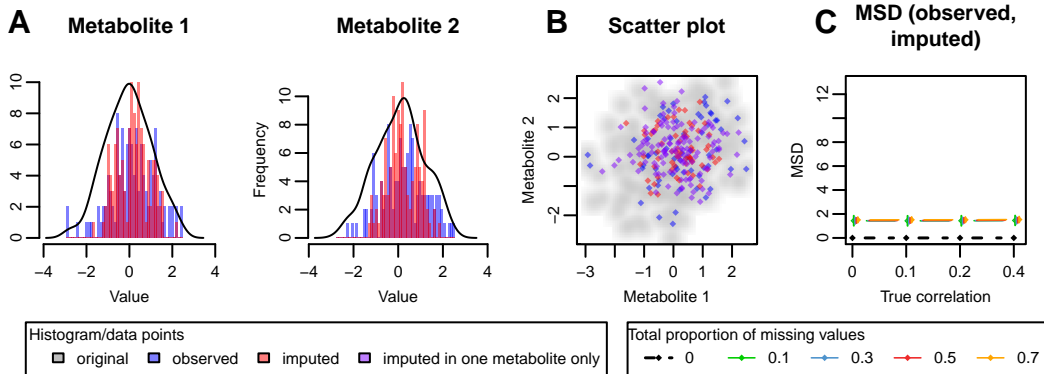


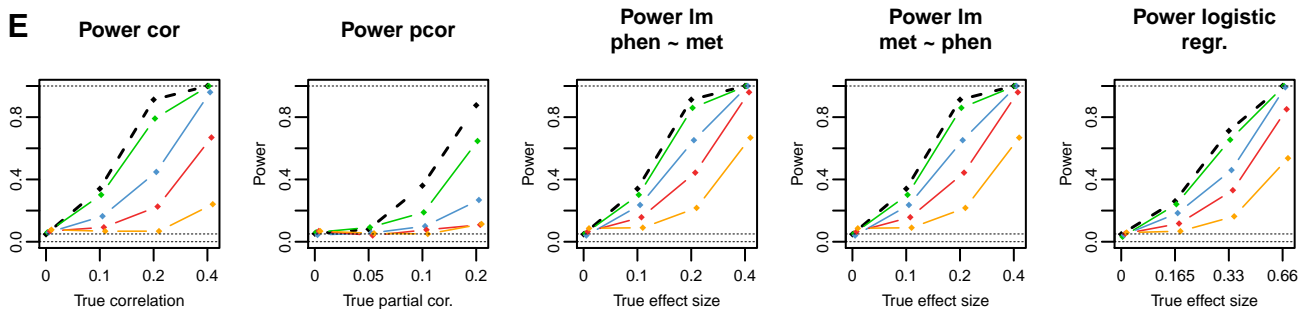
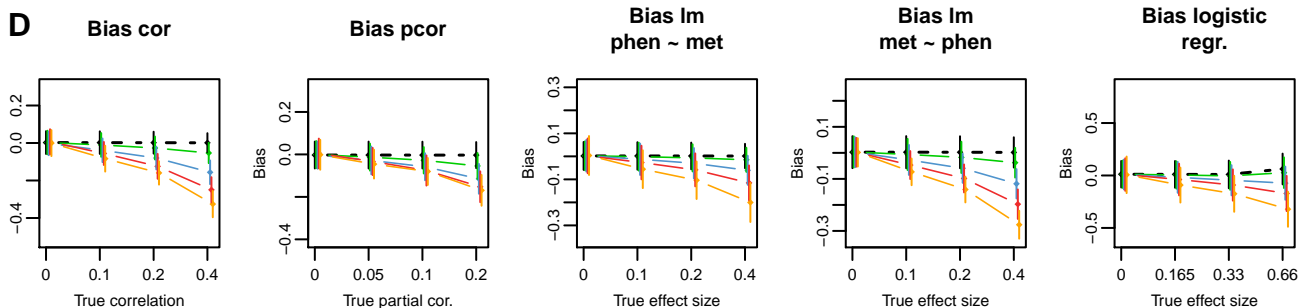
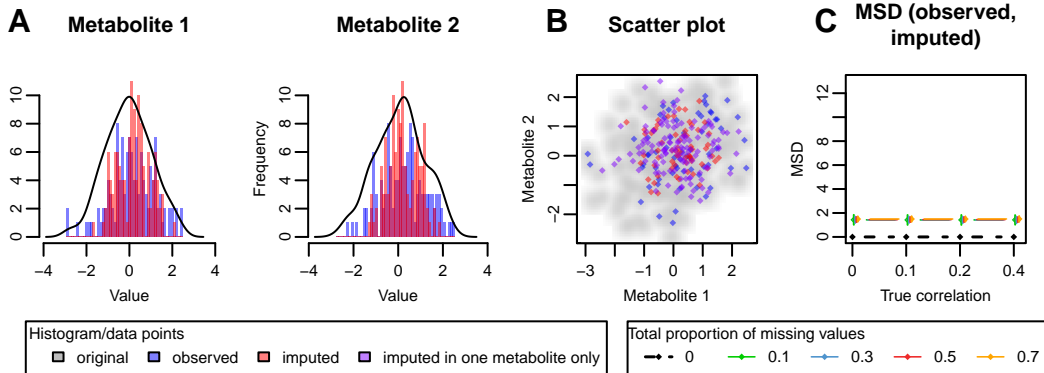


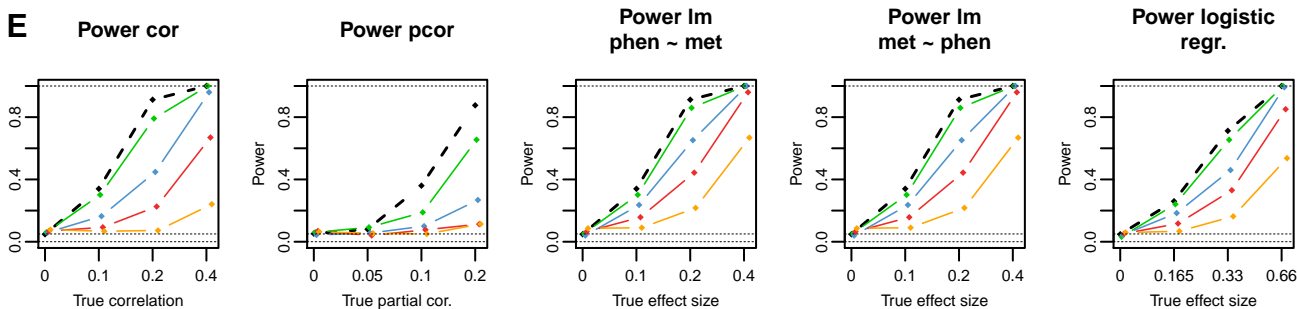
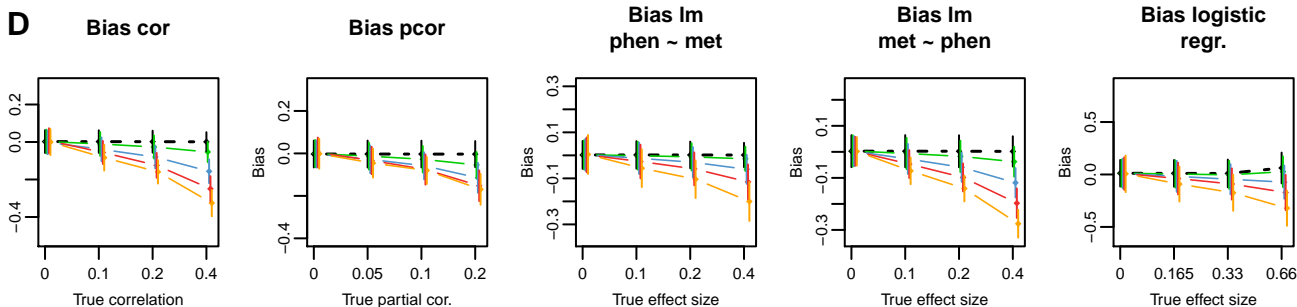
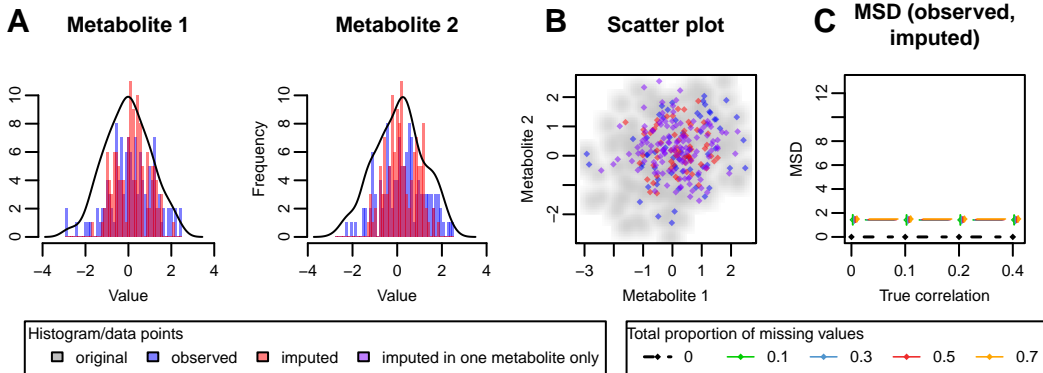


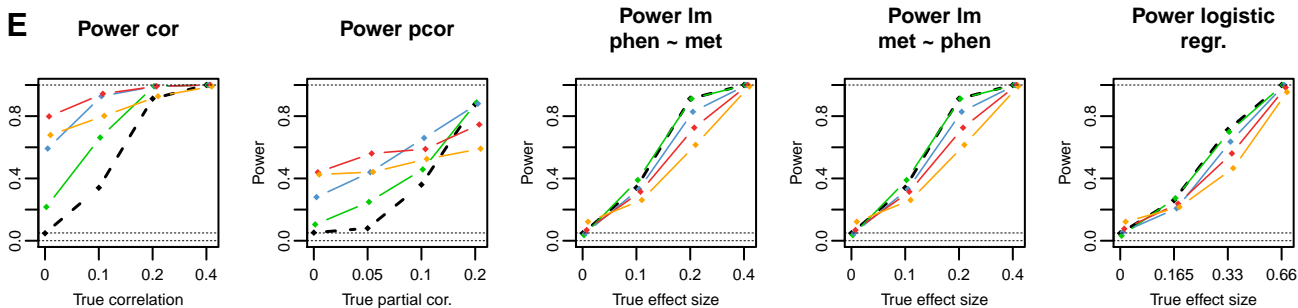
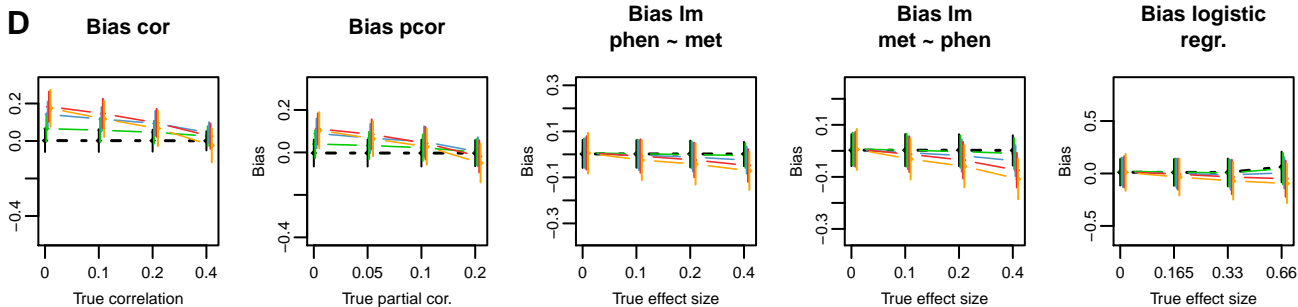
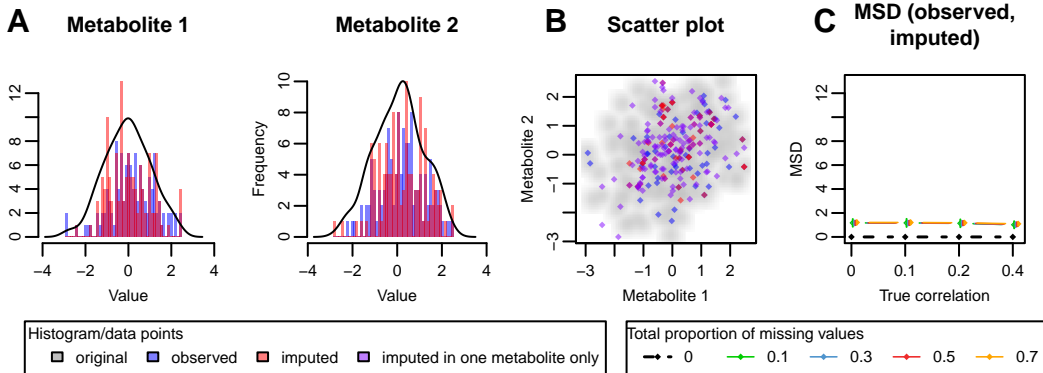


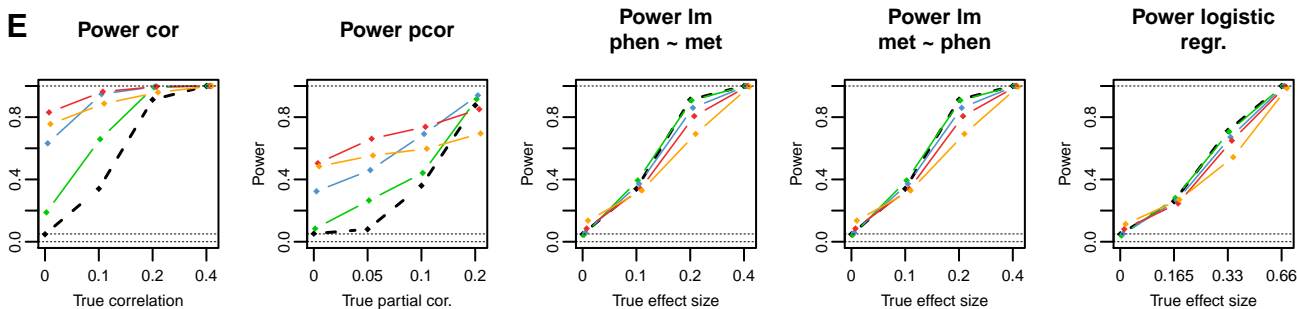
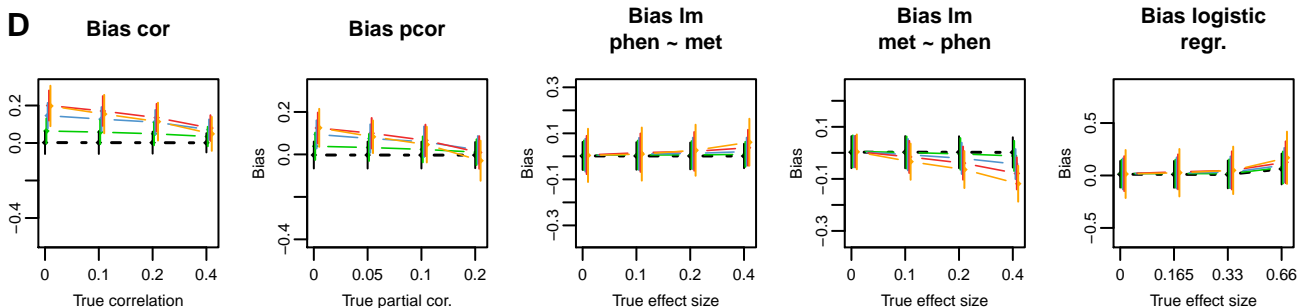
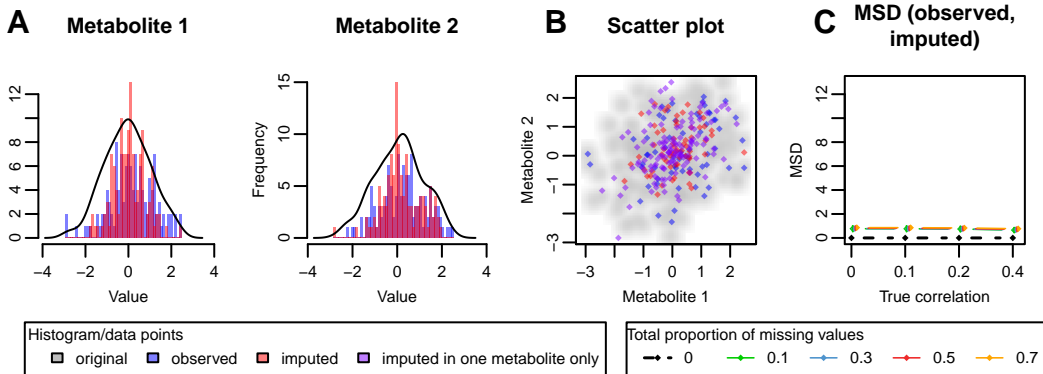


