Plotting all the results

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Jimmy needs to give me the right esitamte of effect right now here is what I am using

```
smaller_true_ATE <- 0.15
bigger_true_ATE <- 0.3

pos_beta <- 1
neg_beta <- -1
```

Loading Data

Compiling Binary Data

Get all the odd numbers $\beta_1 = 0.767$

```
binary_final_odd <-
  binary_scen_1 %>%
    mutate(n_sample = 1000, beta1 = 0.767, desired_prop = 0.1) %>%
  bind_rows(binary_scen_3 %>%
            mutate(n_sample = 1000, beta1 = 0.767, desired_prop = 0.2)) %>%
  bind_rows(binary_scen_5 %>%
            mutate(n_sample = 1000, beta1 = 0.767, desired_prop = 0.3)) %>%
  bind_rows(binary_scen_13 %>%
            mutate(n_sample = 100, beta1 = 0.767, desired_prop = 0.1)) %>%
  bind_rows(binary_scen_15 %>%
            mutate(n_sample = 100, beta1 = 0.767, desired_prop = 0.2)) %>%
  bind_rows(binary_scen_17 %>%
            mutate(n_sample = 100, beta1 = 0.767, desired_prop = 0.3))

binary_final_odd <- binary_final_odd %>%
  mutate(
    ATE_bias = ATE - smaller_true_ATE,
    empirical_bias = empirical_mean - smaller_true_ATE,
    boot_type = ifelse(boot_type == 0, "Simple", "Complex")
  )

rm(binary_scen_1, binary_scen_3, binary_scen_5,
   binary_scen_13, binary_scen_15, binary_scen_17)
```

Get all the even numbers $\beta_1 = 1.386$

```r
binary_final_even <-
  binary_scen_2 %>%
    mutate(n_sample = 1000, beta1 = 1.386, desired_prop = 0.1) %>%
  bind_rows(binary_scen_4 %>%
              mutate(n_sample = 1000, beta1 = 1.386, desired_prop = 0.2)) %>%
  bind_rows(binary_scen_6 %>%
              mutate(n_sample = 1000, beta1 = 1.386, desired_prop = 0.3)) %>%
  bind_rows(binary_scen_14 %>%
              mutate(n_sample = 100, beta1 = 1.386, desired_prop = 0.1)) %>%
  bind_rows(binary_scen_16 %>%
              mutate(n_sample = 100, beta1 = 1.386, desired_prop = 0.2)) %>%
  bind_rows(binary_scen_18 %>%
              mutate(n_sample = 100, beta1 = 1.386, desired_prop = 0.3))


binary_final_even <- binary_final_even %>%
  mutate(
    ATE_bias = ATE - bigger_true_ATE,
    empirical_bias = empirical_mean - bigger_true_ATE,
    boot_type = ifelse(boot_type == 0, "Simple", "Complex")
  )

rm(binary_scen_2, binary_scen_4, binary_scen_6,
   binary_scen_14, binary_scen_16, binary_scen_18)
```

```r
binary_final <- binary_final_even %>% bind_rows(binary_final_odd)
```

