

# Notes on HW 7

5/5/22

$$\log(\hat{E}(Y_{ij} | b_i)) = -2.374 + \underline{0.106} x_i - 0.05125 t_{ij} + \underline{0.02406} x_i t_{ij} + \hat{b}_{0i} + \hat{b}_{2i} t_{ij} \quad (1)$$

$$ID: 419238 \rightarrow \hat{b}_{s2} = ( ) \quad \text{rundef}( )$$

$$\log(\hat{E}(Y_{(s2)j} | b_{s2})) = -2.767$$

$$+ \underset{\substack{\uparrow \\ x_{s2}=0}}{0.106} x_i - 0.0415 t_{ij} + 0.02406 x_i t_{ij} \quad \underset{\substack{\uparrow \\ x_{s2}=0}}{0.02406} x_i t_{ij}$$

$$= -2.767 - \underline{0.0415} t_{ij}$$

## Correlated Data

$$\begin{pmatrix} y_{i1} \\ y_{i2} \\ y_{i3} \end{pmatrix}$$

$i = 1, 2, \dots, n$

← individuals  
independent

$$E(\underline{y})$$

GLMM:  $\underline{y}_i | \underline{b}_i$  are independent

$$\text{Cov}(y_{ij}, y_{ik}) = E[\text{Cov}(y_{ij}, y_{ik} | \underline{b}_i)]$$

---? → will not  
be zero!

$$E(y) = E[E(y|z)]$$

— random effects  
induce correlation  
marginally  
between  $y_{ij}$  &  $y_{ik}$

Why do interpretations differ between GLMM  
& GEE models?

$$E[E(y_{ij} | \underline{b}_i)] = E(y_{ij})$$

$$E(g(E(y_{ij} | \underline{b}_i))) \neq g(E(E(y_{ij} | \underline{b}_i)))$$