

Online Supplement

Eq. S1. The multilevel linear growth model applied to three longitudinal studies of aging.

$$y_{it} = \beta_{0i} + \beta_{1i} \text{Time}_i + \varepsilon_{it}$$

$$\beta_{0i} = \gamma_{0.0} + \gamma_{0.1} \text{SEX}_i + \gamma_{0.2} \text{AGE}_i + \gamma_{0.3} \text{ED}_i + \gamma_{0.4} \text{SMOKED}_i + \gamma_{0.5} \text{STK}_i + \gamma_{0.6} \text{HTN}_i + \gamma_{0.7} \text{DM}_i + \gamma_{0.8} \text{HTNDM}_i$$

$$\beta_{1i} = \gamma_{1.0} + \gamma_{1.1} \text{SEX}_i + \gamma_{1.2} \text{AGE}_i + \gamma_{1.3} \text{ED}_i + \gamma_{1.4} \text{SMOKED}_i + \gamma_{1.5} \text{STK}_i + \gamma_{1.6} \text{HTN}_i + \gamma_{1.7} \text{DM}_i + \gamma_{1.8} \text{HTNDM}_i$$

where

y_{it} - performance scores on a cognitive test of individual i at time t

β_{0i} - unique intercept of individual i

β_{1i} - unique slope of individual i

Time_i - time in study, unique to each individual

ε_{it} - residual of individual i at time t

$\gamma_{0.0}$ - main effect on the random intercept

$\gamma_{1.0}$ - main effect on the random slope

$\gamma_{0.1}, \gamma_{0.2}, \dots, \gamma_{0.15}$ - fixed effects of corresponding predictors on the random intercept

$\gamma_{1.1}, \gamma_{1.2}, \dots, \gamma_{1.15}$ - fixed effects of corresponding predictors on the random slope