Compiling Continuous Data

```r
continuous_final_odd <-
  cont_df_scen_1 %>%
    mutate(n_sample = 1000, beta1 = pos_beta, desired_prop = 0.1) %>%
  bind_rows(cont_df_scen_3 %>%
              mutate(n_sample = 1000, beta1 = pos_beta, desired_prop = 0.2)) %>%
  bind_rows(cont_df_scen_5 %>%
              mutate(n_sample = 1000, beta1 = pos_beta, desired_prop = 0.3)) %>%
  bind_rows(cont_df_scen_13 %>%
              mutate(n_sample = 100, beta1 = pos_beta, desired_prop = 0.1)) %>%
  bind_rows(cont_df_scen_15 %>%
              mutate(n_sample = 100, beta1 = pos_beta, desired_prop = 0.2)) %>%
  bind_rows(cont_df_scen_17 %>%
              mutate(n_sample = 100, beta1 = pos_beta, desired_prop = 0.3)) %>%
  mutate(
    ATE_bias = ATE - pos_beta,
    empirical_bias = empirical_mean - pos_beta,
    boot_type = ifelse(boot_type == 0, "Simple", "Complex")
  )

rm(cont_df_scen_1, cont_df_scen_3, cont_df_scen_5,
   cont_df_scen_13, cont_df_scen_15, cont_df_scen_17)
```

```r
continuous_final_even <-
  cont_df_scen_2 %>%
    mutate(n_sample = 1000, beta1 = neg_beta, desired_prop = 0.1) %>%
  bind_rows(cont_df_scen_4 %>%
              mutate(n_sample = 1000, beta1 = neg_beta, desired_prop = 0.2)) %>%
  bind_rows(cont_df_scen_6 %>%
              mutate(n_sample = 1000, beta1 = neg_beta, desired_prop = 0.3)) %>%
  bind_rows(cont_df_scen_14 %>%
              mutate(n_sample = 100, beta1 = neg_beta, desired_prop = 0.1)) %>%
  bind_rows(cont_df_scen_16 %>%
              mutate(n_sample = 100, beta1 = neg_beta, desired_prop = 0.2)) %>%
  bind_rows(cont_df_scen_18 %>%
              mutate(n_sample = 100, beta1 = neg_beta, desired_prop = 0.3)) %>%
  mutate(
    ATE_bias = ATE - neg_beta,
    empirical_bias = empirical_mean - neg_beta,
    boot_type = ifelse(boot_type == 0, "Simple", "Complex")
  )

rm(cont_df_scen_2, cont_df_scen_4, cont_df_scen_6,
   cont_df_scen_14, cont_df_scen_16, cont_df_scen_18)
```

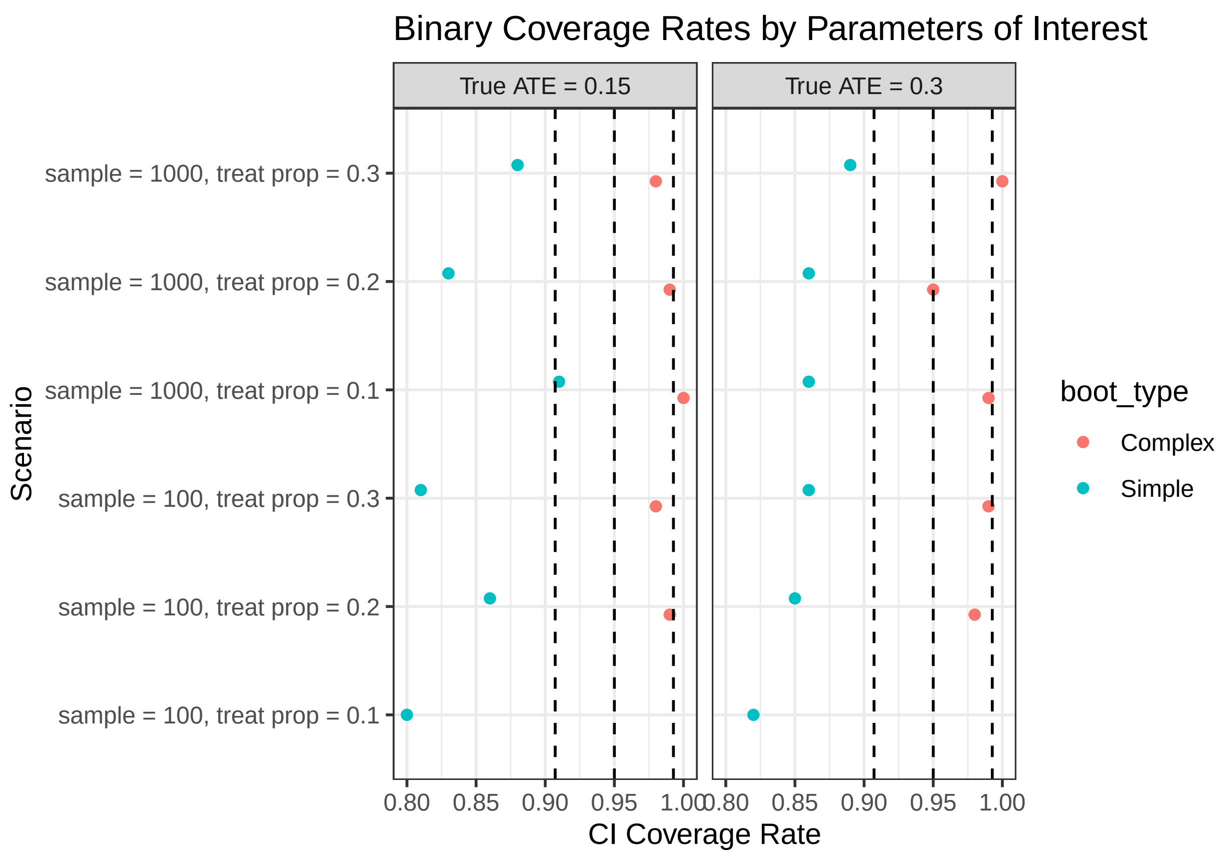
```r
continuous_final <-
  continuous_final_odd %>%
  bind_rows(continuous_final_even)

rm(continuous_final_even, continuous_final_odd)
```

