

$$\text{CigGE50}_{ij} \sim \text{Binomial}(n_{ij}, \pi_{ij})$$

$$\begin{aligned} \text{logit}(\pi_{ij}) = & \beta_{0j} \text{cons} + 1.921(1.012)\text{Time\_1}_{ij} + -0.504(0.626)\text{zine}_j + 0.346(0. \\ & -7.850(0.758)\text{non\_smoker}_j + 0.413(0.205)\text{grade\_10}_j + 0.877(0.3 \\ & 0.230(0.204)\text{zine.Time\_1}_{ij} + 1.441(0.222)\text{non\_smoker.Time\_1}_{ij} \\ & -0.241(0.111)\text{zine.non\_smoker.Time\_1}_{ij} + -0.350(0.112)\text{non\_sr} \\ & -0.351(0.167)\text{Time\_2}_{ij} \end{aligned}$$

$$\beta_{0j} = -2.699(1.471) + u_{0j}$$

$$[u_{0j}] \sim N(0, \Omega_u) : \Omega_u = [2.032(0.316)]$$

$$\text{var}(\text{CigGE50}_{ij} | \pi_{ij}) = \pi_{ij}(1 - \pi_{ij})/n_{ij}$$

Note: only time 2,3 and 4 are included in the model. Time\_1=Time is the linear term, Time\_2=Time\*Time is 1

$$46(0.179)\text{male}_j + 7(0.301)\text{grade}_{11j} + \epsilon_{1ij} + \alpha_{\text{smoker.grade}_{11}.\text{Time}_{1ij}} +$$

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|--------------------------------|
| <b>Level 1 (Time)</b>          |
| Constant                       |
| Time                           |
| Time*Time                      |
| <b>Level 2 (individual)</b>    |
| Group (ref: control)           |
| Sex (ref: female)              |
| Non-smoker (ref: smoker)       |
| Grade10 (ref: grade9)          |
| Grade11 (ref: grade9)          |
| <b>Intra-class interaction</b> |
| Group*Time                     |
| Non-smoker*Time                |
| Group*Non-smoker*Time          |
| Non-smoker*Grade11*Time        |

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the quadratic term

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**Cigarette Use**

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-2.646

1.883

-0.344\*

-0.504

0.346

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-7.850\*

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0.413\*

0.877\*

0.23

1.441\*

-0.241\*

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-0.350\*

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