u_{0i} - variance of unique intercept

u_{1i} - variance of unique slope

SEX - sex at baseline, dichotomous

AGE - age at baseline in years

ED - education at baseline in years

SMOKED - ever/never smoking status at baseline, dichotomous

STK - baseline diagnosis of stroke, dichotomous

HTN - baseline diagnosis of hypertension, dichotomous

DM - baseline diagnosis of diabetes mellitus, dichotomous

HTNDM – *HTN***DM* interaction term

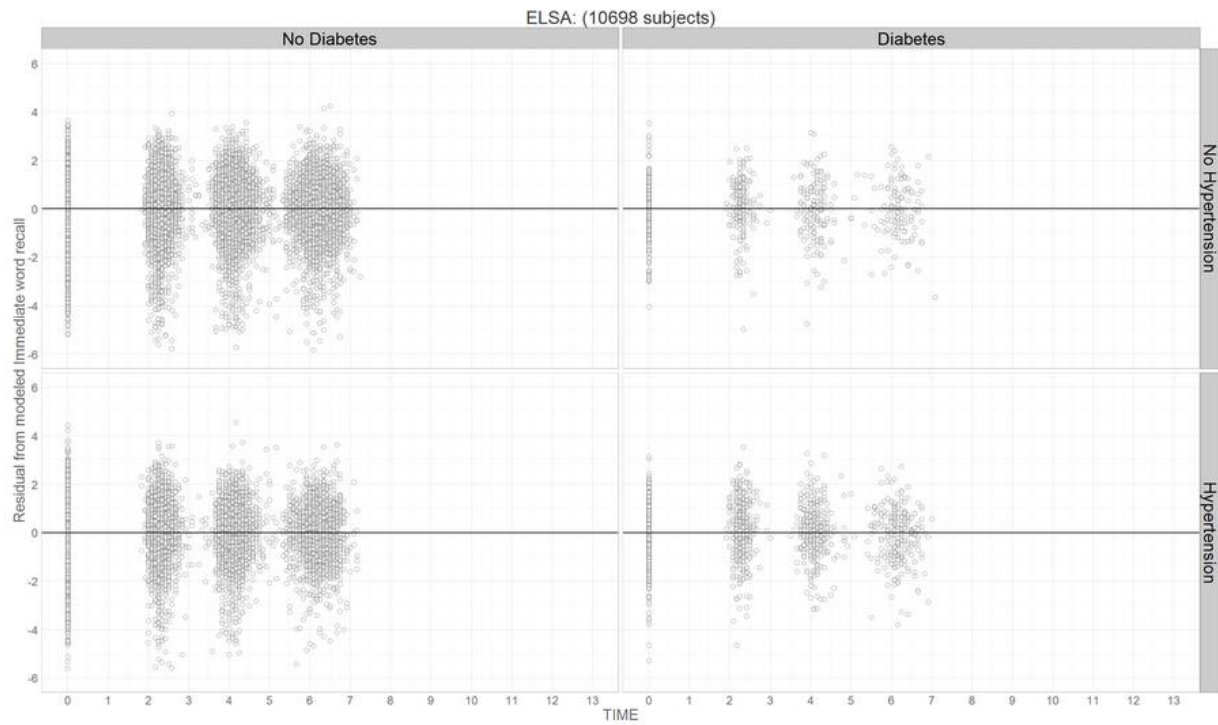


Figure S1. Plot of residual distributions assumed across diagnostic groups for the ELSA study.

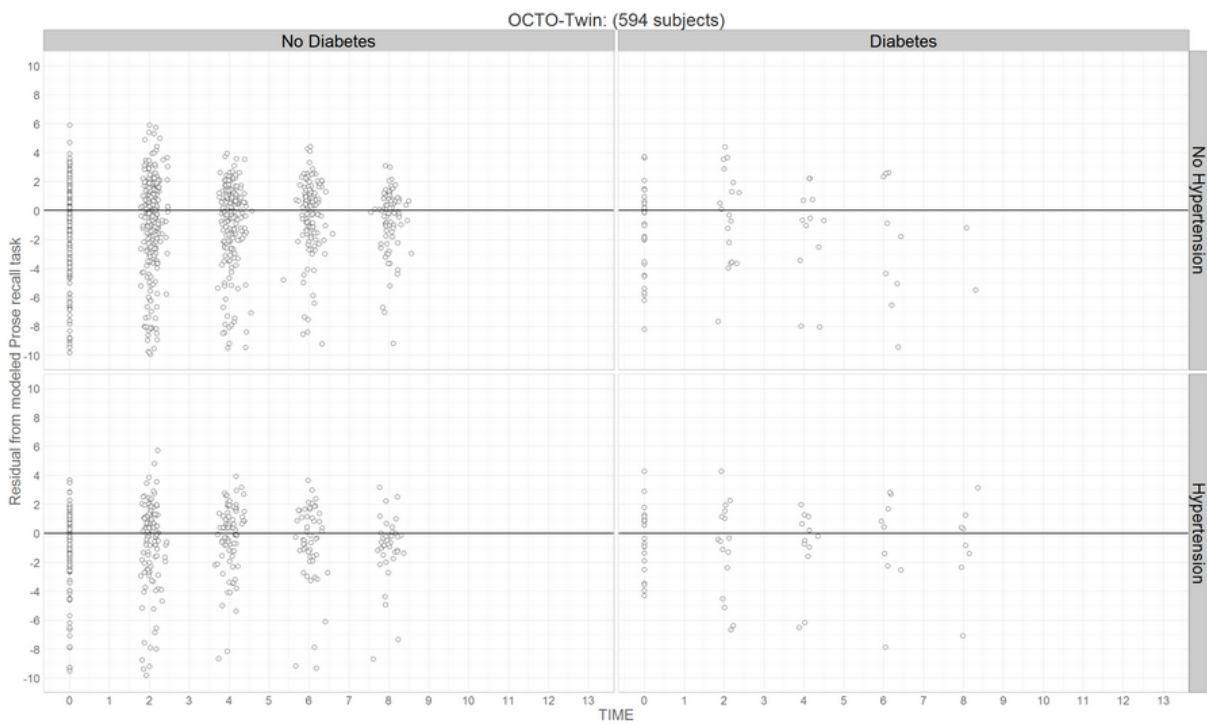


Figure S2. Plot of residual distributions assumed across diagnostic groups for the OCTO-Twin study.