Binary Coverage Rates

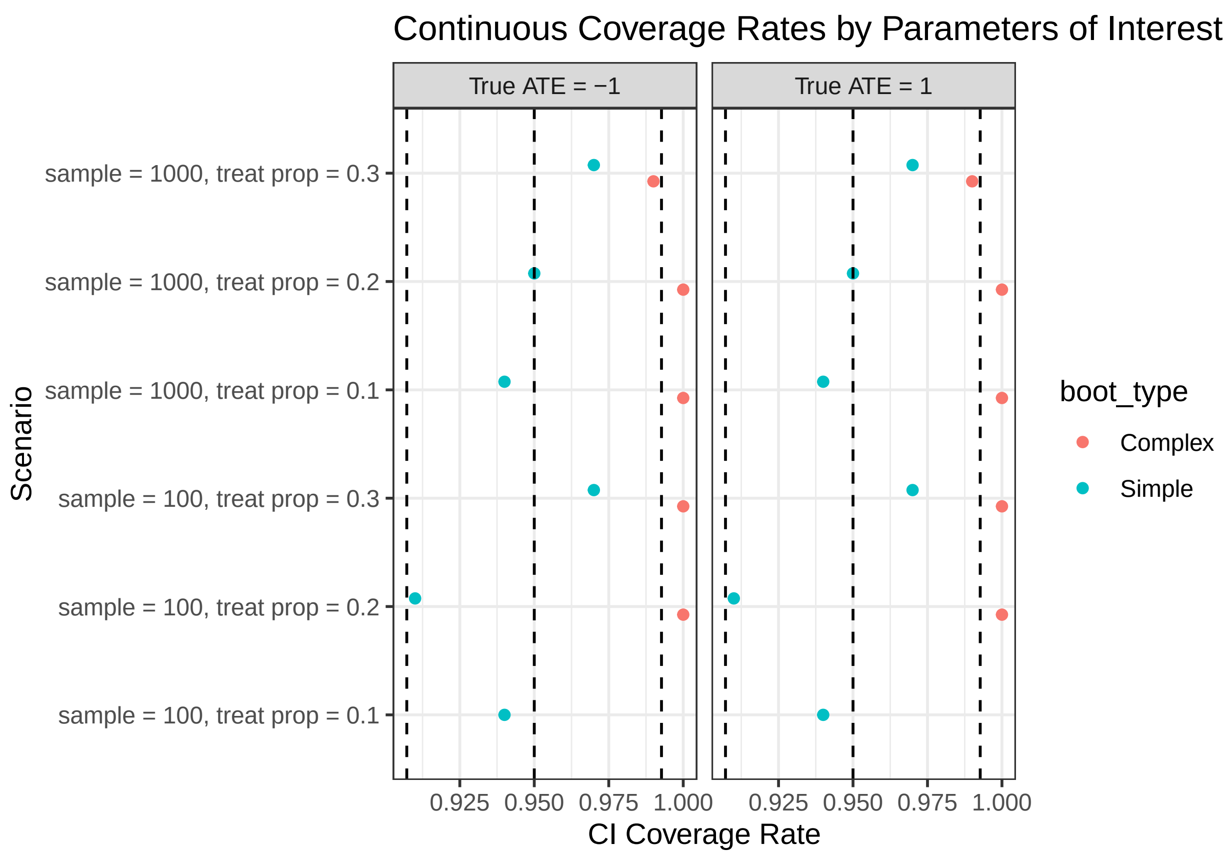
```
## `summarise()` has grouped output by 'new_name', 'treat_effect'. You can override
## using the `.groups` argument.
```