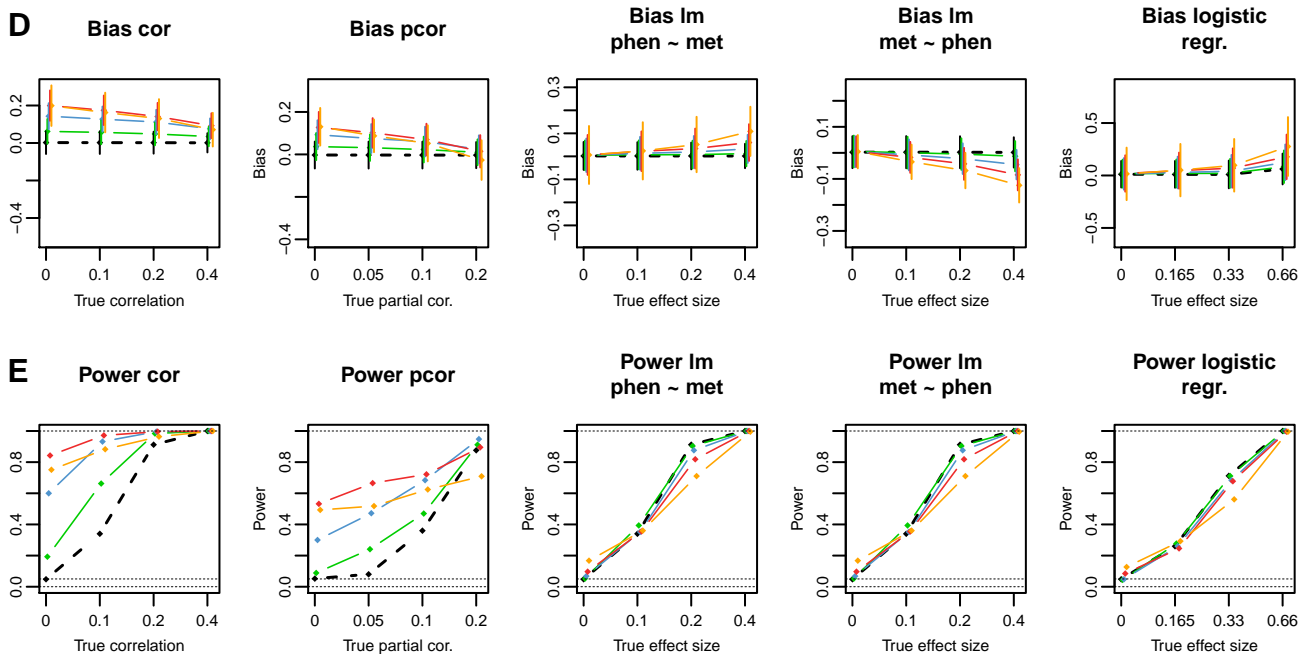
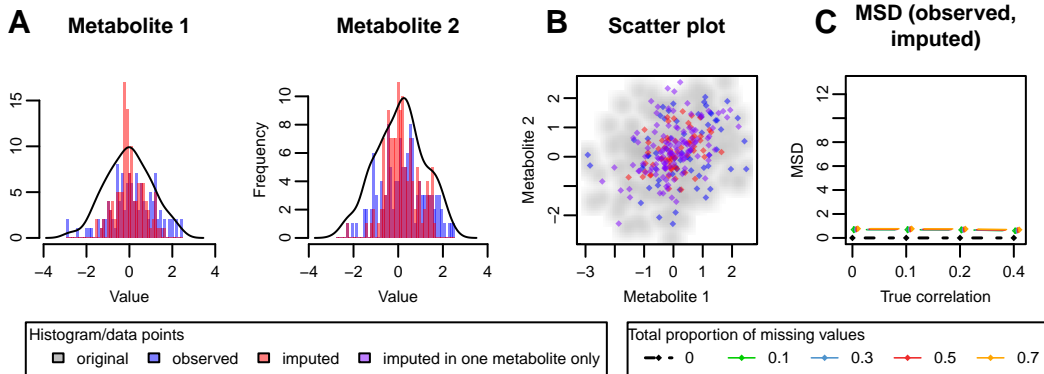


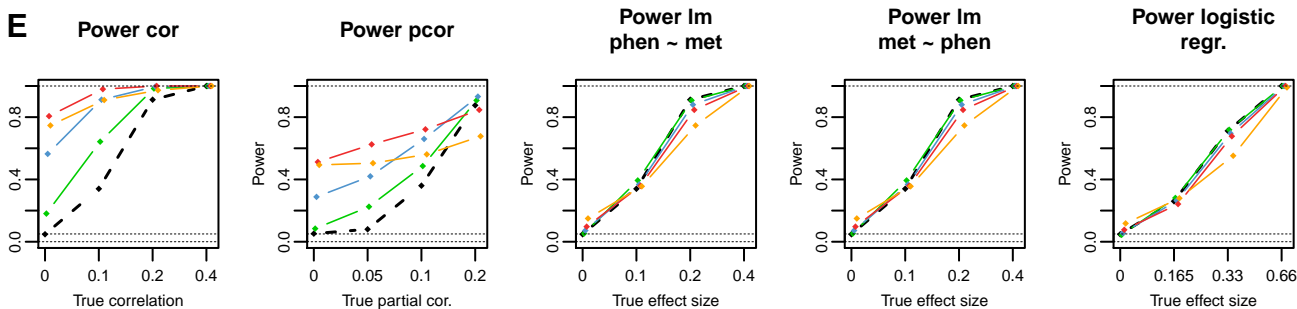
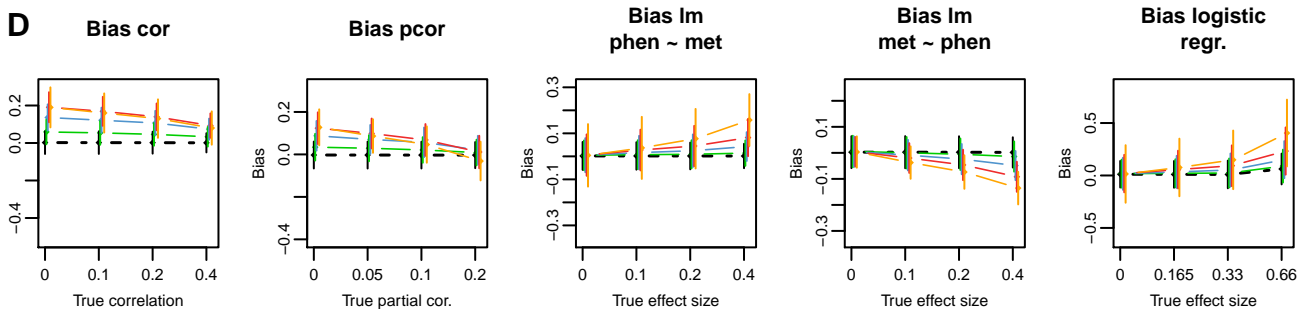
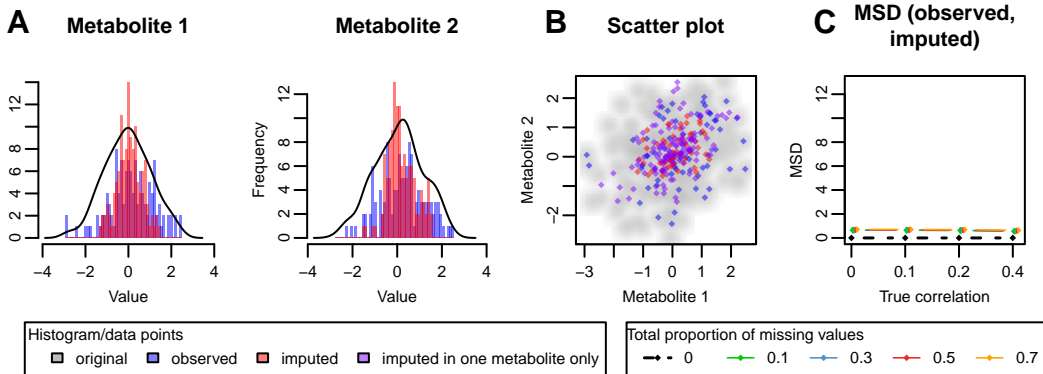


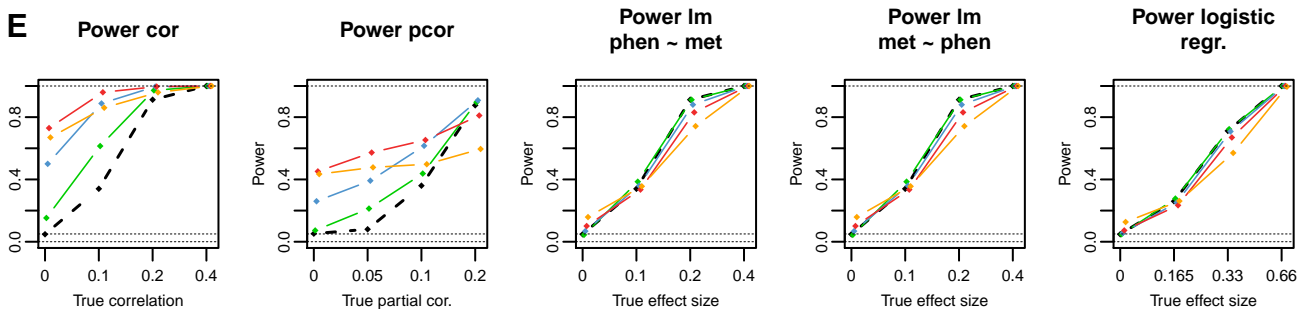
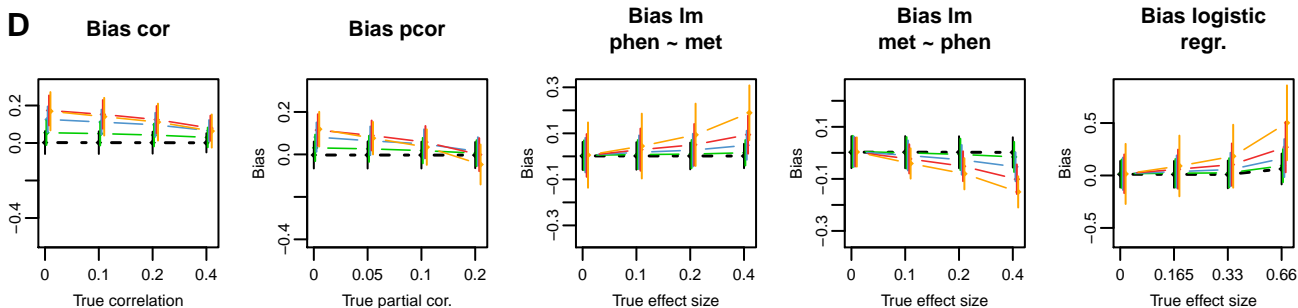
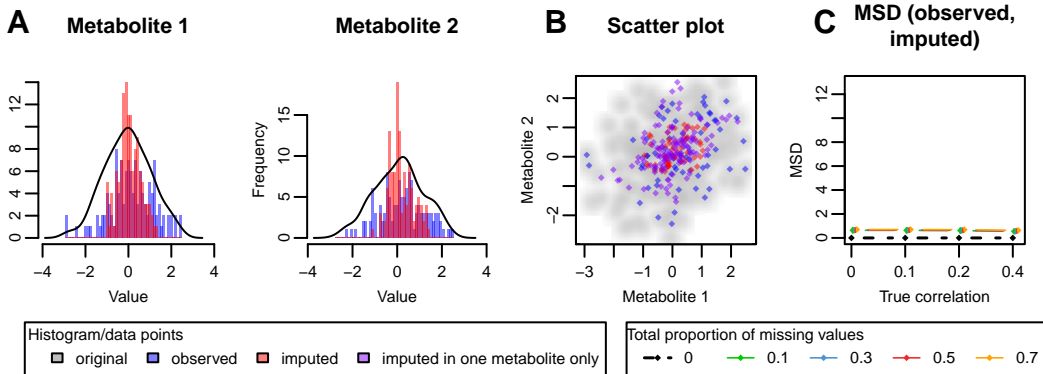


