Plotting all the results

Amy Pitts

2/19/2022

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 $\beta_1 = 1.587$

```
binary_final_even <-
  binary_scen_2 %>% mutate(n_sample = 1000, beta1 = 1.587, desired_prop = 0.1) %>%
  bind_rows(binary_scen_4 %>% mutate(n_sample = 1000, beta1 = 1.587, desired_prop = 0.2)) %>%
  bind_rows(binary_scen_6 %>% mutate(n_sample = 1000, beta1 = 1.587, desired_prop = 0.3)) %>%
  bind_rows(binary_scen_14 %>% mutate(n_sample = 100, beta1 = 1.587, desired_prop = 0.1)) %>%
  bind_rows(binary_scen_16 %>% mutate(n_sample = 100, beta1 = 1.587, desired_prop = 0.2)) %>%
  bind_rows(binary_scen_18 %>% mutate(n_sample = 100, beta1 = 1.587, 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)
```

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

Compiling Continuous Data

```
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)
```

```
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)
```

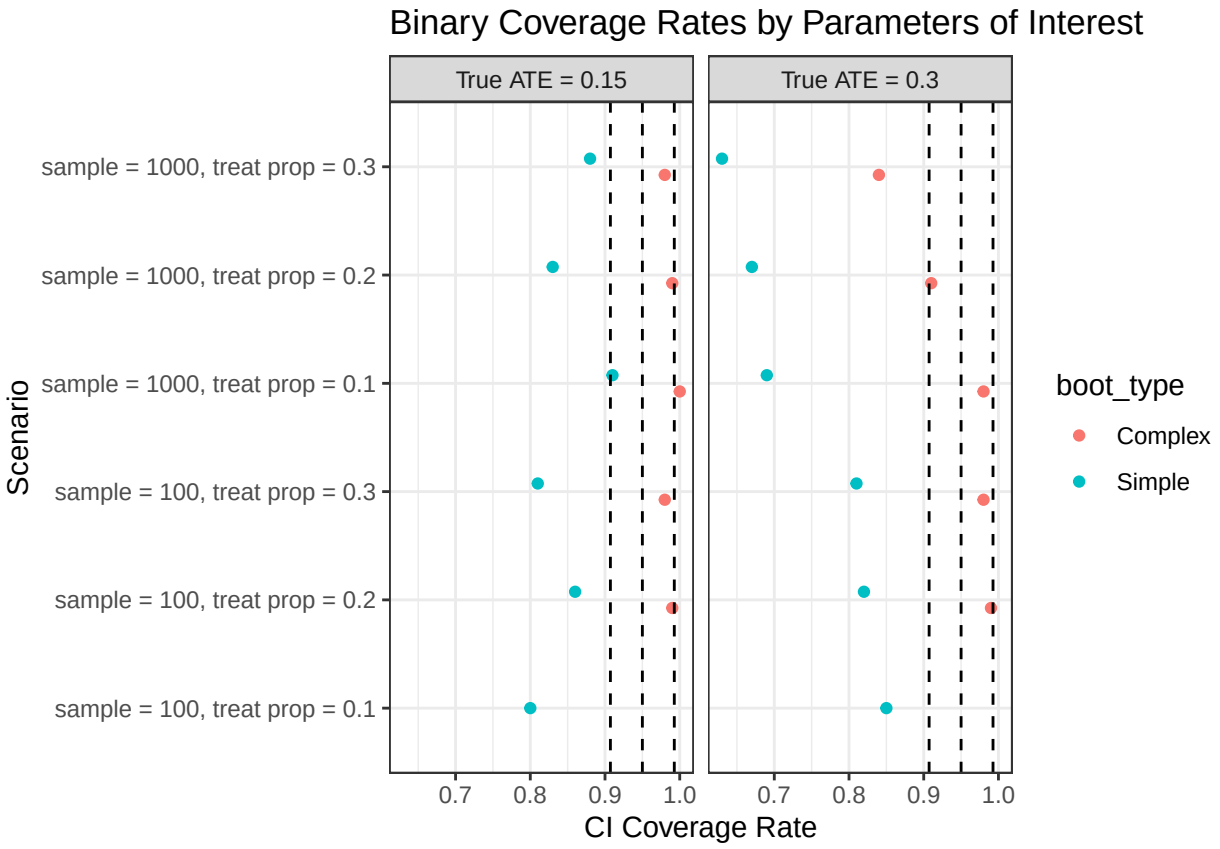
```
continuous_final <-
  continuous_final_odd %>%
  bind_rows(continuous_final_even)

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`
```