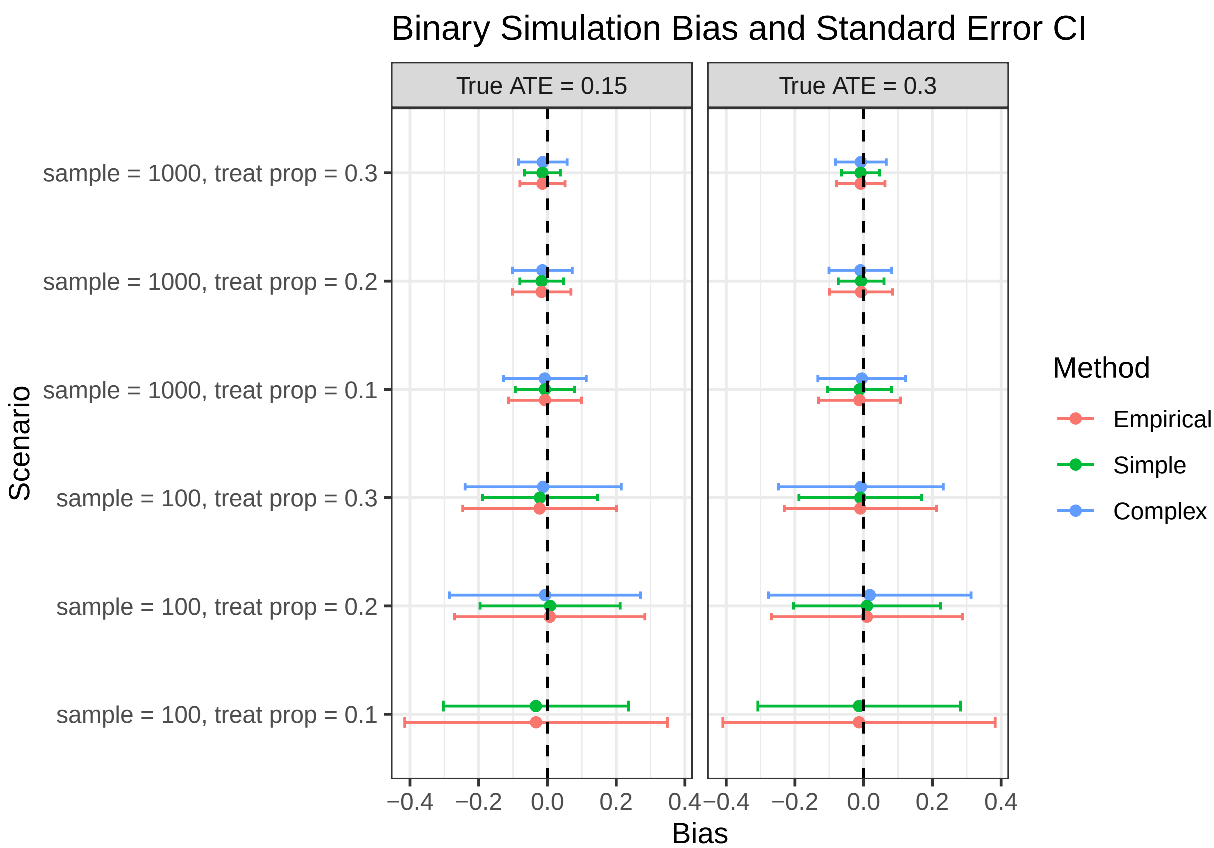
name the scenarios by sample size and treat prop and facet by the treatment effect