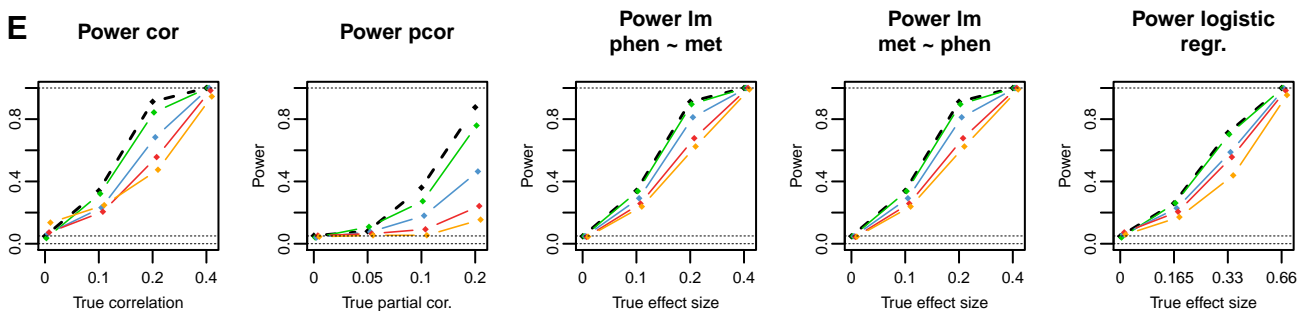
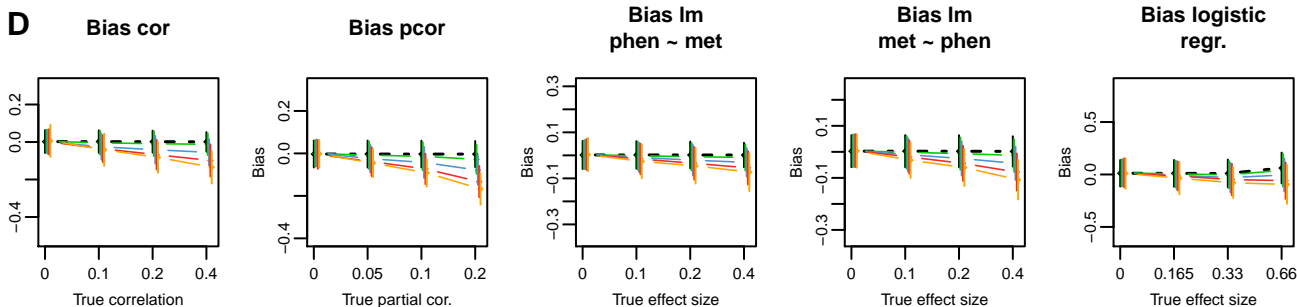
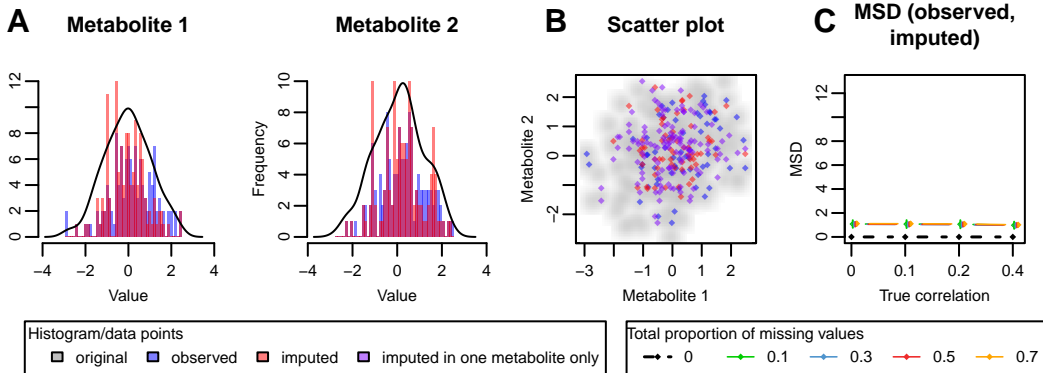


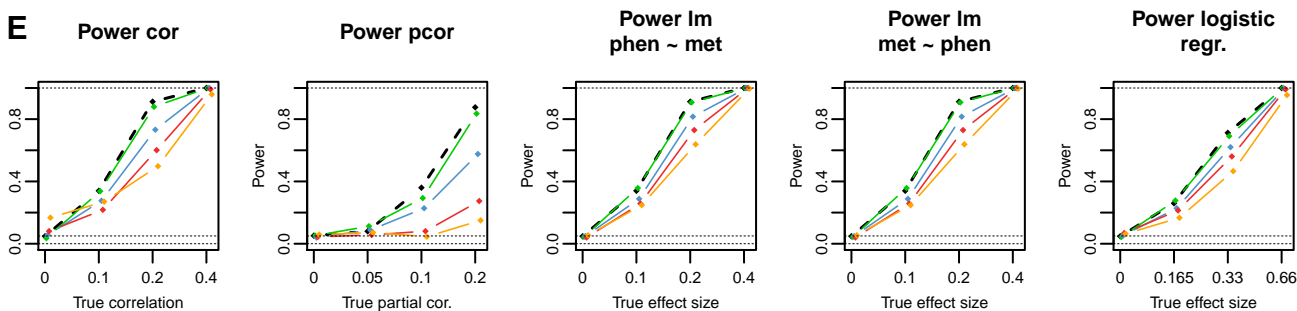
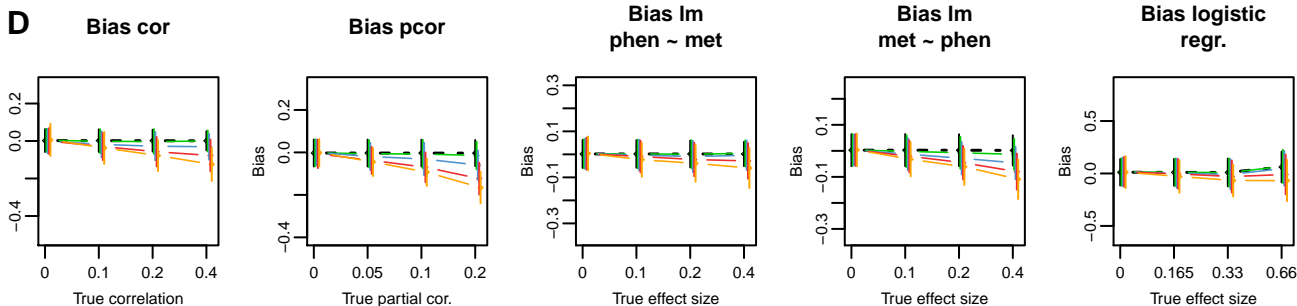
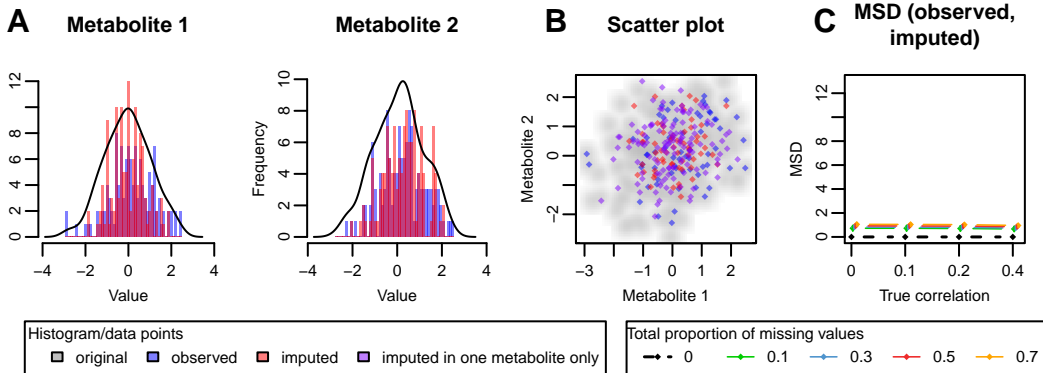


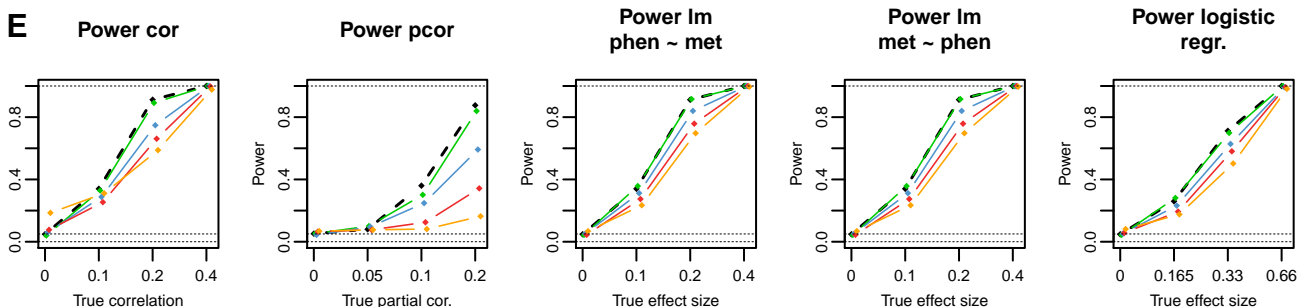
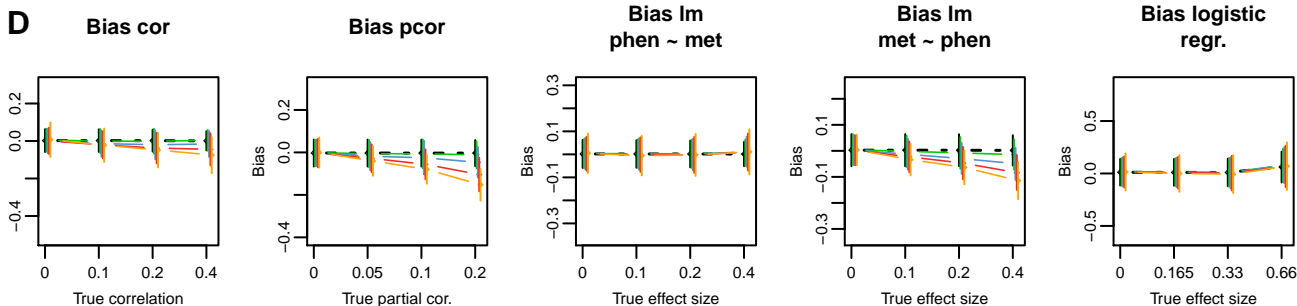
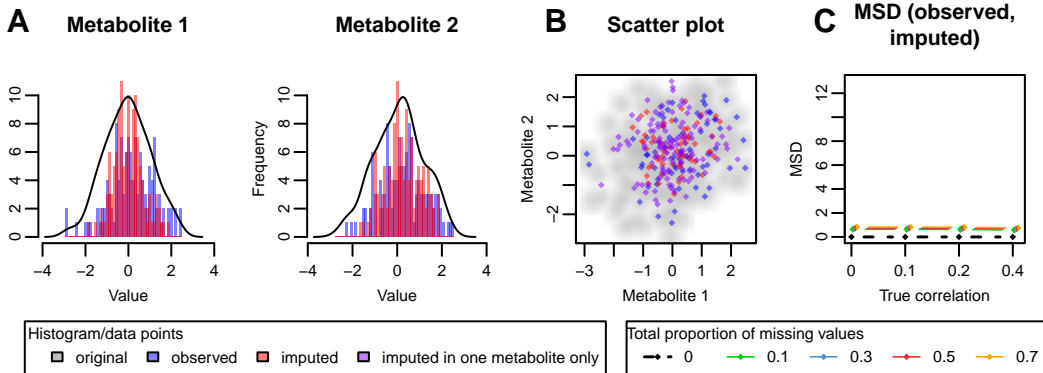


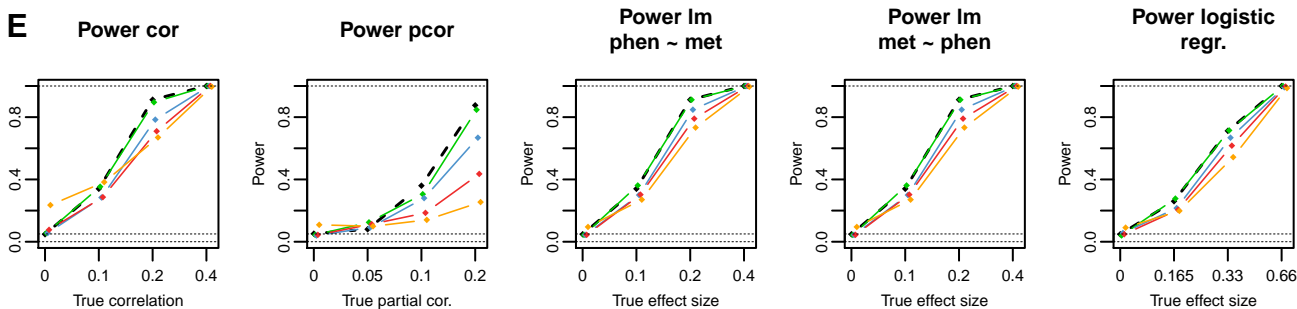
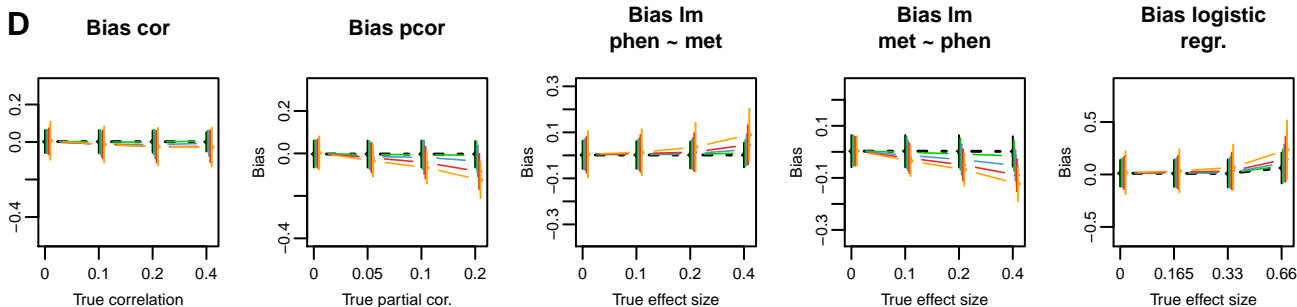
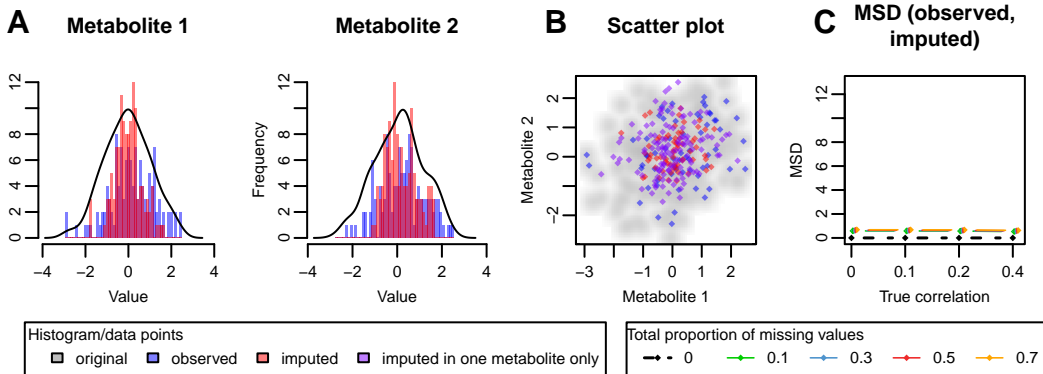