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

```
ggplot(cr_df, aes(x=cr, y=new_name, color=boot_type)) +
  geom_point(position=position_dodge(0.3))+
  geom_vline(xintercept=0.9927, linetype="dashed", color = "black") +
   geom_vline(xintercept=0.9072, linetype="dashed", color = "black") +
   geom_vline(xintercept=0.95, linetype="dashed", color = "black") +
  facet_grid(~treat_effect) +
  labs(
   title = "Binary Coverage Rates by Parameters of Interest",
   y = "Scenario",
   x = "CI Coverage Rate"
  )+theme_bw()
```

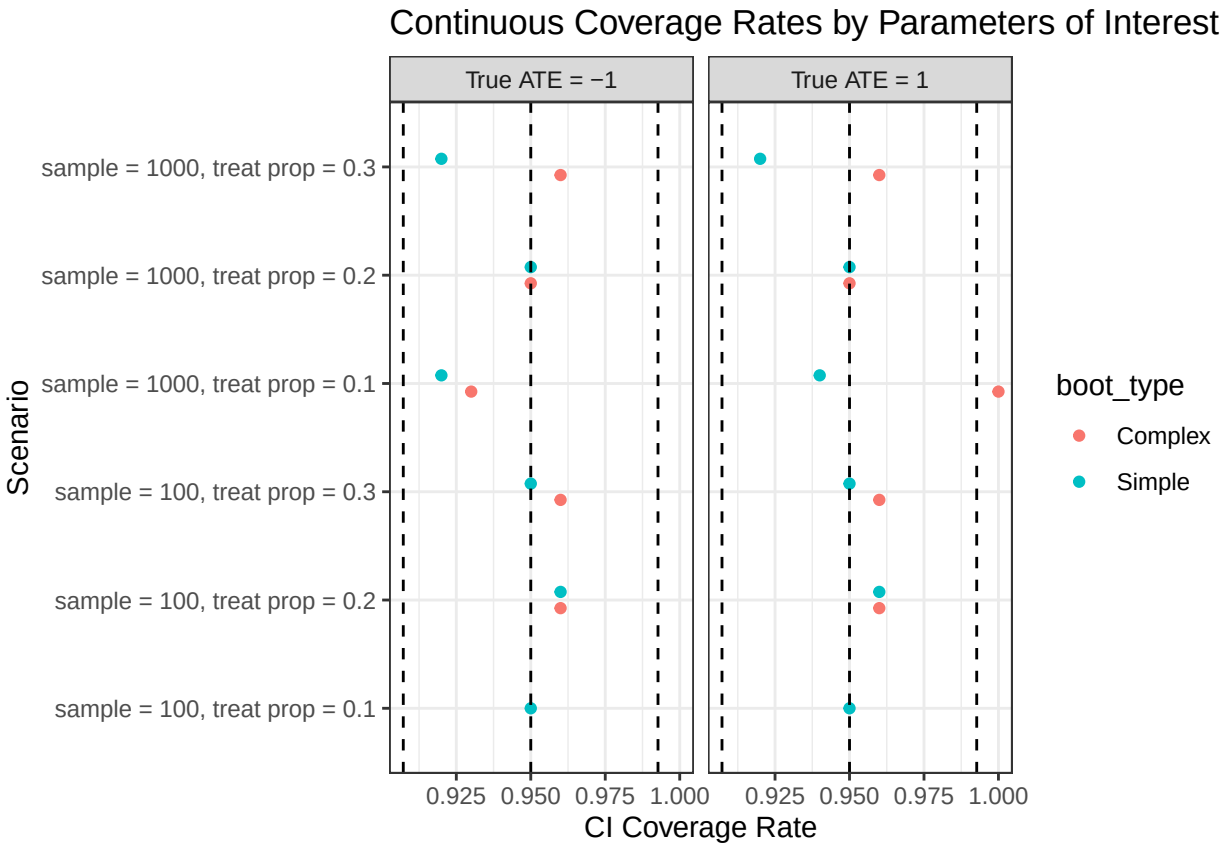


Continuous Coverage Rates