Continuous Coverage Rates

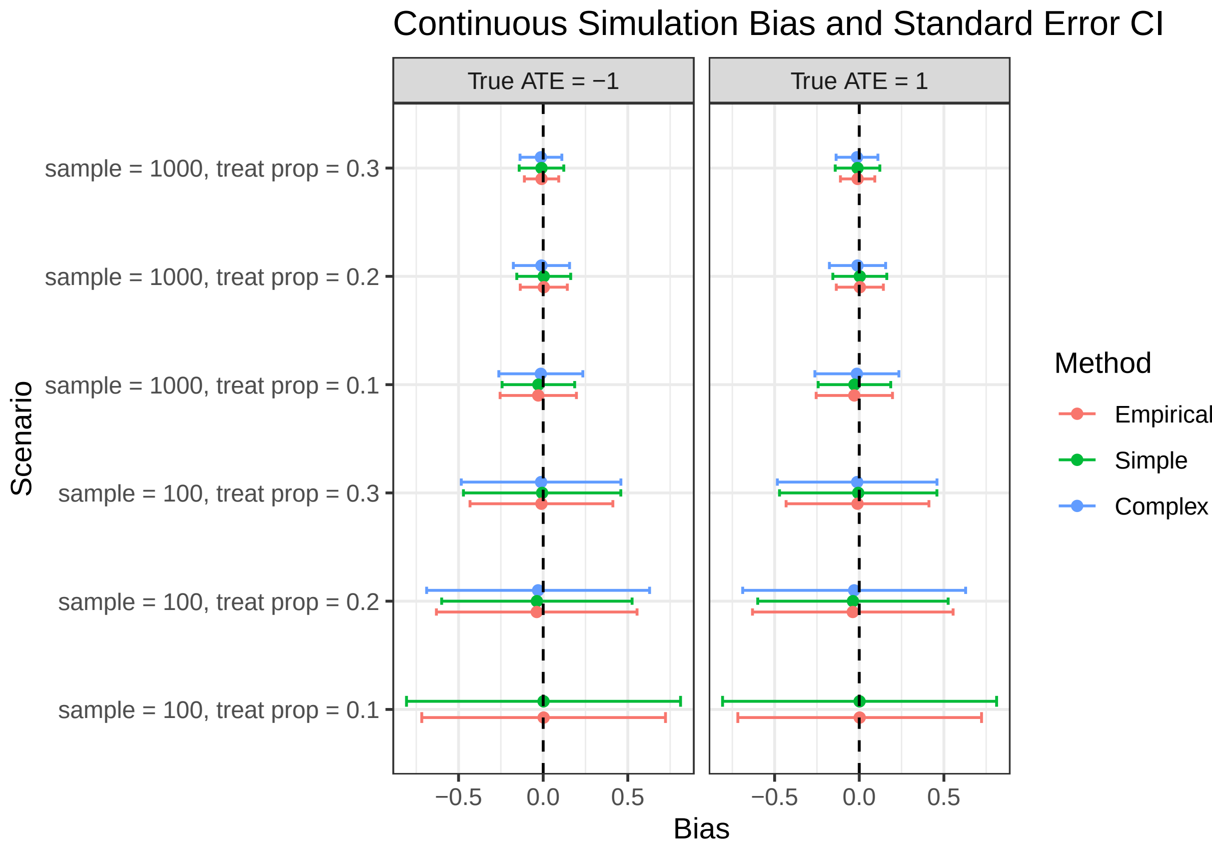
```
## `summarise()` has grouped output by 'new_name', 'treat_effect'. You can override
## using the `.groups` argument.
```


Continuous Coverage Rates by Parameters of Interest
True ATE = −1
True ATE = 1
Scenario
sample = 1000, treat prop = 0.3
sample = 1000, treat prop = 0.2
sample = 1000, treat prop = 0.1
sample = 100, treat prop = 0.3
sample = 100, treat prop = 0.2
sample = 100, treat prop = 0.1
0.925 0.950 0.975 1.000
CI Coverage Rate
boot_type
Complex
Simple