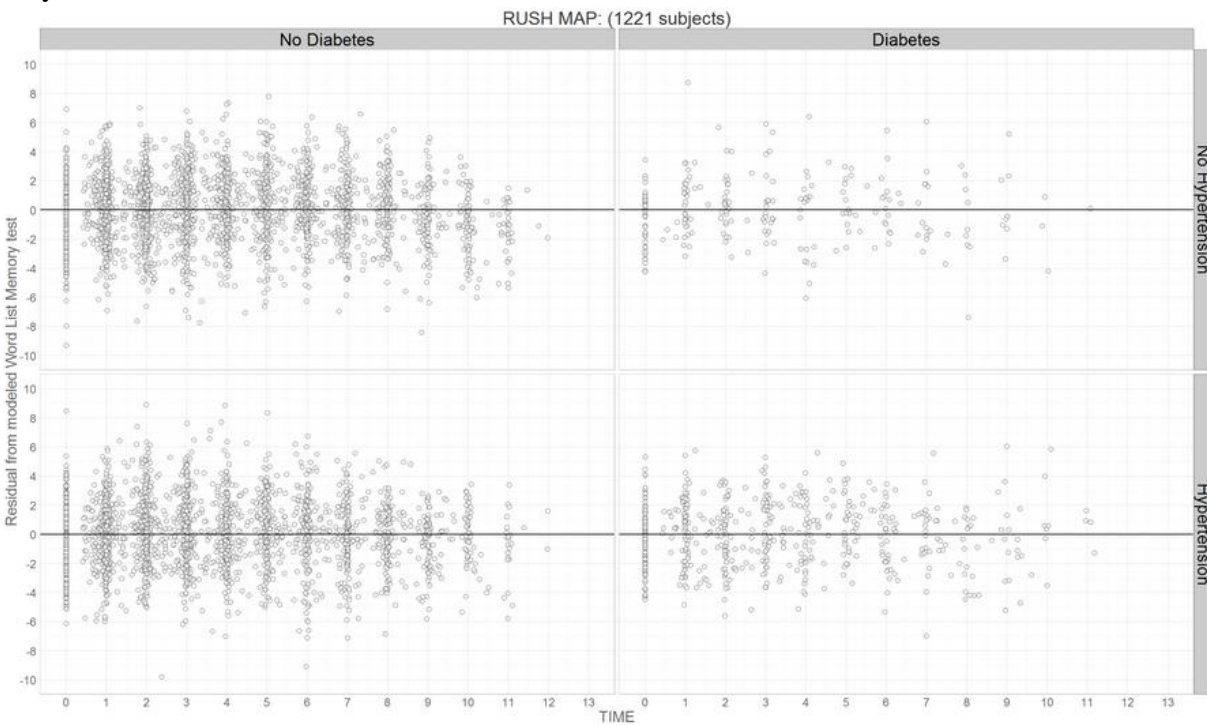


Figure S3. Plot of residual distributions assumed across diagnostic groups for the Rush MAP study (CERAD).