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

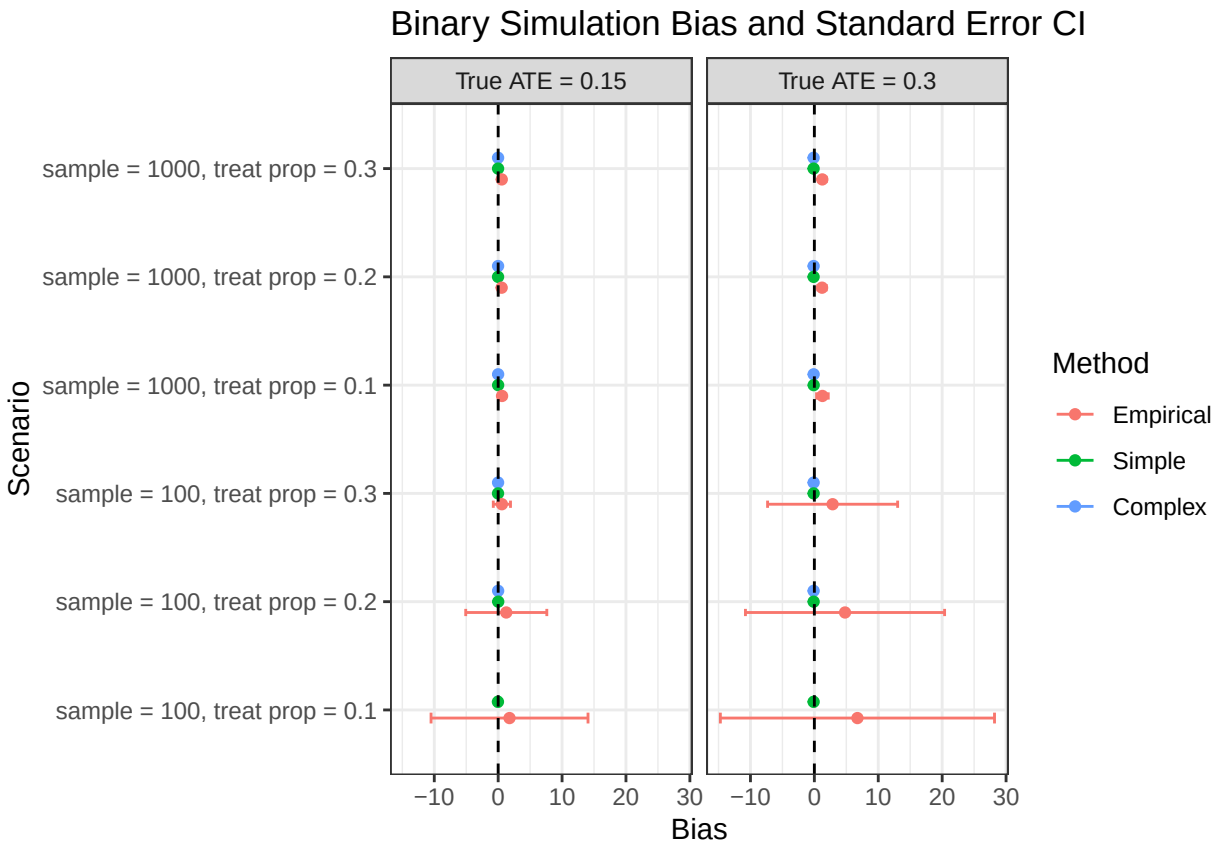
```
ggplot(cr_df_cont, aes(x=cr, y=new_name, color=boot_type)) +
  geom_point(position=position_dodge(0.3))+
```

```
 geom_vline(xintercept=0.9927, linetype="dashed", color = "black") +
  geom_vline(xintercept=0.9072, linetype="dashed", color = "black") +
  geom_vline(xintercept=0.95, linetype="dashed", color = "black") +
 facet_grid(~treat_effect) +
 labs(
  title = "Continuous Coverage Rates by Parameters of Interest",
  y = "Scenario",
  x = "CI Coverage Rate"
 )+theme_bw()
```