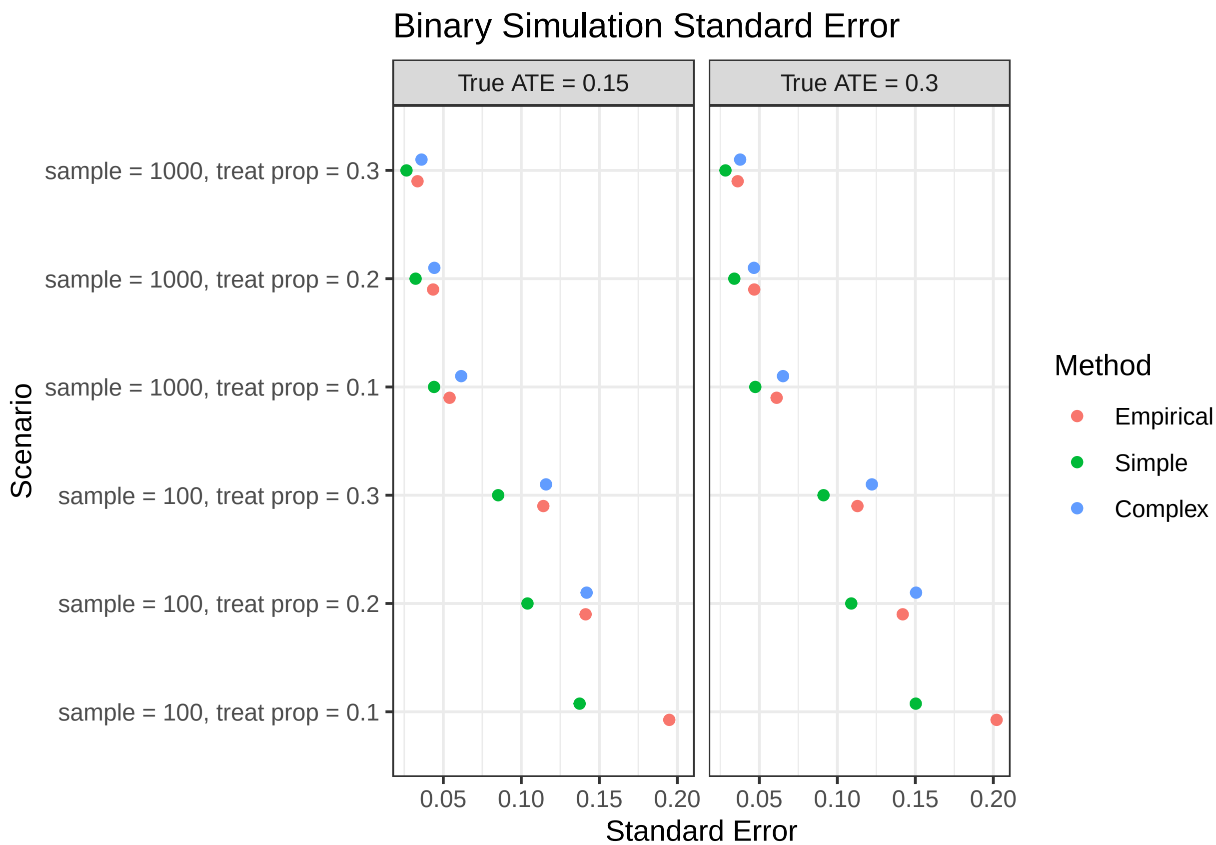
Binary Simulation Bias and Standard Error CI
True ATE = 0.15
True ATE = 0.3
Scenario
sample = 1000, treat prop = 0.3
sample = 1000, treat prop = 0.2
sample = 1000, treat prop = 0.1
sample = 100, treat prop = 0.3
sample = 100, treat prop = 0.2
sample = 100, treat prop = 0.1
−0.4 −0.2 0.0 0.2 0.4
−0.4 −0.2 0.0 0.2 0.4
Bias
Method
Empirical
Simple
Complex

