Supplemental Files – eMethods

eMethod 1. Cumulative incidence function without covariates adjustment.

eMethod 2. Estimated cumulative incidence function with covariates adjustment.

eMethod 1. Cumulative incidence function without covariates adjustment.

The non-parametric cumulative incidence function for cause j (dementia or dementia-free death) was estimated as:

$$\hat{F}_j^{sub}(t) = \int_0^t \hat{\lambda}_j(\mu)\hat{S}(\mu)d\mu = \int_0^t \hat{S}(\mu)d\hat{\Lambda}_j(\mu) = \int_0^t \frac{\hat{S}(\mu)d\mathrm{N}_j(\mu)}{Y(\mu)}$$

Where $\mathrm{N}_j(t) = \sum_{i=1}^{n} I(X_i \leq t, \delta_i \prod = j)$ is the number of type-j failures at time t

$\mathrm{Y(t)} = \sum_{i=1}^{n} I(X_i \geq t)$ is the number of subjects in the risk set at time t

j = the cause-specific endpoints (dementia or death)

is the observed time (event or censoring) for individual i,

δ_i indicates the event type (0 = censored, 1 = dementia, 2 = death without dementia).

eMethod 2. Estimated cumulative incidence function with covariates adjustment.

The covariate-adjusted cumulative incidence function for cause j (dementia or dementia-free death) was estimated as:

$$\hat{F}_j^{sub}(t;Z) = \int_0^t \hat{\lambda}_j(\mu;Z)\hat{S}(\mu;Z)d\mu = \int_0^t \hat{S}(\mu;Z)d\widehat{\Lambda}_j(\mu;Z)$$

Where $\hat{S}(t;Z)$ is the covariate-adjusted overall survival function:

$$\hat{S}(t;Z) = \exp\{-\int_0^t \lambda(\mu;Z)d\mu\} = \exp\{-\int_0^t \sum_{j=1}^{m} \hat{\lambda}_j(\mu;Z)\,du\} = \exp\{-\sum_{j=1}^{m} \widehat{\Lambda}_j(\mu;Z)\}$$

The cause-specific cumulative hazard function for cause j is given by:

$$\widehat{\Lambda}_j(t;Z) = \exp\{\hat{\beta}_j' Z\} * \widehat{\Lambda}_{j0}(t)$$

Where $\widehat{\Lambda}_{j0}(t)$ is the baseline cumulative hazard function for cause j, $\widehat{\boldsymbol{\beta}}_j$ is the vector of estimated coefficients for covariates **Z**, and m = 2 represents the two competing endpoints (dementia and dementia-free death).