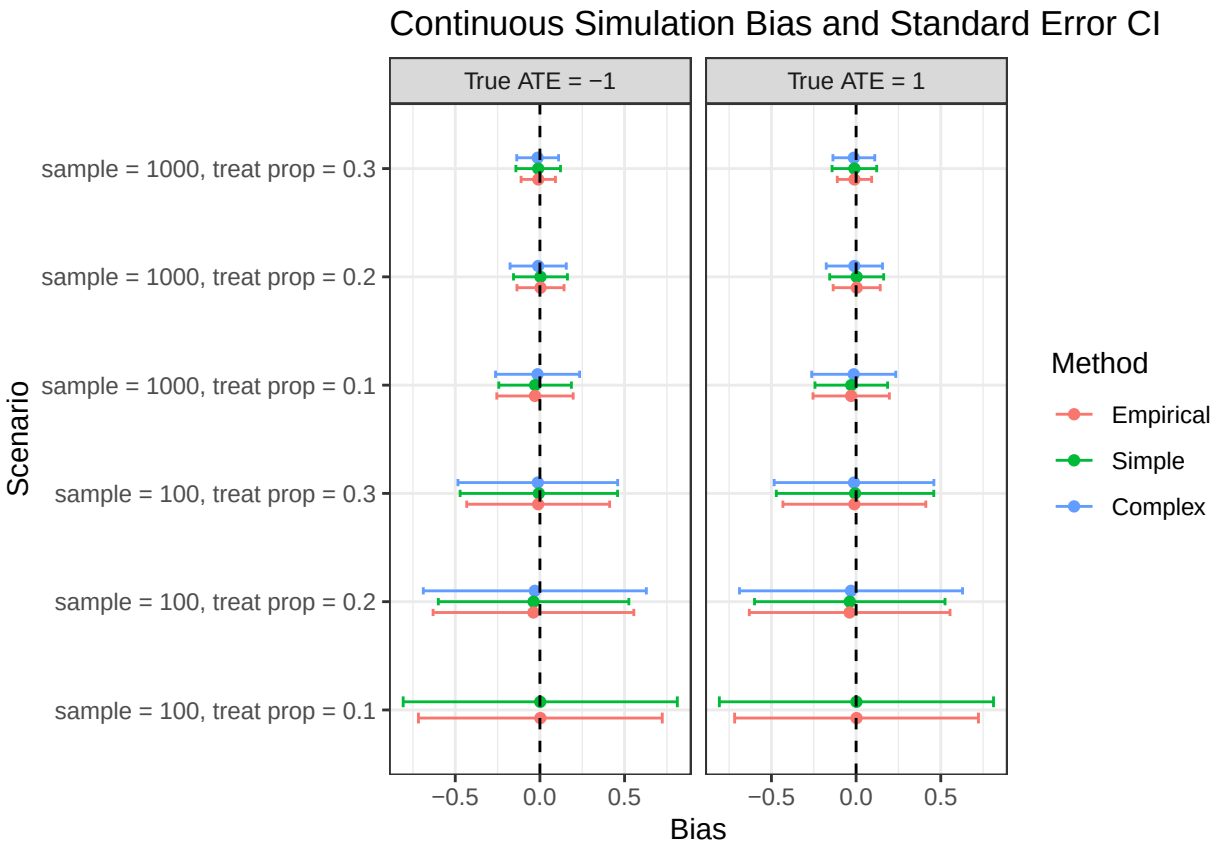


Bias

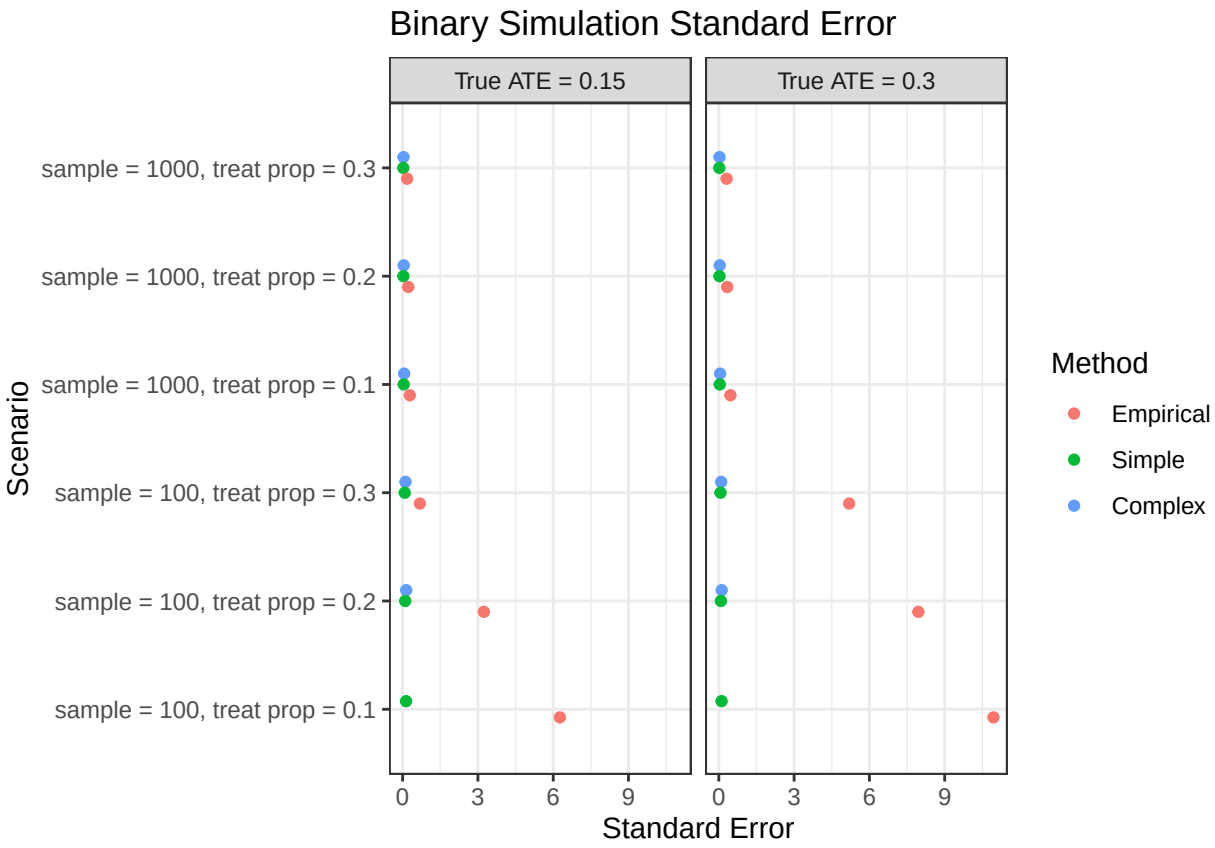
```
## `summarise()` has grouped output by 'Method', 'scenario', 'new_name'. You can override using the `.g
```