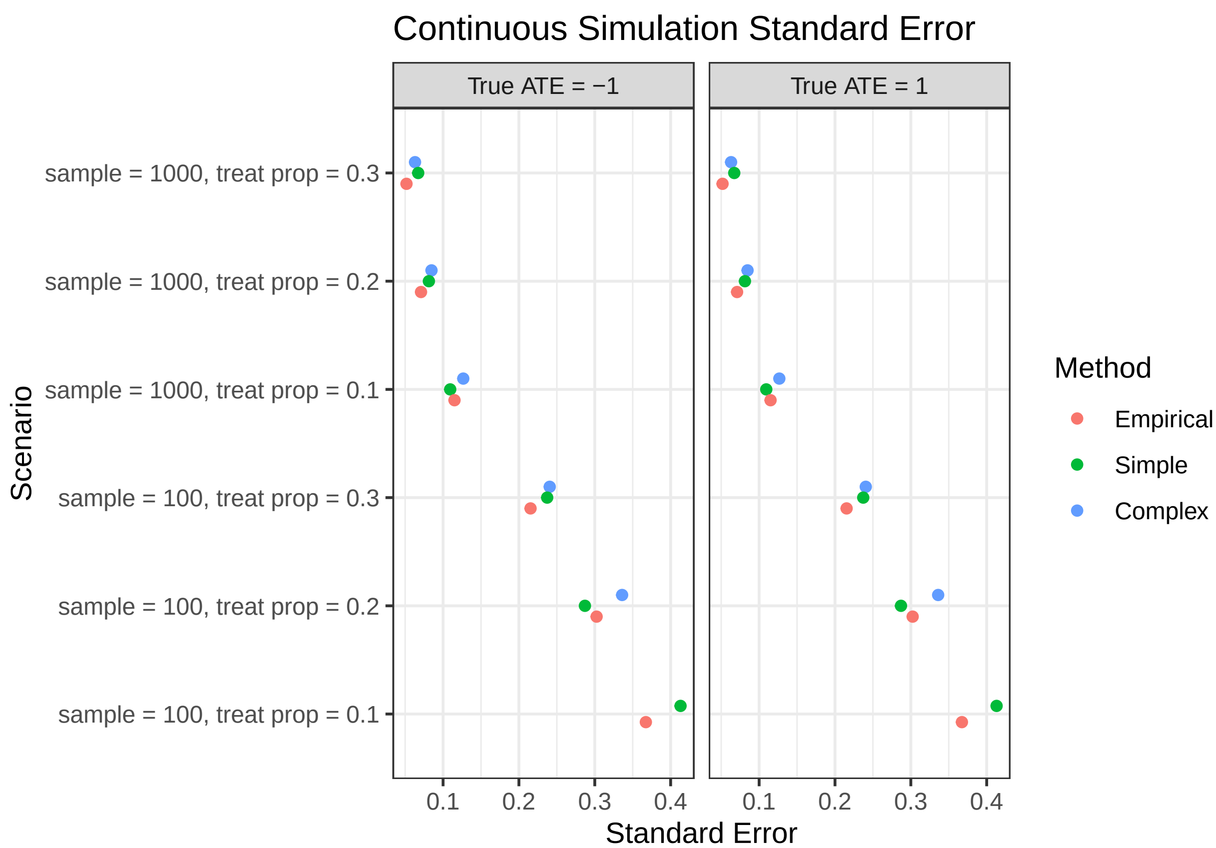
Bias



Continuous Simulation Bias and Standard Error CI
True ATE = −1
True ATE = 1
Scenario
sample = 1000, treat prop = 0.3
sample = 1000, treat prop = 0.2
sample = 1000, treat prop = 0.1
sample = 100, treat prop = 0.3
sample = 100, treat prop = 0.2
sample = 100, treat prop = 0.1
−0.5
0.0
0.5
Bias
Method
Empirical
Simple
Complex

Standard Error




Continuous Simulation Standard Error
True ATE = −1
True ATE = 1
Scenario
sample = 1000, treat prop = 0.3
sample = 1000, treat prop = 0.2
sample = 1000, treat prop = 0.1
sample = 100, treat prop = 0.3
sample = 100, treat prop = 0.2
sample = 100, treat prop = 0.1
0.1
0.2
0.3
0.4
Standard Error
Method
Empirical
Simple
Complex

