$$\log E(Y_{ij}) = \log(2) - 0.1864 + 0.0287\, bline_i - 0.2388\, trt_i + 0.0138\, age_i + \gamma_{0i}$$

$$\log\left(\frac{E(Y_{ij})}{2}\right) = (-0.1864 + \gamma_{0i}) + 0.0287\, bline_i - \cdots$$

← 平均每週癲癇次數

$$\gamma_{0i} \sim \text{Normal}(0, \sigma_0^2)$$

$$\log E(Y_{ij}) = \log(2) - 0.200 + 0.02848\,\text{bline}_i - 0.226\,\text{trt}_i$$

$$+ 0.0983\,\text{age}_i - 0.06429\,\text{visit}_{ij}$$

$$+ \gamma_{0i} + \gamma_{1i}\,\text{visit}_{ij}$$

$$\log \frac{E(Y_{ij})}{2} = (-0.200 + \gamma_{0i}) + (-0.06429 + \gamma_{1i}) \cdot \text{visit}_{ij}$$

$$+ \ldots$$

$$\gamma_{0i} \sim \text{Normal}(0, \sigma_0^2)$$

$$\gamma_{1i} \sim \text{Normal}(0, \sigma_1^2)$$

$H_0: \sigma_1^2 = 0$

$H_1: \sigma_1^2 > 0$

random slope 的 variance $= \sigma_1^2$

p-value $= 0.0111 < 0.05$

reject H_0,

random slope 需留下

$$\log \frac{P(Y_{ij}=1)}{1-P(Y_{ij}=1)} = x_{ij}'\beta + \eta Y_{i,j-1}$$

$$P(Y_{ij}=1) = \frac{e^{x_{ij}'\beta + \eta Y_{i,j-1}}}{1+e^{x_{ij}'\beta + \eta Y_{i,j-1}}}$$

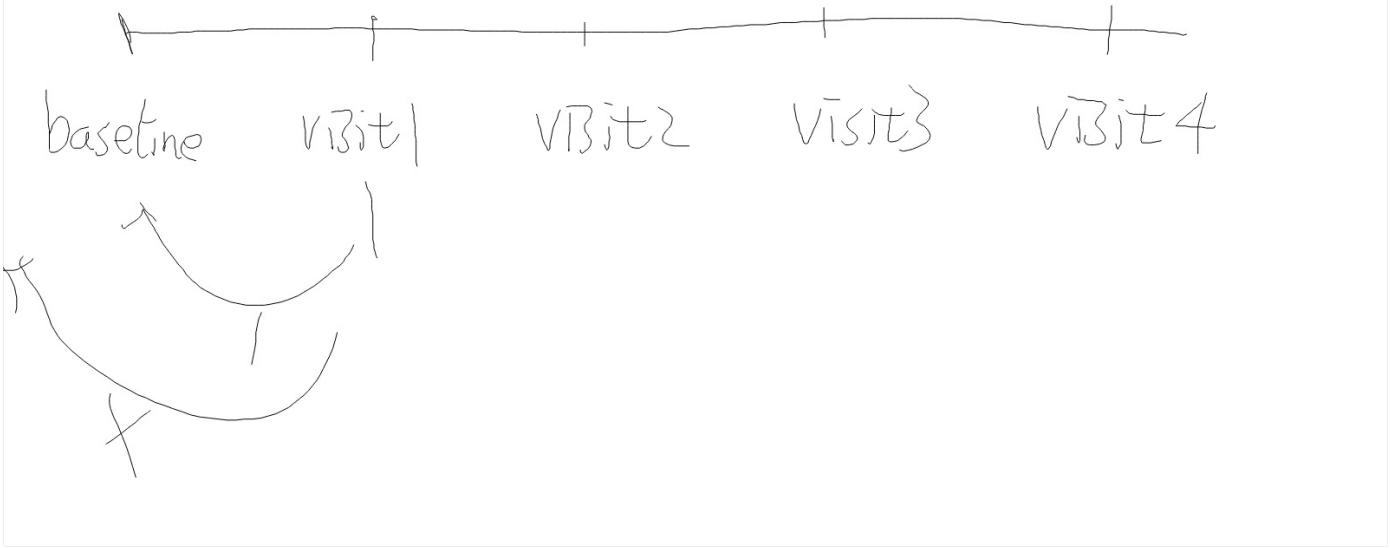
$$P(Y_{ij}=0) = \frac{1}{1+e^{x_{ij}'\beta + \eta Y_{i,j-1}}}$$

$$P(Y_{ij}=0 \mid Y_{ij-1}=0) = \frac{1}{1+e^{x_{ij}'\beta}}$$

$$P(Y_{ij}=1 \mid Y_{ij-1}=0) = \frac{e^{x_{ij}'\beta}}{1+e^{x_{ij}'\beta}}$$

$$P(Y_{ij}=0 \mid Y_{ij-1}=1) = \frac{1}{1+e^{x_{ij}'\beta+\eta}}$$

$$P(Y_{ij}=1 \mid Y_{ij-1}=1) = \frac{e^{x_{ij}'\beta+\eta}}{1+e^{x_{ij}'\beta+\eta}}$$


baseline
visit1
visit2
visit3
visit4

$$Y_t = 8.23 + 0.502t + \varepsilon_t$$

$$\varepsilon_t \sim iid\ N(0, 6.32)$$

$$\hat{Var}(\varepsilon_t) = 6.32 = MSE \quad (\text{error})$$

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nlag = 1

$$Y_t = 8.13 + 0.499t + V_t$$

$$V_t = 0.7459\, V_{t-1} + \varepsilon_t, \quad \varepsilon_t \overset{iid}{\sim} N(0, 2.74)$$

$$\hat{Var}(\varepsilon_t) = 2.74$$