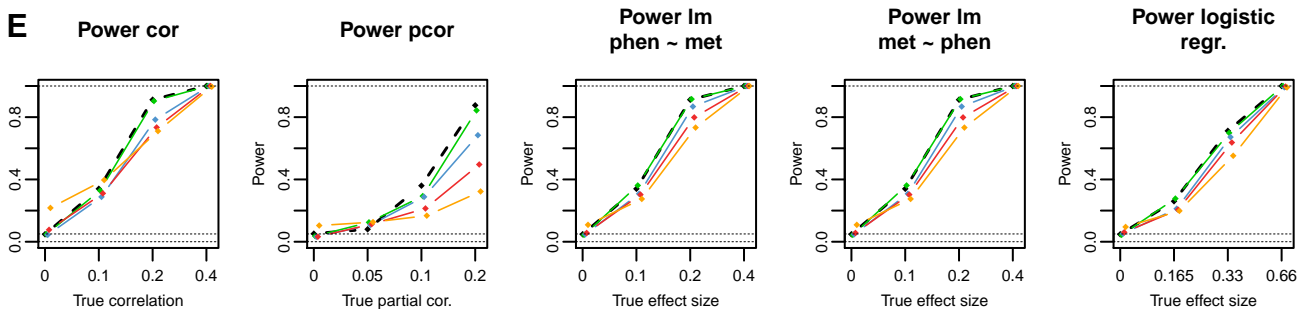
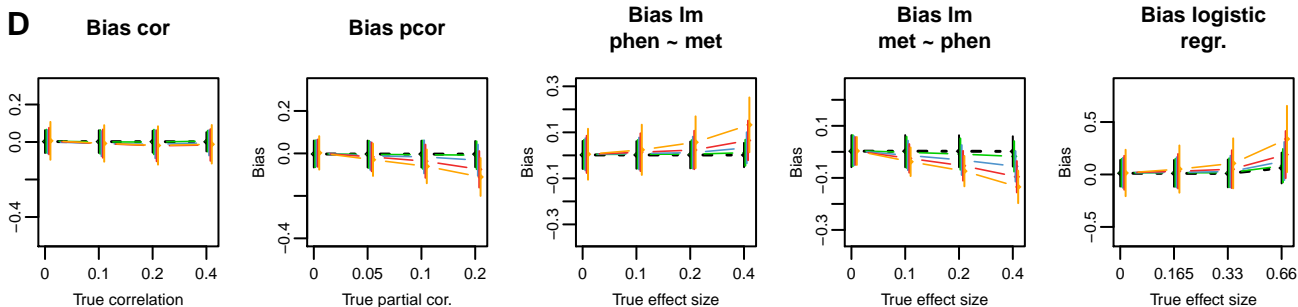
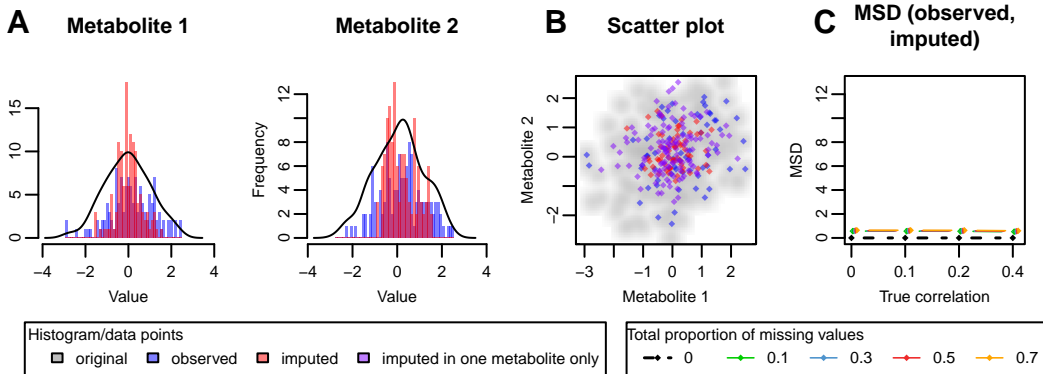


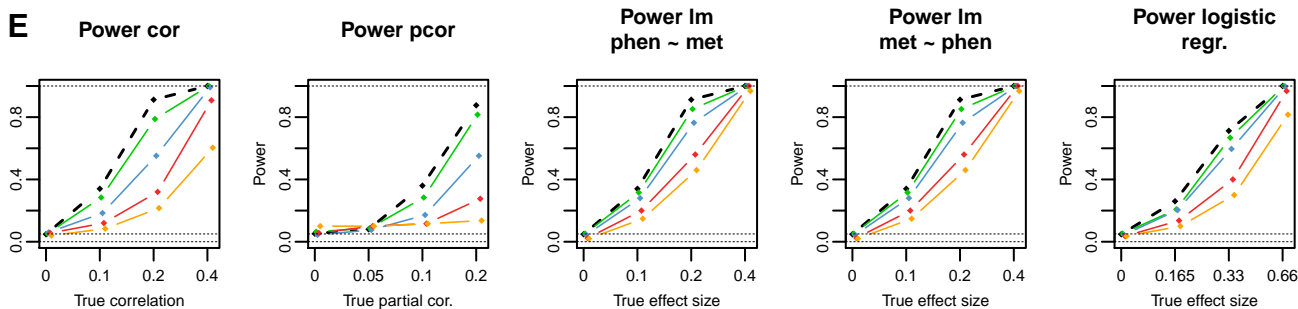
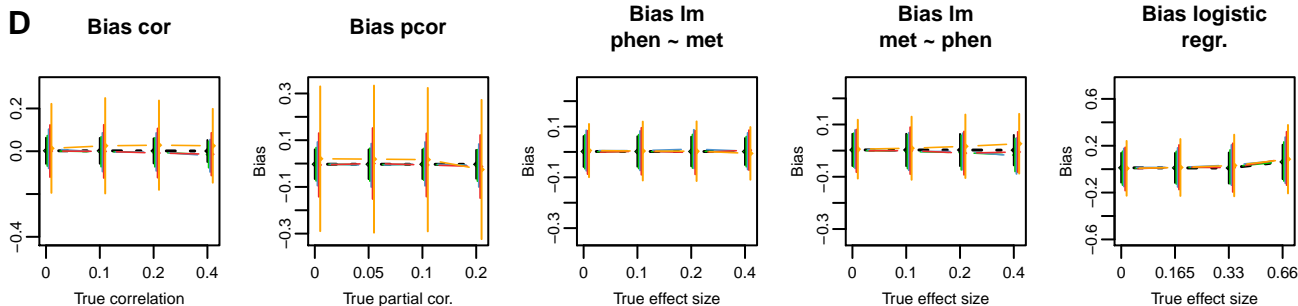
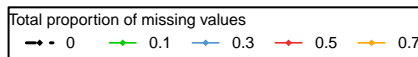
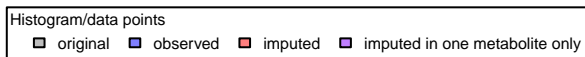
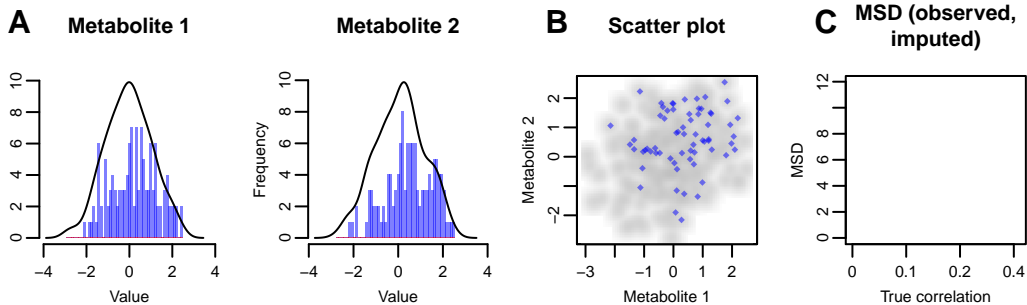


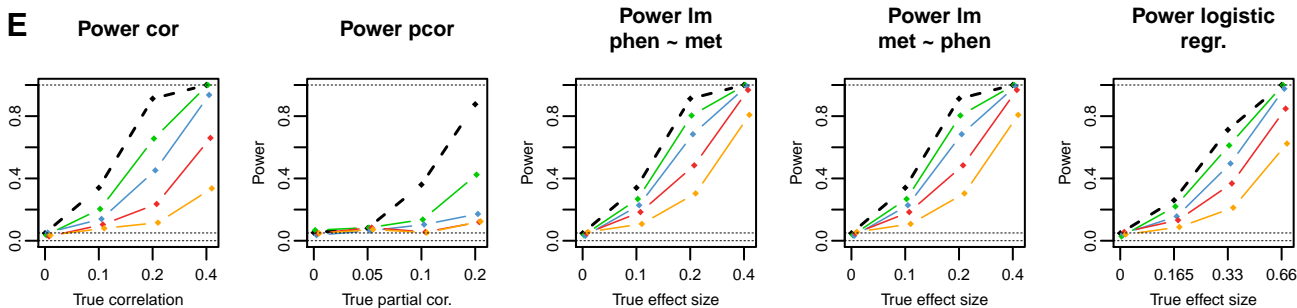
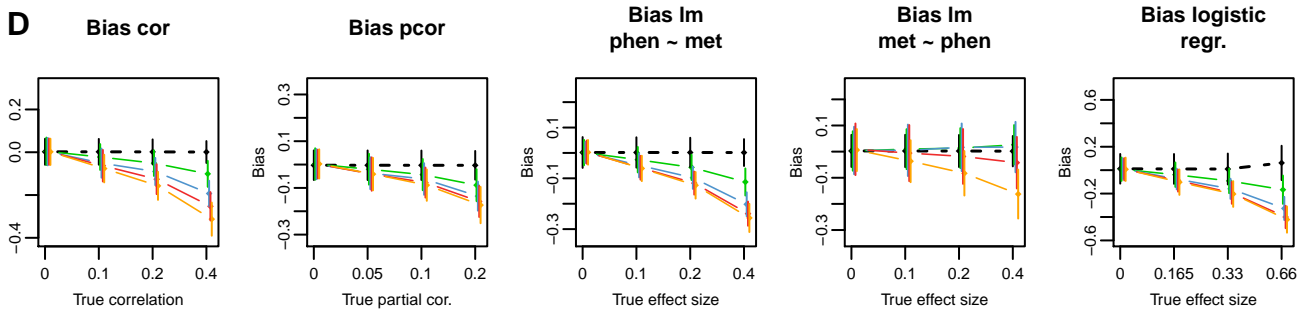
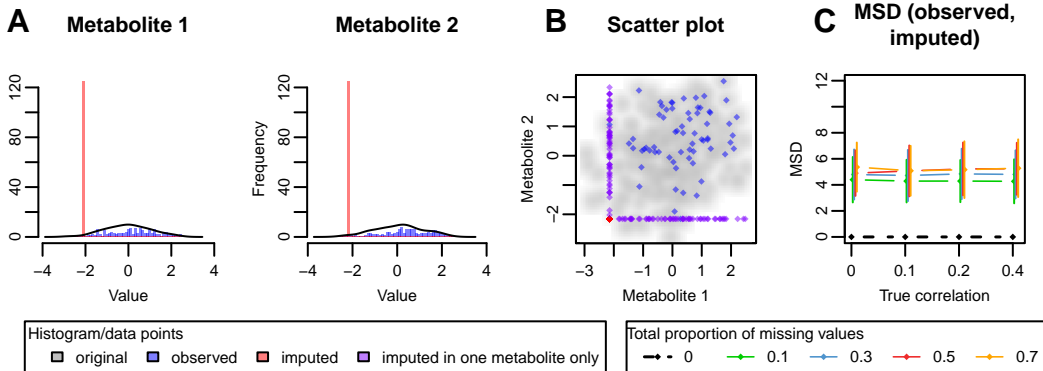




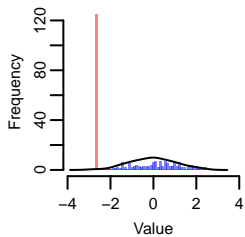




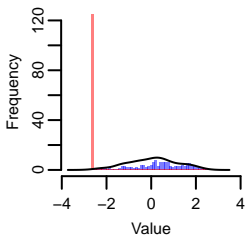




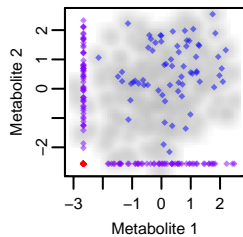
A Metabolite 1



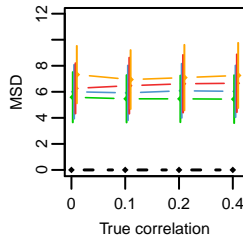
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



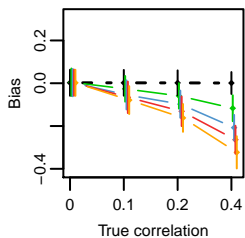
Histogram/data points

original observed imputed imputed in one metabolite only

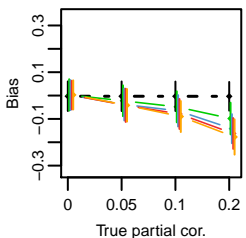
Total proportion of missing values

0 0.1 0.3 0.5 0.7

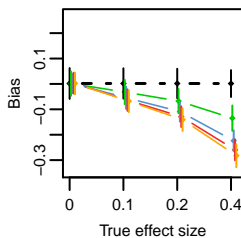
D Bias cor



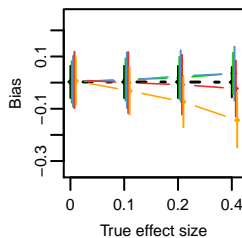
Bias pcor



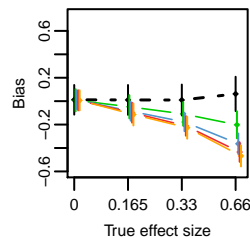
Bias lm phen ~ met



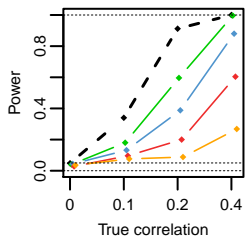
Bias lm met ~ phen



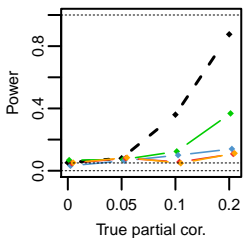
Bias logistic regr.



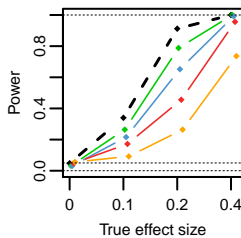
E Power cor



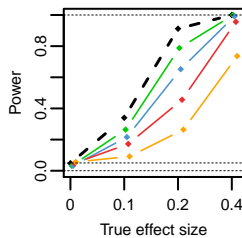
Power pcor



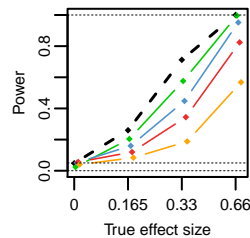
Power lm phen ~ met



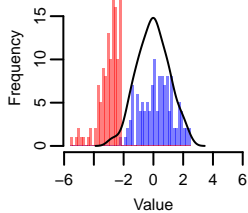
Power lm met ~ phen



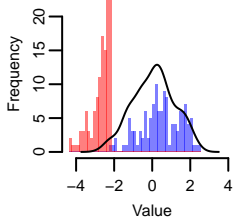
Power logistic regr.