Binary Outcome	Empirical		Simple			Complex		
Scenario	E_SE	E_Bias	S_SE	S_Bias	S_CR	C_SE	C_Bias	C_CR
Large Sample, ATE = 0.15, p = 0.1	**0.115**	**-0.029**	**0.054**	**-0.007**	**0.91**	**0.036**	**-0.008**	**1.00**
Large Sample, ATE = 0.15, p = 0.2	**0.071**	**0.004**	**0.043**	**-0.017**	**0.83**	**0.030**	**-0.015**	**0.99**
Large Sample, ATE = 0.15, p = 0.3	**0.052**	**-0.010**	**0.033**	**-0.014**	**0.88**	**0.028**	**-0.013**	**0.98**
Large Sample, ATE = 0.30, p = 0.1	**0.115**	**-0.029**	**0.061**	**-0.012**	**0.86**	**0.052**	**-0.005**	**0.99**
Large Sample, ATE = 0.30, p = 0.2	**0.071**	**0.004**	**0.047**	**-0.007**	**0.86**	**0.042**	**-0.010**	**0.95**
Large Sample, ATE = 0.30, p = 0.3	**0.052**	**-0.010**	**0.036**	**-0.009**	**0.89**	**0.032**	**-0.008**	**1.00**
Small Sample, ATE = 0.15, p = 0.1	**0.367**	**0.003**	**0.194**	**-0.034**	**0.80**	**NA**	**NA**	**NA**
Small Sample, ATE = 0.15, p = 0.2	**0.302**	**-0.038**	**0.140**	**0.008**	**0.86**	**0.109**	**-0.007**	**0.99**
Small Sample, ATE = 0.15, p = 0.3	**0.215**	**-0.010**	**0.115**	**-0.022**	**0.81**	**0.103**	**-0.013**	**0.98**
Small Sample, ATE = 0.30, p = 0.1	**0.367**	**0.003**	**0.202**	**-0.013**	**0.82**	**NA**	**NA**	**NA**
Small Sample, ATE = 0.30, p = 0.2	**0.302**	**-0.038**	**0.142**	**0.010**	**0.85**	**0.112**	**0.018**	**0.98**
Small Sample, ATE = 0.30, p = 0.3	**0.215**	**-0.010**	**0.113**	**-0.010**	**0.86**	**0.099**	**-0.008**	**0.99**

Continuous Outcome	Empirical		Simple			Complex		
Scenario	E_SE	E_Bias	S_SE	S_Bias	S_CR	C_SE	C_Bias	C_CR
Large Sample, ATE = +1, p = 0.1	**0.115**	**-0.029**	**0.114**	**-0.028**	**0.94**	**0.054**	**-0.014**	**1.00**
Large Sample, ATE = +1, p = 0.2	**0.071**	**0.004**	**0.071**	**0.003**	**0.95**	**0.041**	**-0.010**	**1.00**
Large Sample, ATE = +1, p = 0.3	**0.052**	**-0.010**	**0.052**	**-0.010**	**0.97**	**0.034**	**-0.013**	**0.99**
Large Sample, ATE = -1, p = 0.1	**0.115**	**-0.029**	**0.114**	**-0.028**	**0.94**	**0.054**	**-0.014**	**1.00**
Large Sample, ATE = -1, p = 0.2	**0.071**	**0.004**	**0.071**	**0.003**	**0.95**	**0.041**	**-0.010**	**1.00**
Large Sample, ATE = -1, p = 0.3	**0.052**	**-0.010**	**0.052**	**-0.010**	**0.97**	**0.034**	**-0.013**	**0.99**
Small Sample, ATE = +1, p = 0.1	**0.367**	**0.003**	**0.367**	**0.002**	**0.94**	**NA**	**NA**	**NA**
Small Sample, ATE = +1, p = 0.2	**0.302**	**-0.038**	**0.302**	**-0.037**	**0.91**	**0.138**	**-0.030**	**1.00**
Small Sample, ATE = +1, p = 0.3	**0.215**	**-0.010**	**0.218**	**-0.006**	**0.97**	**0.115**	**-0.012**	**1.00**
Small Sample, ATE = -1, p = 0.1	**0.367**	**0.003**	**0.367**	**0.002**	**0.94**	**NA**	**NA**	**NA**
Small Sample, ATE = -1, p = 0.2	**0.302**	**-0.038**	**0.302**	**-0.037**	**0.91**	**0.138**	**-0.030**	**1.00**
Small Sample, ATE = -1, p = 0.3	**0.215**	**-0.010**	**0.218**	**-0.006**	**0.97**	**0.115**	**-0.012**	**1.00**