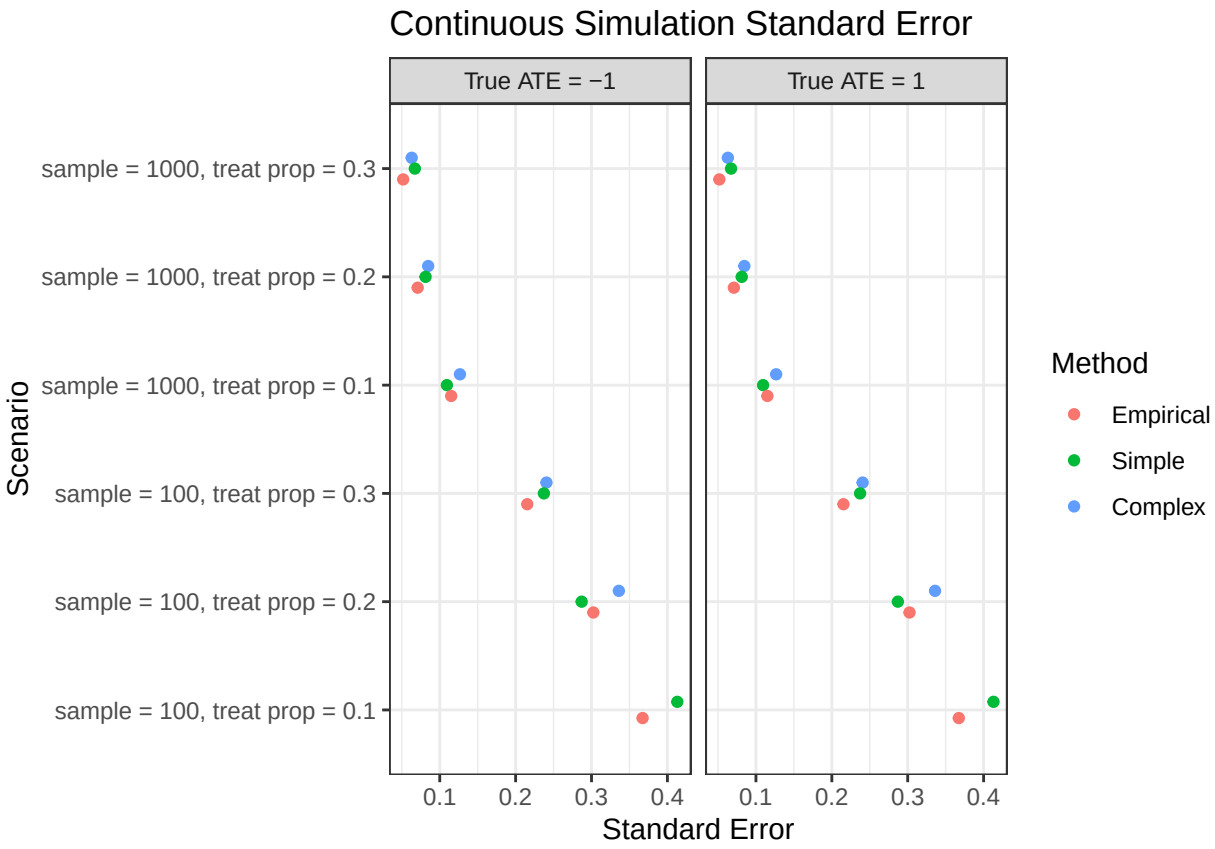



```
## `summarise()` has grouped output by 'Method', 'scenario', 'new_name'. You can override using the `.g
```


Continuous Simulation Bias and Standard Error CI
True ATE = −1
True ATE = 1
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
Scenario
−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