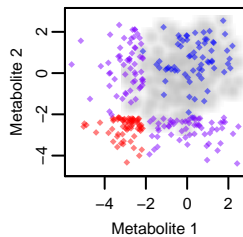
A Metabolite 1



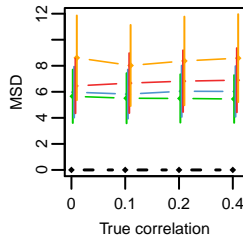
Metabolite 2



B Scatter plot



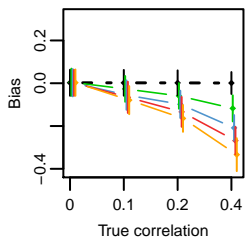
C MSD (observed, imputed)



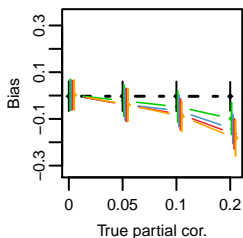
Histogram/data points
 ■ original ■ observed ■ imputed ■ imputed in one metabolite only

Total proportion of missing values
 - - 0 — 0.1 — 0.3 — 0.5 — 0.7

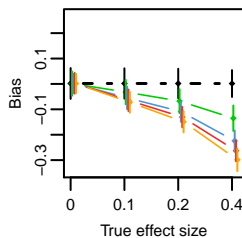
D Bias cor



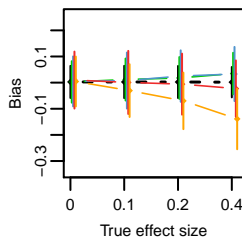
Bias pcor



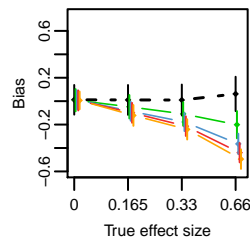
Bias Im phen ~ met



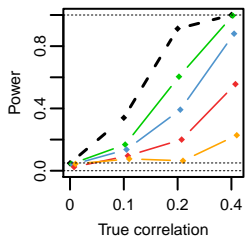
Bias Im met ~ phen



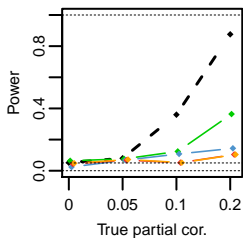
Bias logistic regr.



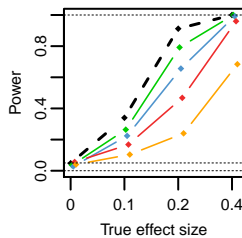
E Power cor



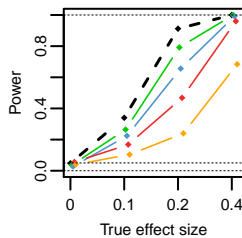
Power pcor



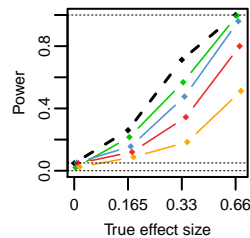
Power Im phen ~ met



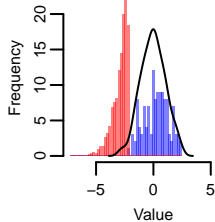
Power Im met ~ phen



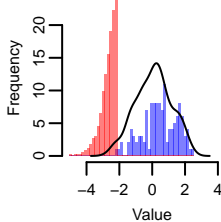
Power logistic regr.



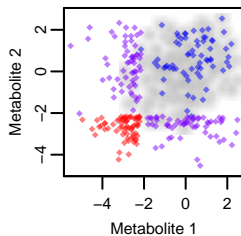
A Metabolite 1



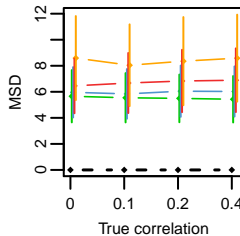
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



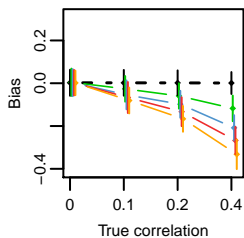
Histogram/data points

■ original ■ observed ■ imputed ■ imputed in one metabolite only

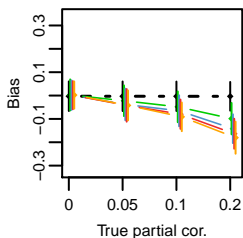
Total proportion of missing values

→ 0 → 0.1 → 0.3 → 0.5 → 0.7

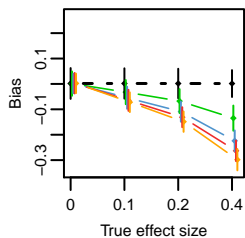
D Bias cor



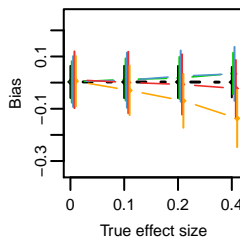
Bias pcor



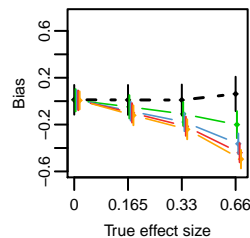
Bias lm phen ~ met



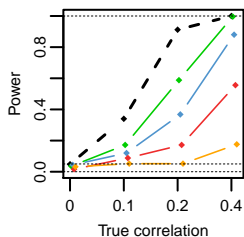
Bias lm met ~ phen



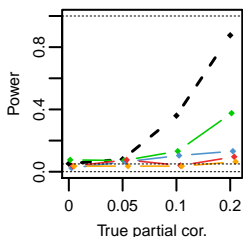
Bias logistic regr.



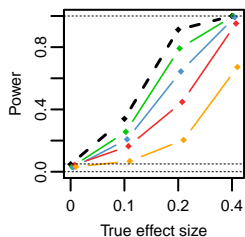
E Power cor



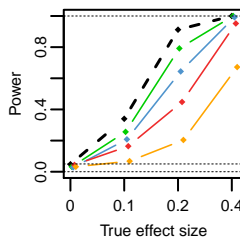
Power pcor



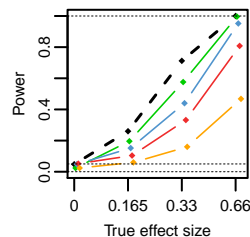
Power lm phen ~ met



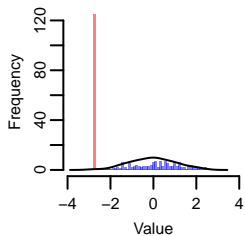
Power lm met ~ phen



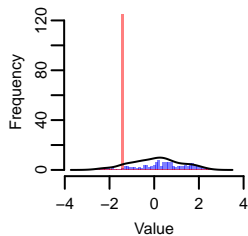
Power logistic regr.



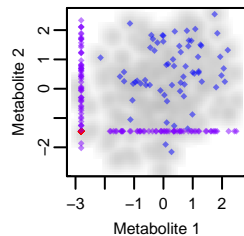
A Metabolite 1



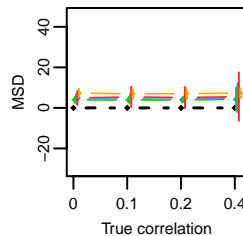
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



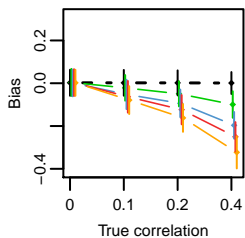
Histogram/data points

original observed imputed imputed in one metabolite only

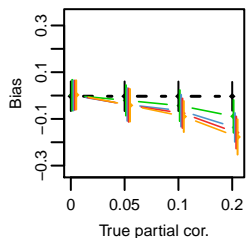
Total proportion of missing values

0 0.1 0.3 0.5 0.7

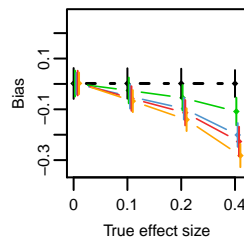
D Bias cor



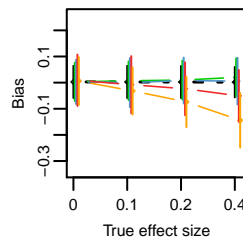
Bias pcor



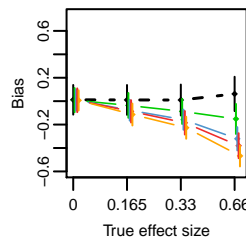
Bias lm phen ~ met



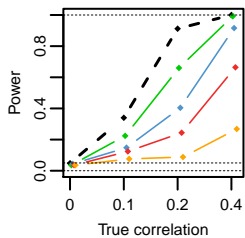
Bias lm met ~ phen



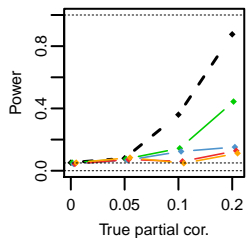
Bias logistic regr.



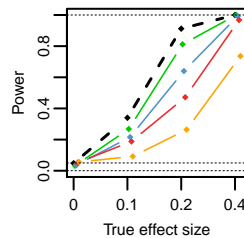
E Power cor



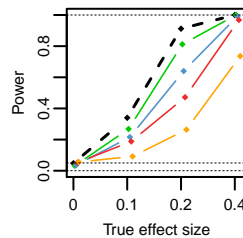
Power pcor



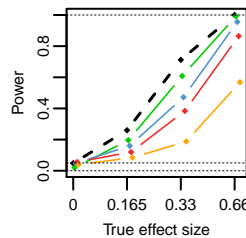
Power lm phen ~ met

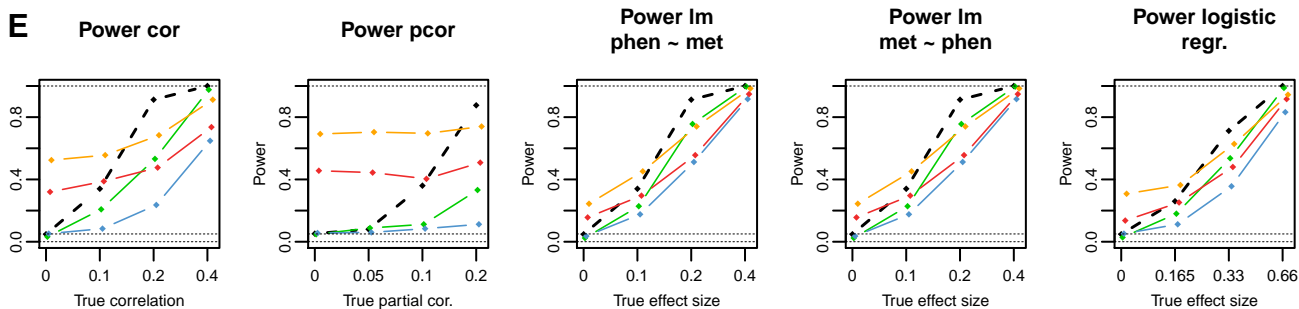
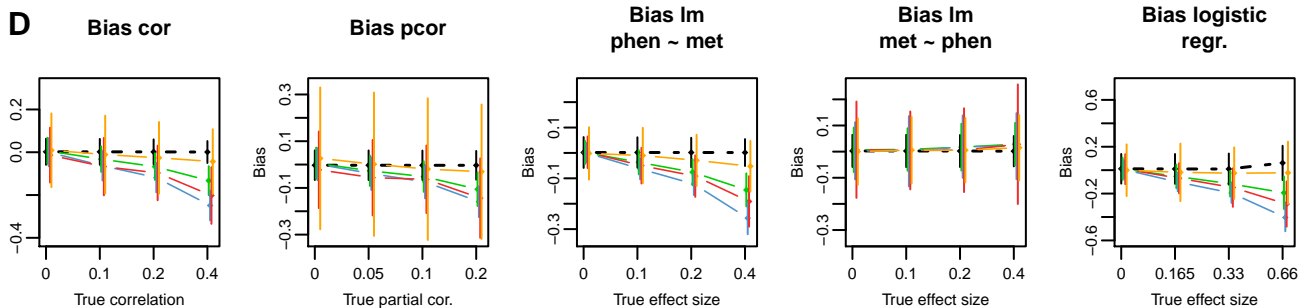
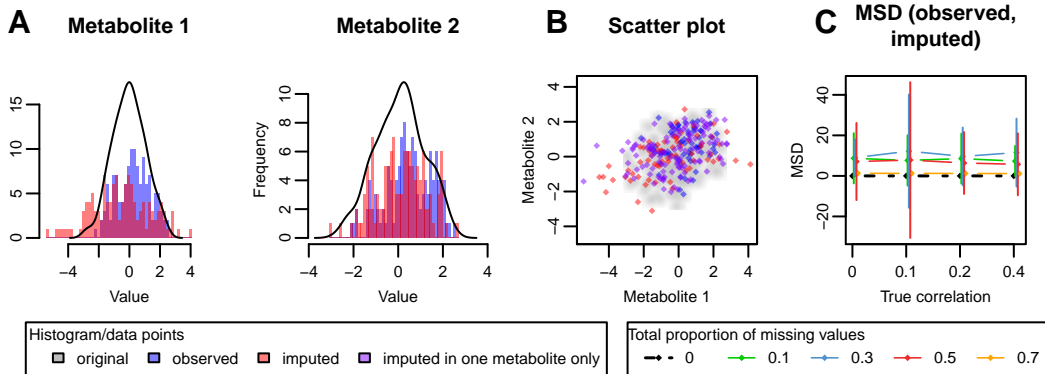


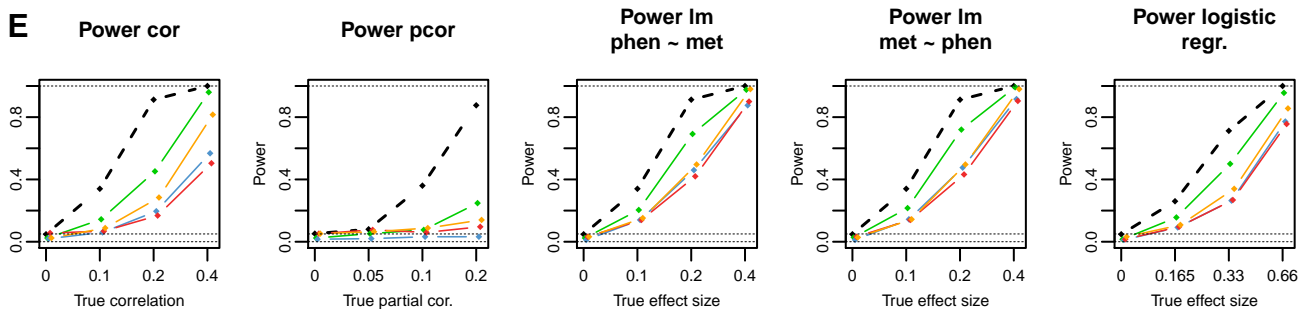
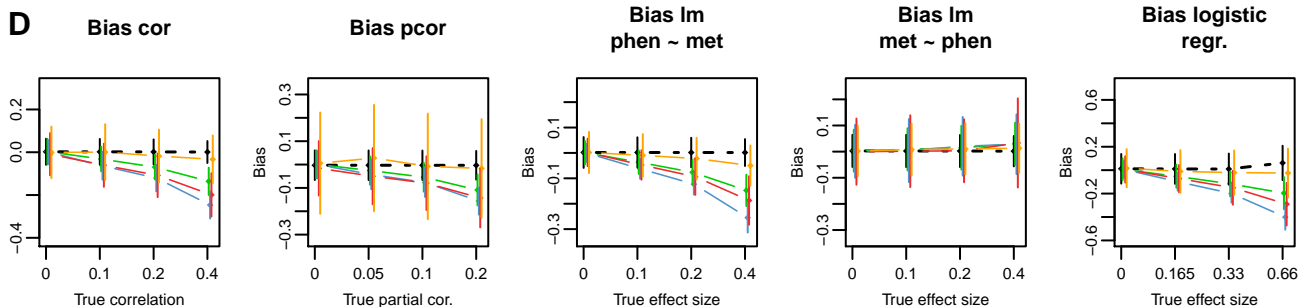
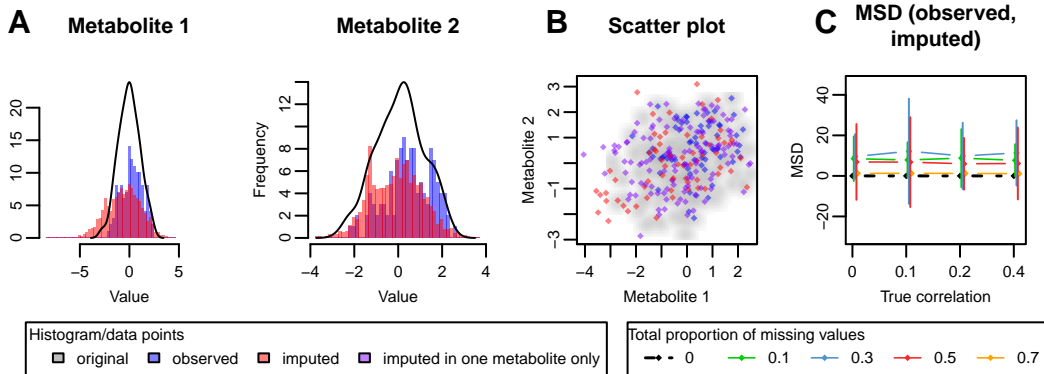
Power lm met ~ phen

