

T2D

2024-10-18

Proportion dead

We consider three different scenarios: where the effect of the drug on Death is 0, -0.1 and -0.2 . The effect of A_0 on T2D is let to vary from -2.5 to 0. The effect of L_0 on T2D is large ($= 2$). And the effect of T2D on death is moderate ($= 1$). There is no effect of L_0 directly on death.

```
N <- 1.5 * 10^4

estimator2 <- function(data, N) {
  # T2D events
  T2D_events <- data[Delta == 3]
  # T2D people
  T2D_peeps <- data[ID %in% T2D_events$ID]

  # Setting T_0 to debut time of diabetes
  T2D_peeps[, Time_T2D := Time - min(Time), by = ID]
  # Removing the new Time 0
  T2D_peeps <- T2D_peeps[Delta != 3]

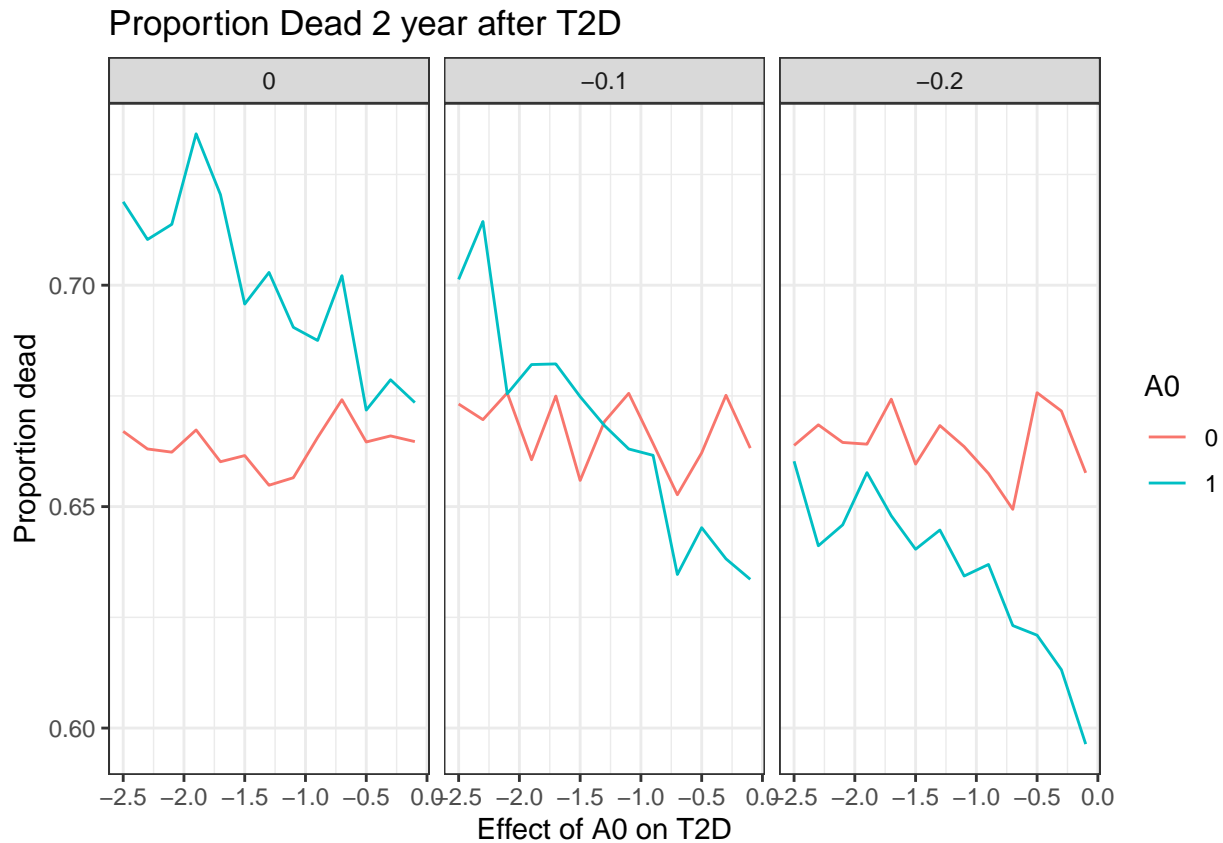
  # Proportion of treatment and placebo patients who have died before 1 year after T2D diagnose
  prop_treat <- nrow(T2D_peeps[Time_T2D < 1 & Delta == 1 & A0 == 1]) / length(unique(T2D_peeps[A0 == 1]$ID))
  prop_plac <- nrow(T2D_peeps[Time_T2D < 1 & Delta == 1 & A0 == 0]) / length(unique(T2D_peeps[A0 == 0]$ID))

  return(c(prop_plac, prop_treat))
}

res5 <- compare_effects2(estimator = estimator2, N = N, eta = c(0.1, 0.3, 0.1, 0.1),
  nu = c(1.1, 1.3, 1.1, 1.1),
  beta_L0_L = 2, beta_A0_L = seq(-2.5, 0, by = 0.2),
  beta_L_D = 1, beta_L0_D = 0)
```

Below the plots show the proportion dead for different effects of the drug on death.

```
plot_compare2(res5, diff_betas = seq(-2.5, 0, by = 0.2))+
  ylab("Proportion dead")+
  xlab("Effect of A0 on T2D")+
  labs(title = "Proportion Dead 2 year after T2D")
```



We now turn to a similar plot. Three different scenarios are considered: 1) no effect of T2D on death (0), 2) moderate effect of L on death (0.5), 3) larger effect of L on death (1). And no effect of drug on death. All other parameters are the same.

```
N <- 1.5*10^4
res6 <- compare_effects3(estimator = estimator2, N = N, eta = c(0.1,0.3,0.1,0.1),
  nu = c(1.1,1.3,1.1,1.1),
  beta_L0_L = 2, beta_A0_L = seq(-2.5, 0, by = 0.2), beta_L0_D = 0)
```

Below the plots show the proportion dead for different effects of the drug on death.

```
plot_compare3(res6, diff_betas = seq(-2.5, 0, by = 0.2))+
  ylab("Proportion dead")+
  xlab("Effect of A0 on T2D")+
  labs(title = "Proportion Dead 2 year after T2D")
```

