

$$E_{\text{Sid},t} = \delta + \gamma_{\text{Sid}} \\ + \beta_{\text{AE}} A_{\text{Sid}} + \beta_{\text{TE}[\text{G}_{\text{Sid}}, \text{T}_{\text{Sid}}]} \mathbf{t}$$

$$\delta \sim \text{Normal}(0, 1.5)$$

$$\beta_{\text{AE}}, \beta_{\text{TE}} \sim \text{Normal}(0, 1)$$

$$\gamma_{\text{Sid}} \sim \text{Normal}(0, \tau)$$

$$\tau \sim \text{Normal}^+(0, 1)$$

$$D_{\text{Sid},t}^* \sim \text{Binomial}(14, P_{\text{Sid},t})$$

$$\text{logit}(P_{\text{Sid},t}) = -D_{\text{Sid},t}$$

$$D_{\text{Sid},t} = \alpha + \beta_{\text{TD}[\text{T}_{\text{Sid}}]}t + \beta_{\text{AD}}A_{\text{Sid}} + \beta_{\text{ED}}E_{\text{Sid},t}$$

$$\alpha \sim \text{Normal}(0, 1.5)$$

$$\beta_{\text{AD}}, \beta_{\text{ED}} \sim \text{Normal}(0, 1)$$

$$\beta_{\text{TD}} \sim \text{Normal}(\mu_{\beta_{\text{TD}}}, \sigma_{\beta_{\text{TD}}})$$

$$\mu_{\beta_{\text{TD}}} \sim \text{Normal}(0, 1)$$

$$\sigma_{\beta_{\text{TD}}} \sim \text{Normal}^+(0, 1)$$

$$R_{\text{Sid,Iid,t}} \sim \text{OrderedLogit}(\phi_{\text{Sid,Iid,t}}, \kappa)$$

$$\phi_{\text{Sid,Iid,t}} = E_{\text{Sid,t}} + I_{\text{Iid}}$$

$$\kappa \sim \text{Normal}(0, 1)$$

$$I_1 = - \sum_{i=2}^{N_I} I_i \quad (\text{sum-to-zero})$$

$$I_2, I_3, \dots, I_{N_I} \sim \text{Normal}(0, \sigma_I)$$

$$\sigma_I \sim \text{Exponential}(1)$$