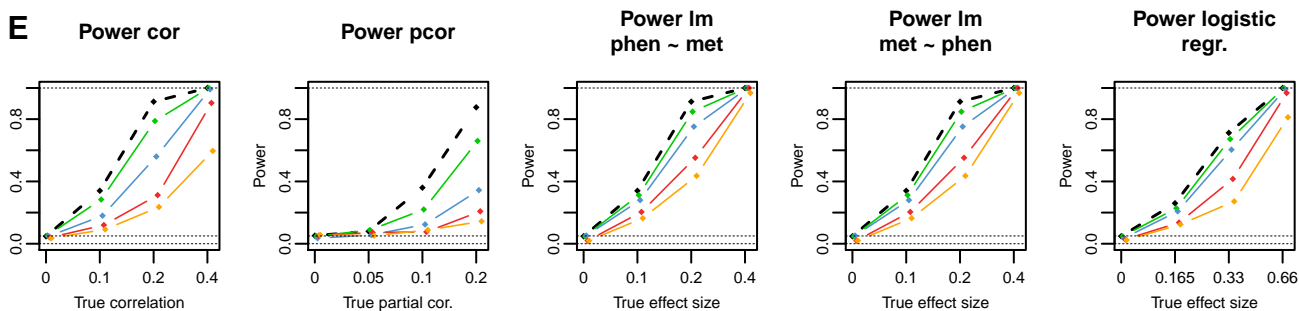
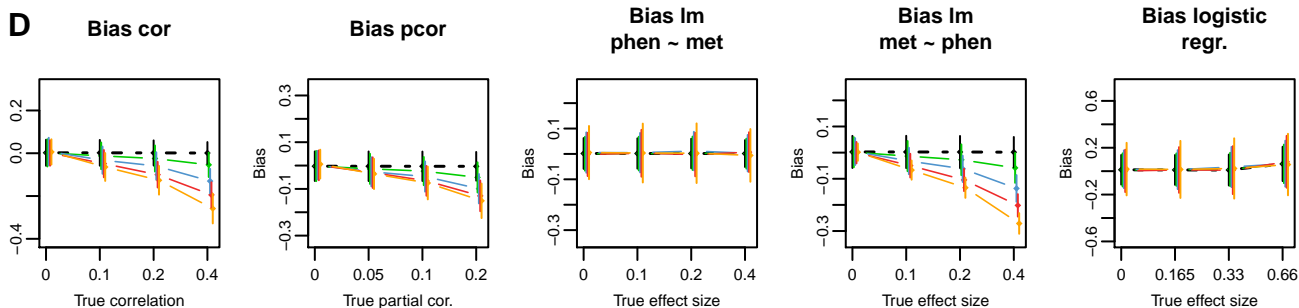
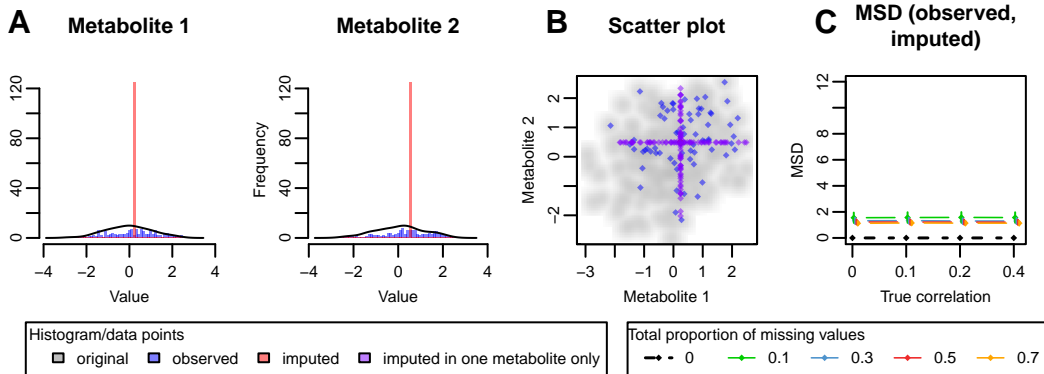


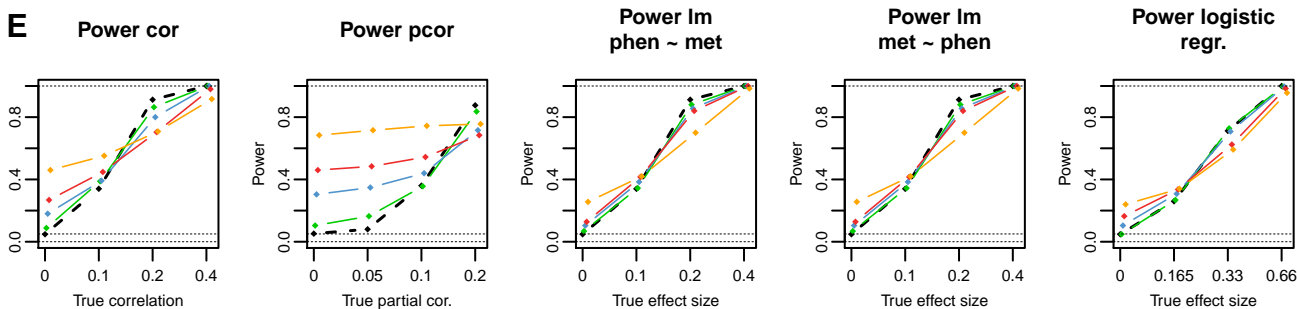
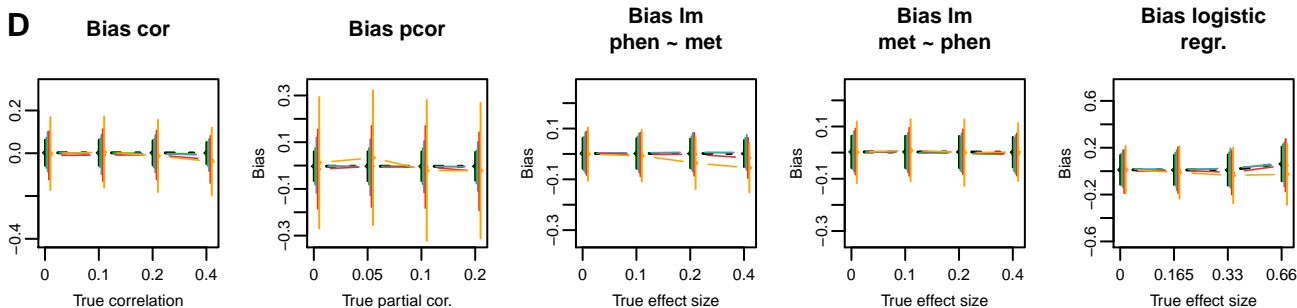
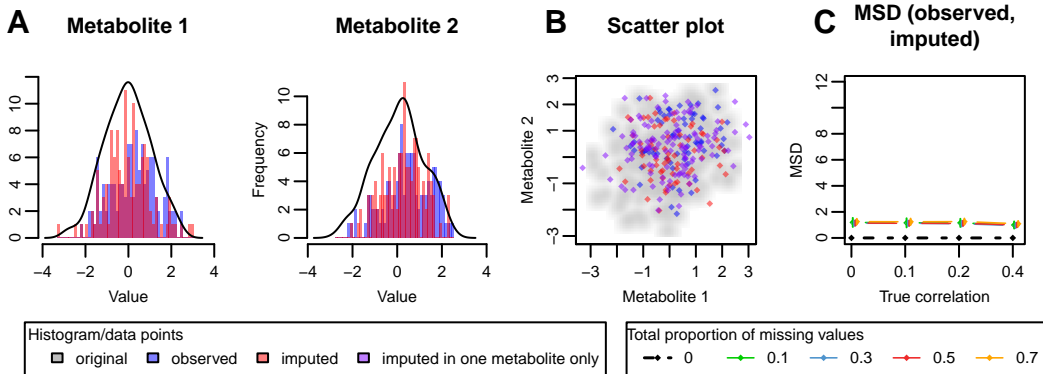
Power logistic regr.

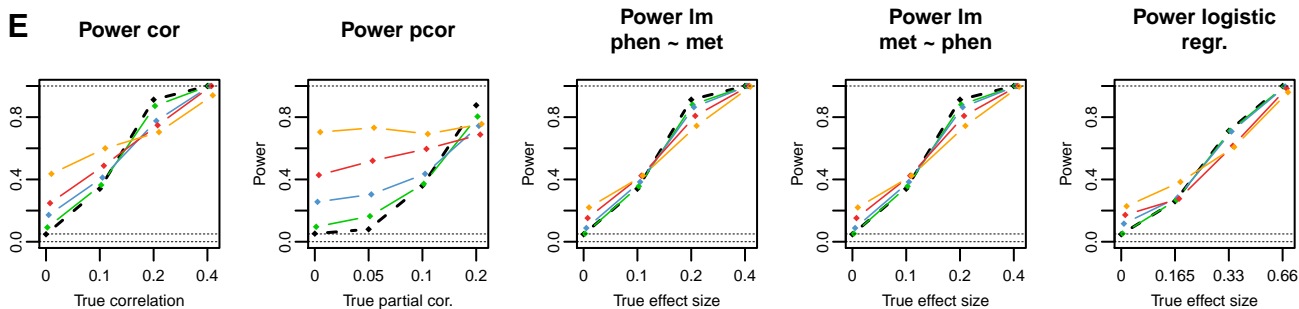
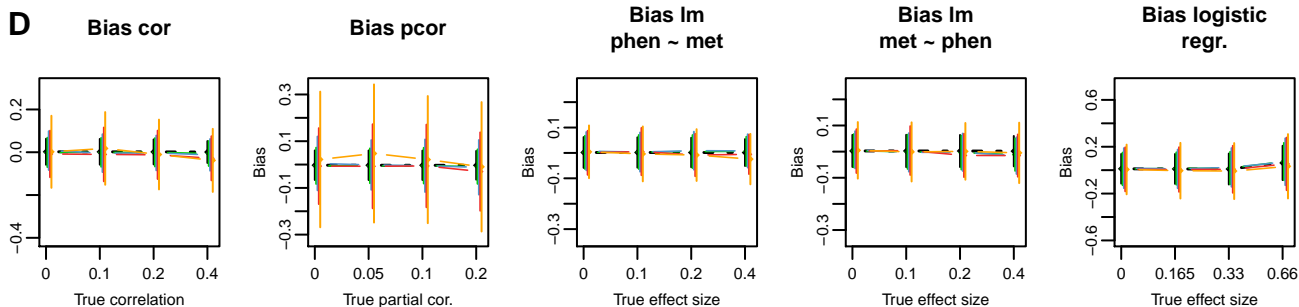
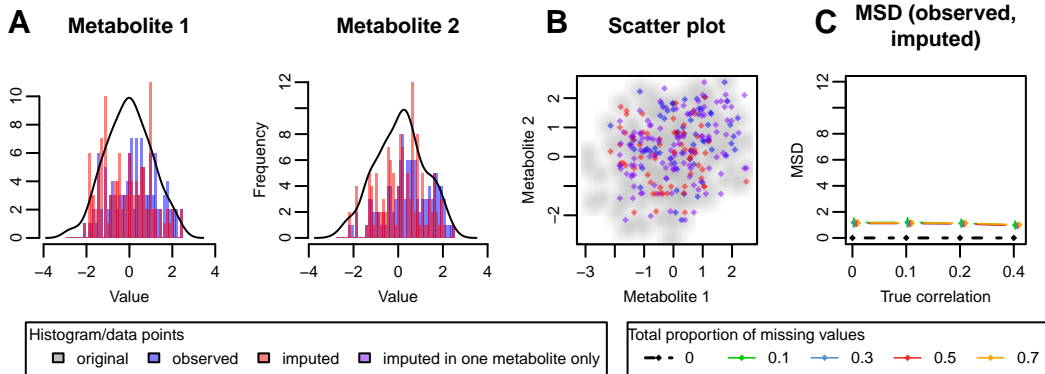


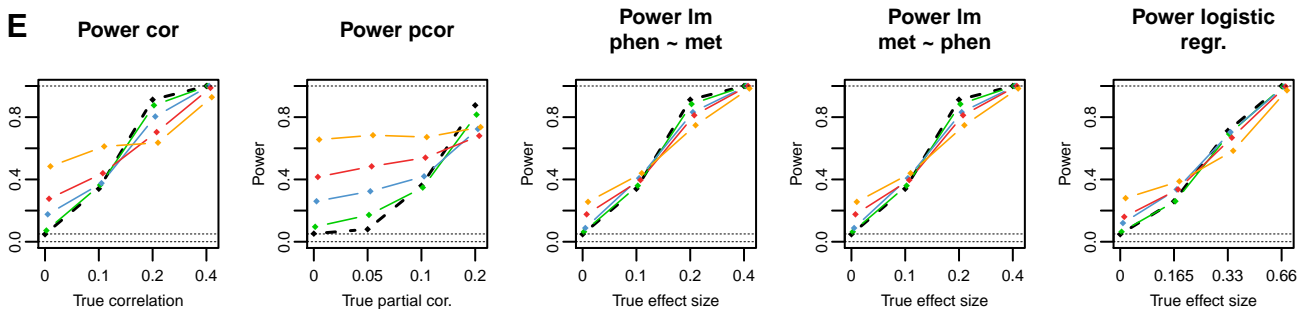
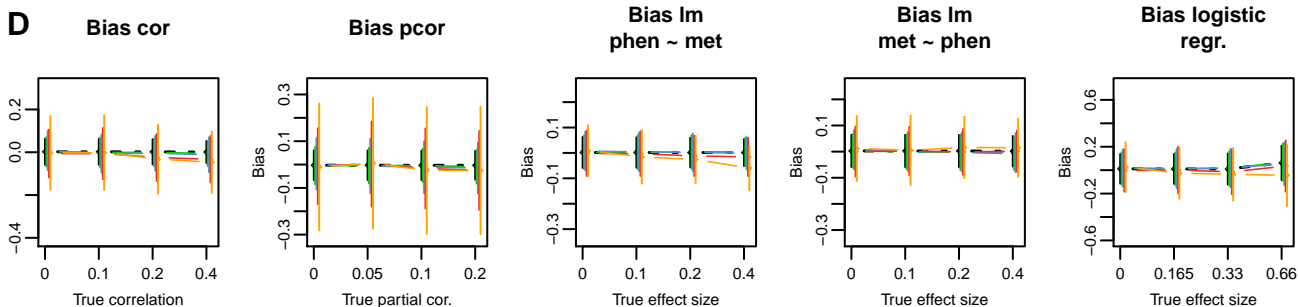
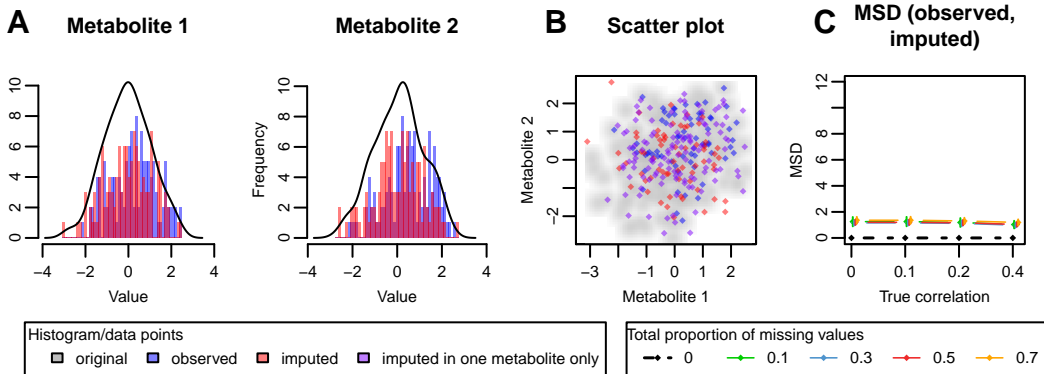