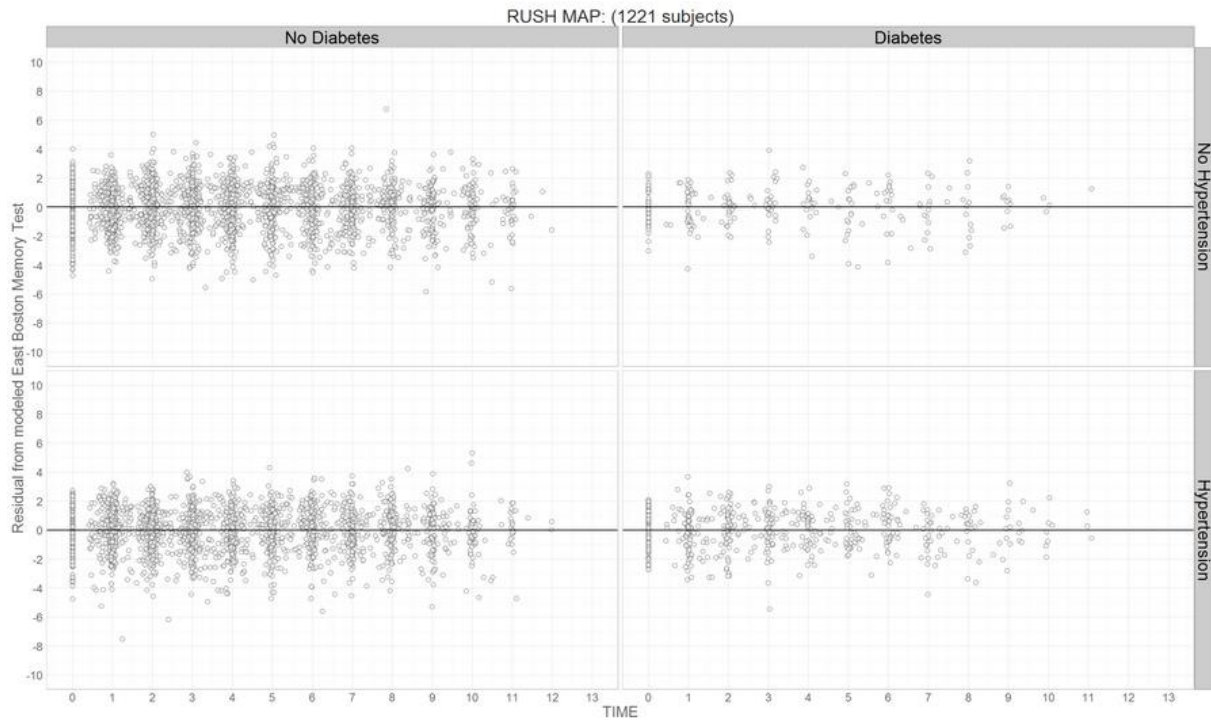


Figure S4. Plot of residual distributions assumed across diagnostic groups for the Rush MAP (EBMT) study.

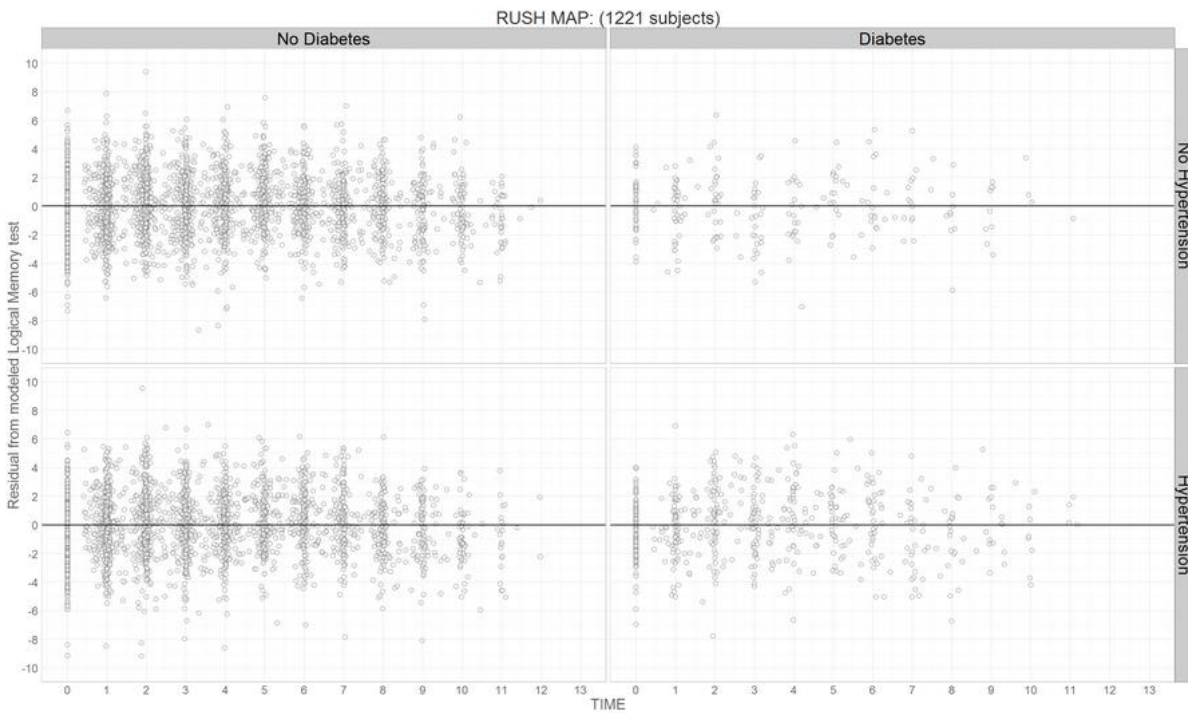


Figure S5. Plot of residual distributions assumed across diagnostic groups for the Rush MAP (Logical Memory test) study.