Supplemental Material

The specifics on generating the data for each simulation case are given below.

Let be the response for patient in subgroup with response rate and let be the vector of covariates for the same patient. Then throughout the simulations a patient’s response is generated as

with ,

where is the subgroup-specific regression parameter capturing a subgroup-specific covariate-response relationship.

Scenario 1, Homogenous Case:

In this case all the subgroups have the same covariate-response relationship with and the response rates for each subgroup are similar.

Subgroup 1:

for

Subgroup 2:

for

Subgroup 3:

for

Subgroup 4:

Scenario 2, Semi-homogenous Case:

In this case all the subgroups have the same covariate-response relationship with and three of the subgroups have similar response rates, but subgroup 2 has a larger response rate.

Subgroup 1:

for

Subgroup 2:

for

Subgroup 3:

for

Subgroup 4:

for

Scenario 3, Heterogeneous Case:

In this case all the subgroups have the same covariate-response relationship with but the response rate varies across all subgroups.

Subgroup 1:

for

Subgroup 2:

for

Subgroup 3:

for

Subgroup 4:

for

Scenario 4, Heterogeneous Case with Subgroup Specific Covariate-Response Relationships:

In this case all the subgroups have a different covariate-response relationship for , but the response rates are similar across subgroups.

Subgroup 1:

for

Subgroup 2:

for

Subgroup 3:

for

Subgroup 4:

for