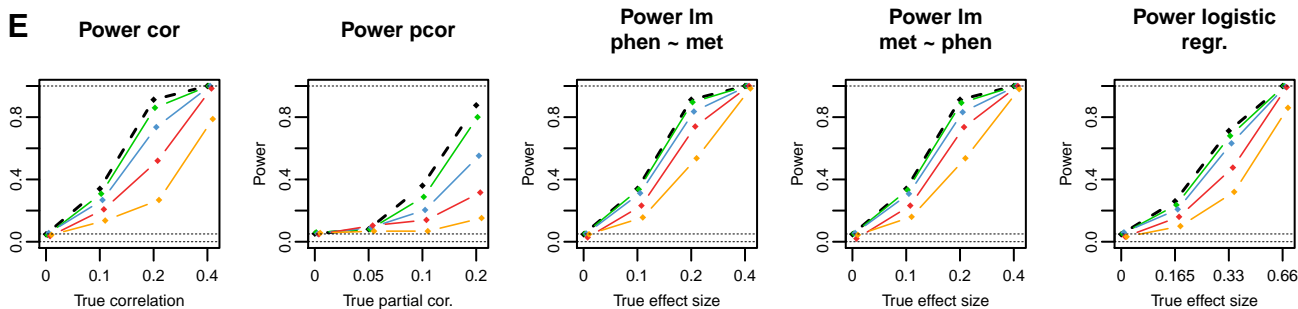
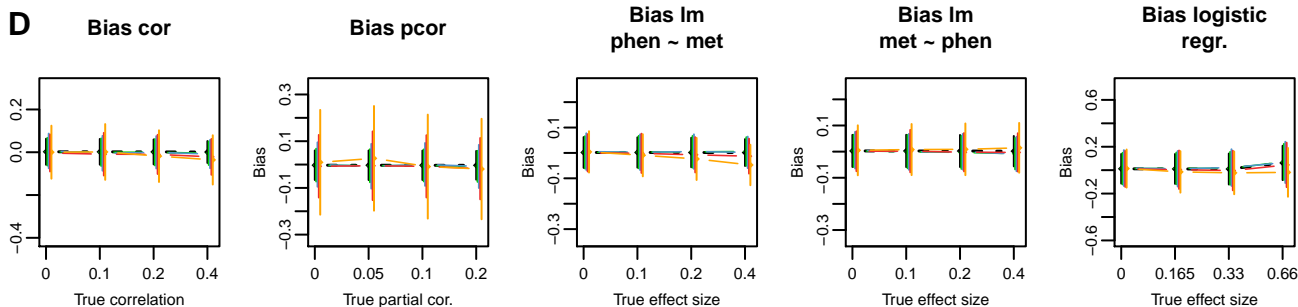
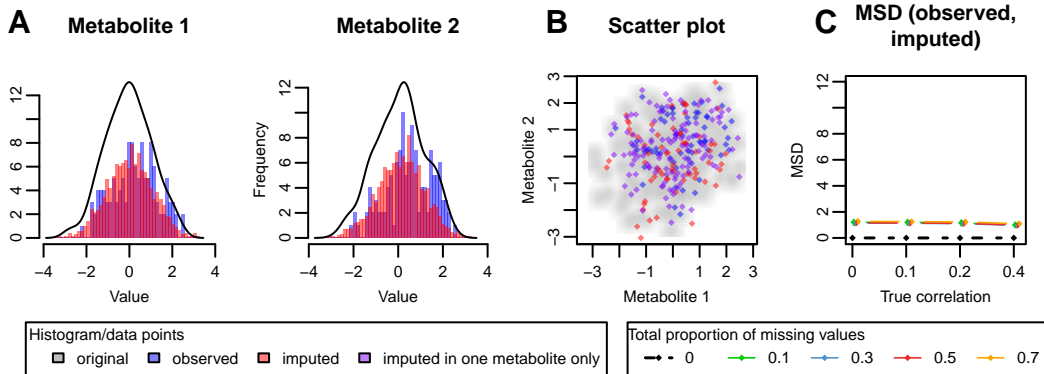


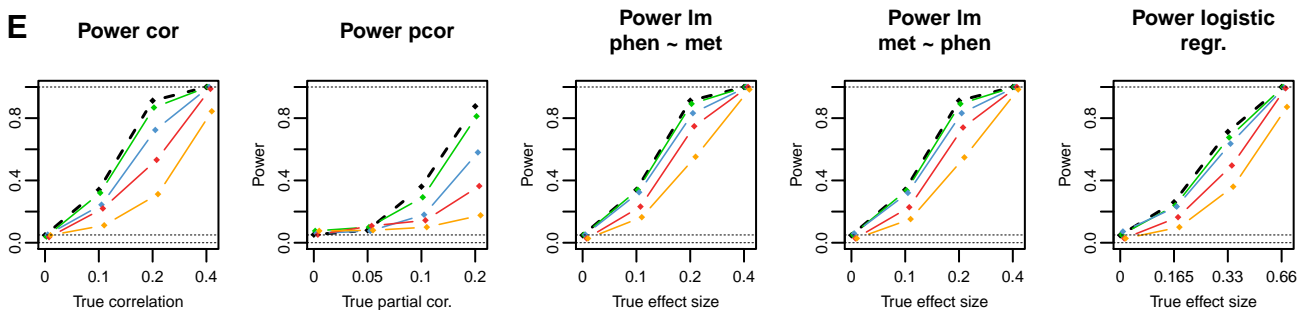
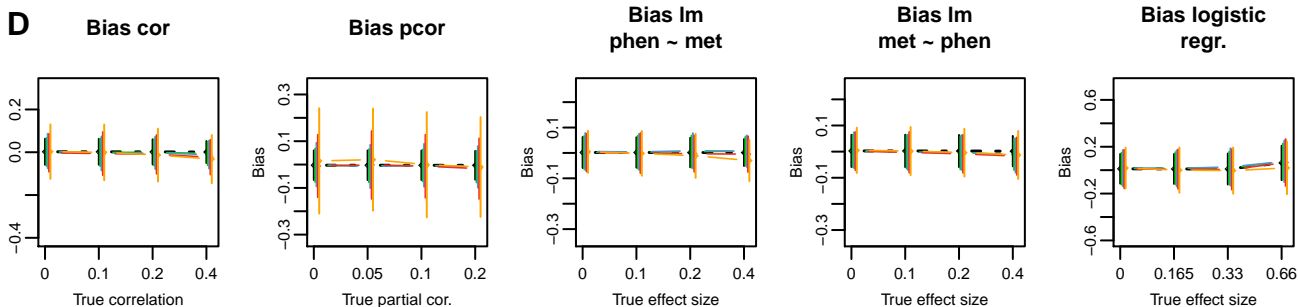
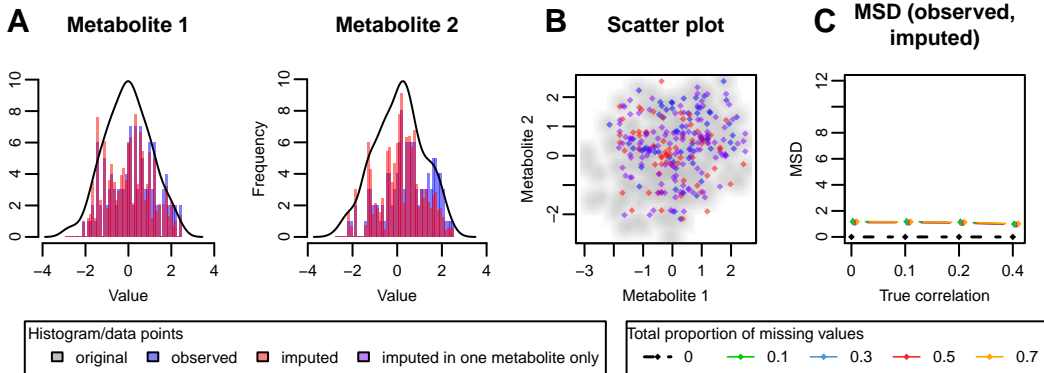


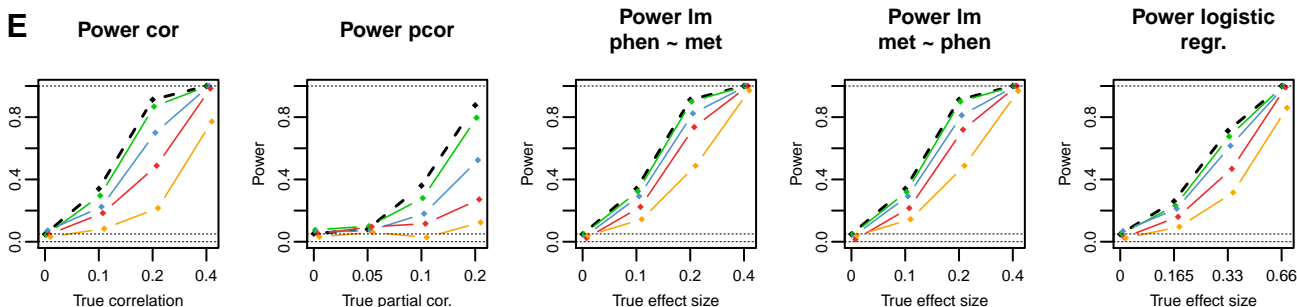
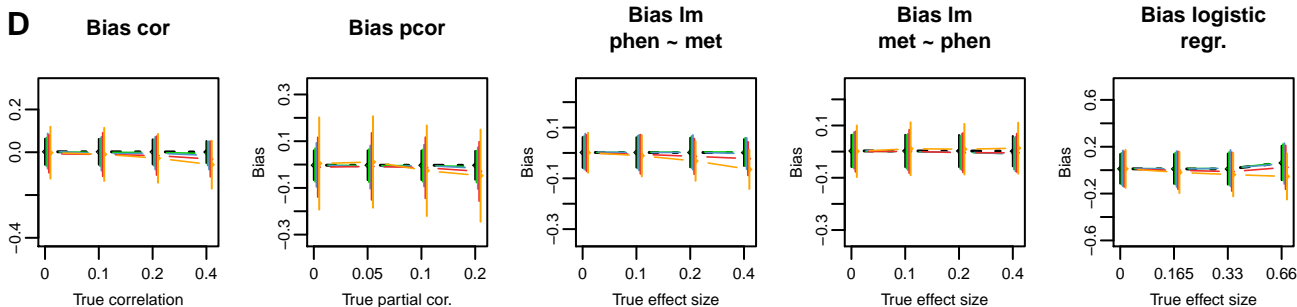
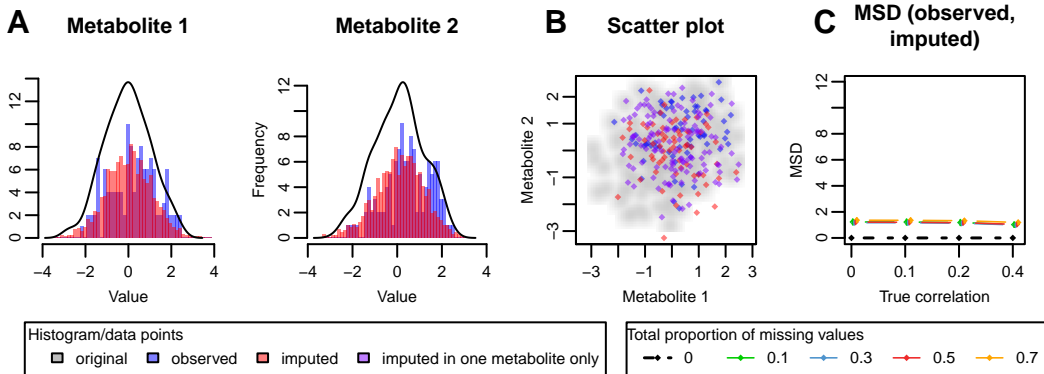




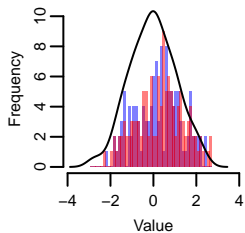




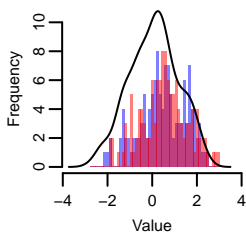




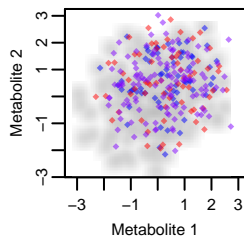
A Metabolite 1



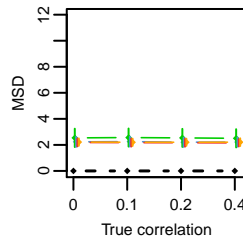
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



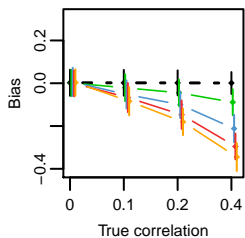
Histogram/data points

original observed imputed imputed in one metabolite only

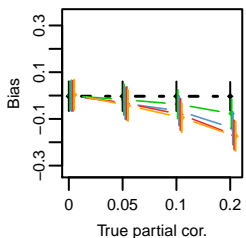
Total proportion of missing values

0 0.1 0.3 0.5 0.7

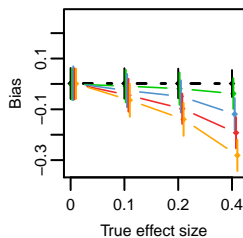
D Bias cor



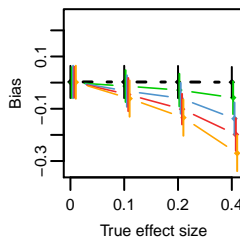
Bias pcor



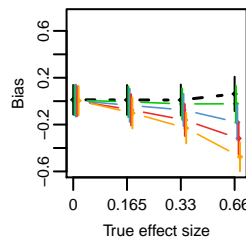
Bias lm phen ~ met



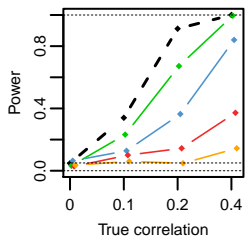
Bias lm met ~ phen



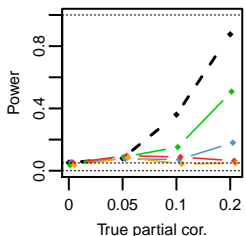
Bias logistic regr.



