

Supplementary Text: Model Equations

B/B: $\text{Surv}(X,d) \sim \text{trt_young} + \text{trt_middle} + \text{trt_old} + \text{middleagegrp} + \text{oldagegrp}$
+ $\text{hh_ward} + \text{large_cluster} + \text{hh_ownhouse} + \text{hh_stableoccupation} + \text{hh_hiexpenditure}$
+ $\text{hh_farfromwater} + \text{cluster}(\text{cl_id})$

T/T: $\text{Surv}(t\text{start},t\text{stop},d) \sim \text{trt_young} + \text{trt_middle} + \text{trt_old} + \text{middleagegrp} + \text{oldagegrp}$
+ $\text{hh_ward} + \text{large_cluster} + \text{hh_ownhouse} + \text{hh_stableoccupation} + \text{hh_hiexpenditure}$
+ $\text{hh_farfromwater} + \text{cluster}(\text{cl_id})$

B/T: $\text{Surv}(t\text{start},t\text{stop},d) \sim \text{trt_byoung} + \text{trt_bmiddle} + \text{trt_bold} + \text{middleagegrp} + \text{oldagegrp}$
+ $\text{hh_ward} + \text{large_cluster} + \text{hh_ownhouse} + \text{hh_stableoccupation} + \text{hh_hiexpenditure}$
+ $\text{hh_farfromwater} + \text{cluster}(\text{cl_id})$

T/B: $\text{Surv}(t\text{start},t\text{stop},d) \sim \text{trt_young} + \text{trt_middle} + \text{trt_old} + \text{bmiddleagegrp} + \text{boldagegrp}$
+ $\text{hh_ward} + \text{large_cluster} + \text{hh_ownhouse} + \text{hh_stableoccupation} + \text{hh_hiexpenditure}$
+ $\text{hh_farfromwater} + \text{cluster}(\text{cl_id})$

The formula B/B is used together with the un-augmented dataset, and all the age group-related predictors in the formula are calculated at baseline. The other three formulae are used together with the augmented dataset for time-dependent covariate analysis [1], in which the variables `trt_young`, `trt_middle`, `trt_old`, `middleagegrp` and `oldagegrp` are calculated using age group during the time interval defined by `tstart` and `tstop`, while the variables `trt_byoung`, `trt_bmiddle`, `trt_bold`, `bmiddleagegrp` and `boldagegrp` are calculated using baseline age group.

Reference

[1] Therneau T, Crowson C. Using time dependent covariates and time dependent coefficients in the Cox model. R Survival Package Vignette. 2014.