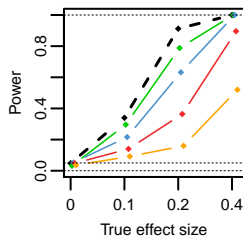
E Power cor



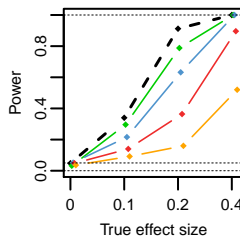
Power pcor



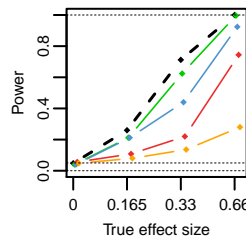
Power lm phen ~ met

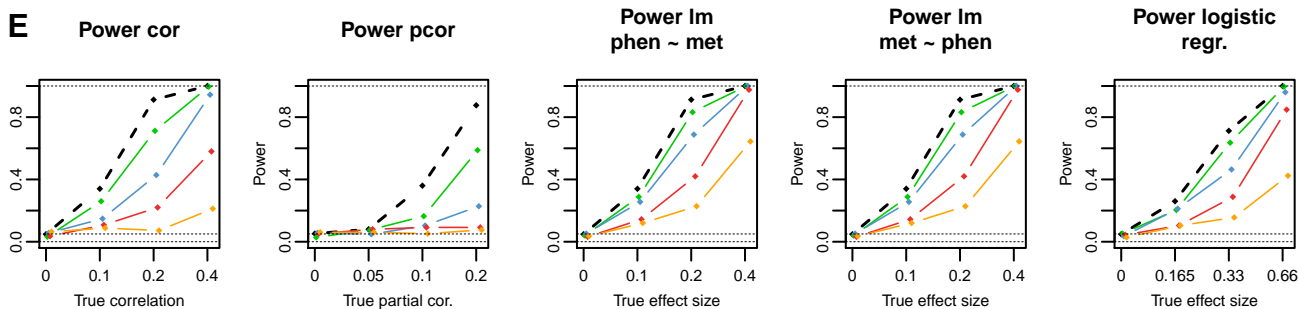
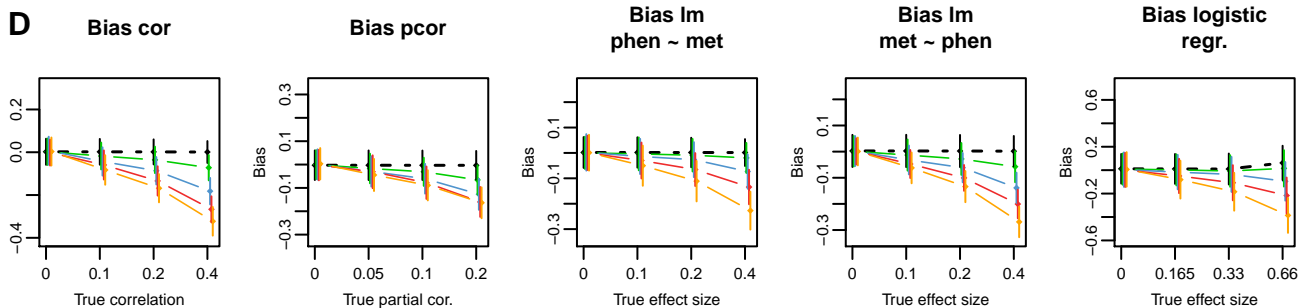
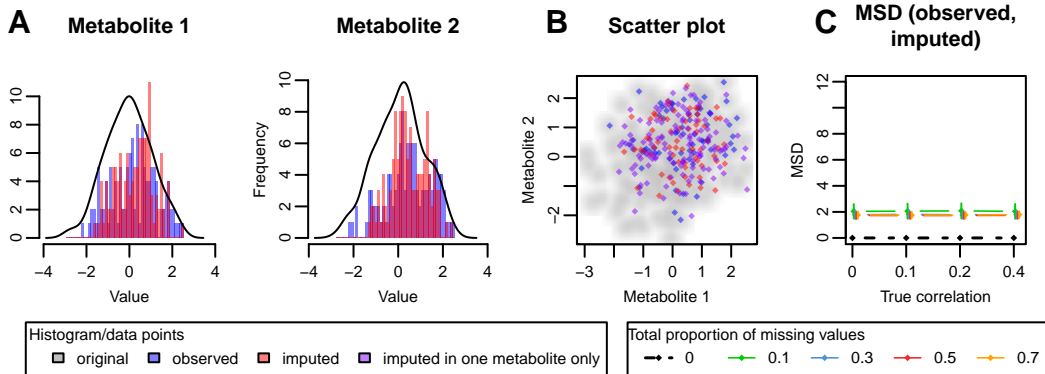


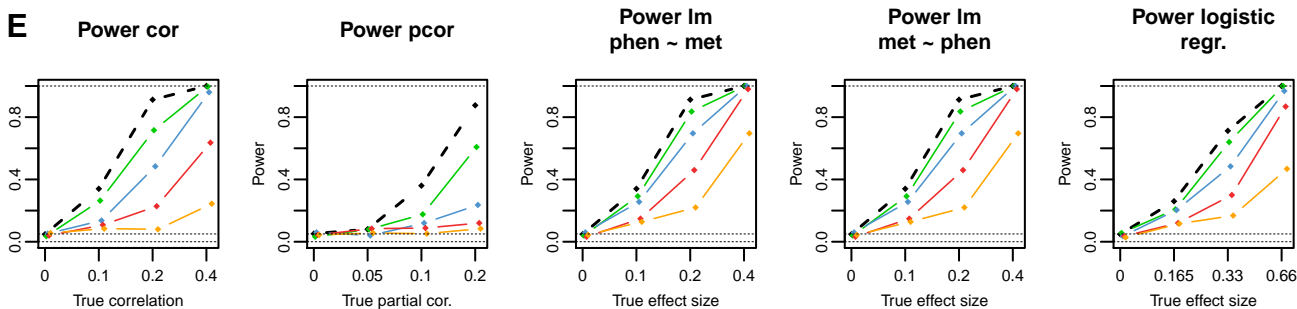
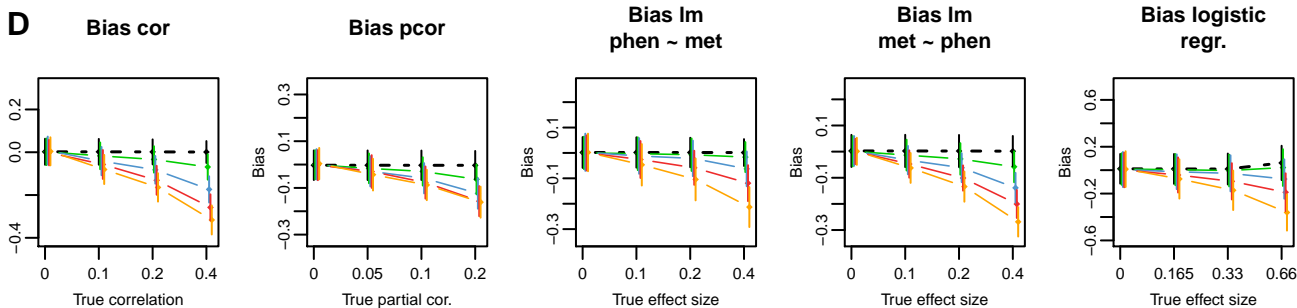
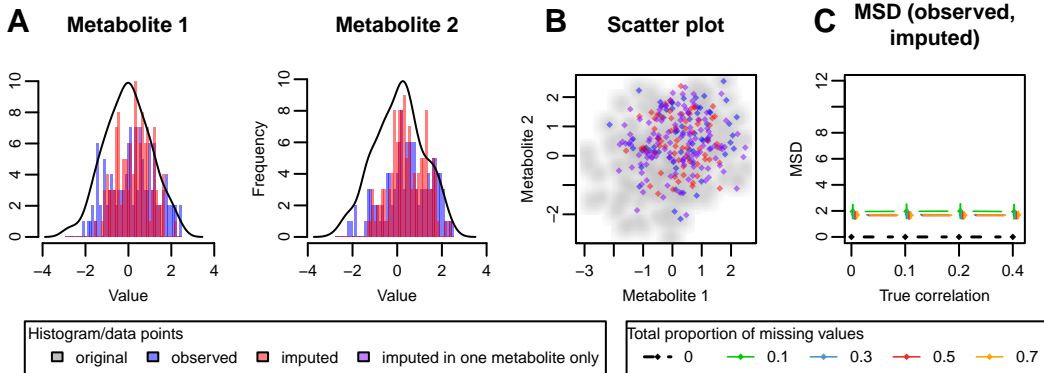
Power lm met ~ phen



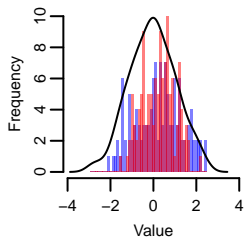
Power logistic regr.



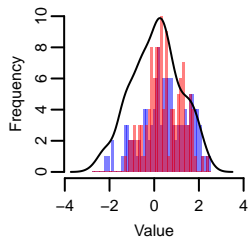




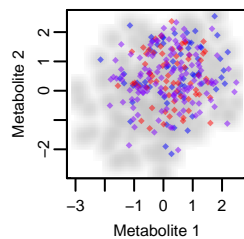
A Metabolite 1



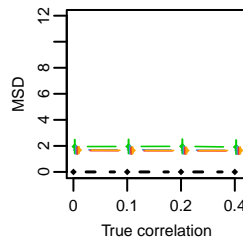
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



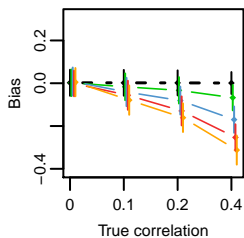
Histogram/data points

original observed imputed imputed in one metabolite only

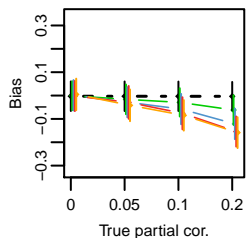
Total proportion of missing values

0 0.1 0.3 0.5 0.7

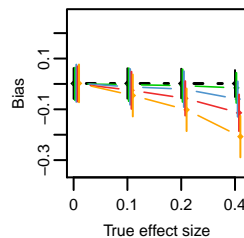
D Bias cor



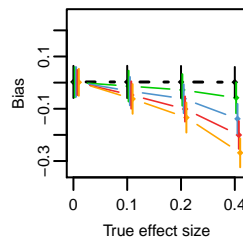
Bias pcor



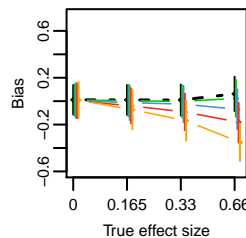
Bias lm phen ~ met



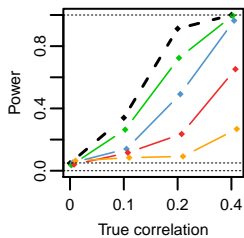
Bias lm met ~ phen



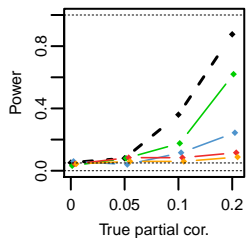
Bias logistic regr.



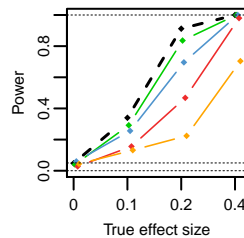
E Power cor



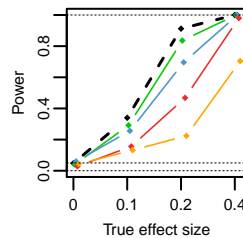
Power pcor



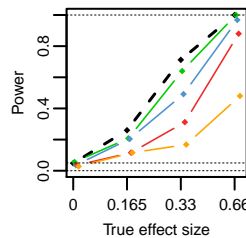
Power lm phen ~ met



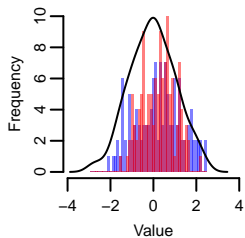
Power lm met ~ phen



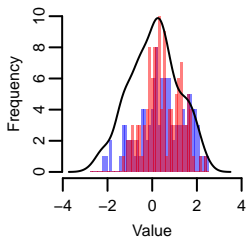
Power logistic regr.



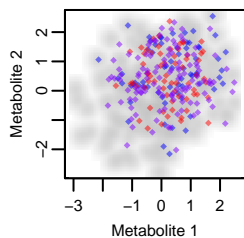
A Metabolite 1



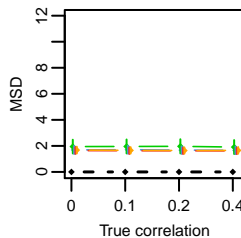
Metabolite 2



B Scatter plot



C MSD (observed, imputed)



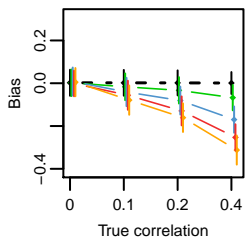
Histogram/data points

original observed imputed imputed in one metabolite only

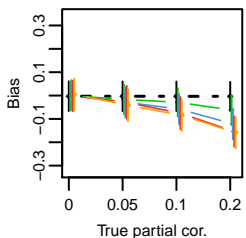
Total proportion of missing values

0 0.1 0.3 0.5 0.7

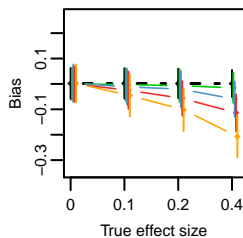
D Bias cor



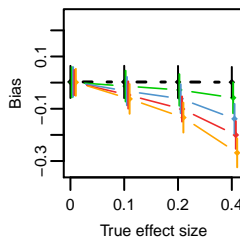
Bias pcor



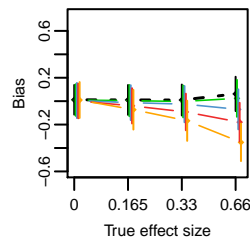
Bias lm phen ~ met



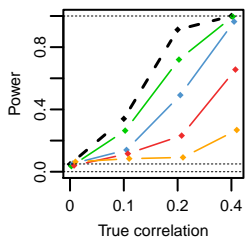
Bias lm met ~ phen



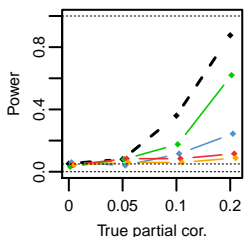
Bias logistic regr.



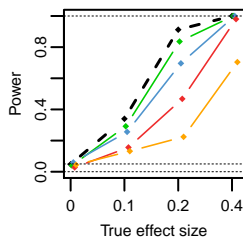
E Power cor



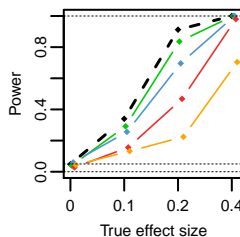
Power pcor



Power lm phen ~ met



Power lm met ~ phen



Power logistic regr.

