**Generalized Linear Mixed Models**

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| **Notes** | | |
| Output Created | | 28-JUN-2022 17:34:01 |
| Comments | |  |
| Input | Data | S:\Quant\data cleaning\V2\KN\V3\Analysis\Analysis 27.06.2022\NERS\_NS.sav |
| Active Dataset | DataSet1 |
| Filter | Cohort\_Group = 1 | Cohort\_Group = 2 | Cohort\_Group = 3 (FILTER) |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 28917 |
| Syntax | | GENLINMIXED  /DATA\_STRUCTURE SUBJECTS=Local\_Authority  /FIELDS TARGET=Date\_of\_first\_consultation\_recorded TRIALS=NONE OFFSET=NONE  /TARGET\_OPTIONS DISTRIBUTION=BINOMIAL LINK=LOGIT  /FIXED EFFECTS=IMD\_Quintile Age\_at\_ref2 Gender2 Pathways\_5 Cohort\_two\_groups ref\_recode2 USE\_INTERCEPT=TRUE  /RANDOM EFFECTS=IMD\_Quintile Age\_at\_ref2 Gender2 Pathways\_5 Cohort\_two\_groups ref\_recode2 USE\_INTERCEPT=TRUE  SUBJECTS=Local\_Authority COVARIANCE\_TYPE=VARIANCE\_COMPONENTS SOLUTION=FALSE  /BUILD\_OPTIONS TARGET\_CATEGORY\_ORDER=DESCENDING INPUTS\_CATEGORY\_ORDER=DESCENDING  MAX\_ITERATIONS=100 CONFIDENCE\_LEVEL=95 DF\_METHOD=RESIDUAL COVB=MODEL PCONVERGE=0.000001(ABSOLUTE)  SCORING=0 SINGULAR=0.000000000001  /EMMEANS\_OPTIONS SCALE=ORIGINAL PADJUST=LSD. |
| Resources | Processor Time | 00:00:08.80 |
| Elapsed Time | 00:00:08.56 |

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| **Case Processing Summary** | | |
|  | N | Percent |
| Included | 27859 | 96.3% |
| Excluded | 1058 | 3.7% |
| Total | 28917 | 100.0% |

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| **Model Summary** | | |
| Target | | Date\_of\_first\_consultation\_recorded |
| Probability Distribution | | Binomial |
| Link Function | | Logit |
| Information Criterion | Akaike Corrected | 120303.680 |
| Bayesian | 120361.317 |
| Information criteria are based on the -2 log likelihood (120289.676) and are used to compare models. Models with smaller information criterion values fit better. | | |

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| **Data Structurea** | | |
|  | Subjects | Target |
| Local\_Authority | Date\_of\_first\_consultation\_recorded |
| Data for First Subject | 1.000 | yes |
| 1.000 | yes |
| 1.000 | yes |
| 1.000 | yes |
| 1.000 | yes |
| 1.000 | yes |
| 1.000 | yes |
| 1.000 | yes |
| 1.000 | yes |
| 1.000 | yes |
| Total Number of Levels | 22 |  |
| Only the first 10 records are displayed.a | | |
| a. Target: Date\_of\_first\_consultation\_recorded | | |

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| **Classification**  **Overall Percent Correct = 62.2%a** | | | |
| Observed | | Predicted | |
| yes | no |
| yes | Count | 8672 | 5209 |
| % within Observed | 62.5% | 37.5% |
| no | Count | 5328 | 8650 |
| % within Observed | 38.1% | 61.9% |
| a. Target: Date\_of\_first\_consultation\_recorded | | | |

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| --- | --- | --- | --- | --- |
| **Fixed Effectsa** | | | | |
| Source | F | df1 | df2 | Sig. |
| Corrected Model | 23.865 | 14 | 27844 | .000 |
| IMD\_Quintile | 10.405 | 4 | 27844 | <.001 |
| Age\_at\_ref2 | 212.771 | 1 | 27844 | .000 |
| Gender2 | 6.127 | 1 | 27844 | .013 |
| Pathways\_5 | 6.023 | 4 | 27844 | <.001 |
| Cohort\_two\_groups | 7.639 | 1 | 27844 | .006 |
| ref\_recode2 | .471 | 3 | 27844 | .703 |
| Probability distribution: Binomial  Link function: Logita | | | | |
| a. Target: Date\_of\_first\_consultation\_recorded | | | | |

Diagram

Description automatically generated

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Fixed Coefficientsa** | | | | | | | | | |
| Model Term | Coefficient | Std. Error | t | Sig. | 95% Confidence Interval | | Exp(Coefficient) | 95% Confidence Interval for Exp(Coefficient) | |
| Lower | Upper | Lower | Upper |
| Intercept | -1.324 | .1532 | -8.643 | .000 | -1.624 | -1.024 | .266 | .197 | .359 |
| IMD\_Quintile=5 | .287 | .0484 | 5.927 | <.001 | .192 | .382 | 1.332 | 1.212 | 1.465 |
| IMD\_Quintile=4 | .199 | .0459 | 4.327 | <.001 | .109 | .289 | 1.220 | 1.115 | 1.335 |
| IMD\_Quintile=3 | .196 | .0454 | 4.319 | <.001 | .107 | .285 | 1.217 | 1.113 | 1.330 |
| IMD\_Quintile=2 | .101 | .0446 | 2.257 | .024 | .013 | .188 | 1.106 | 1.013 | 1.207 |
| IMD\_Quintile=1 | 0b | . | . | . | . | . | . | . | . |
| Age\_at\_ref2 | .019 | .0013 | 14.587 | .000 | .017 | .022 | 1.020 | 1.017 | 1.022 |
| Gender2=2 | .103 | .0416 | 2.475 | .013 | .021 | .185 | 1.108 | 1.022 | 1.203 |
| Gender2=1 | 0b | . | . | . | . | . | . | . | . |
| Pathways\_5=6 | -.160 | .0859 | -1.865 | .062 | -.329 | .008 | .852 | .720 | 1.008 |
| Pathways\_5=5 | -.141 | .0953 | -1.474 | .140 | -.327 | .046 | .869 | .721 | 1.047 |
| Pathways\_5=3 | .087 | .1090 | .801 | .423 | -.126 | .301 | 1.091 | .881 | 1.351 |
| Pathways\_5=2 | .248 | .0830 | 2.985 | .003 | .085 | .411 | 1.281 | 1.089 | 1.508 |
| Pathways\_5=1 | 0b | . | . | . | . | . | . | . | . |
| Cohort\_two\_groups=2 | -.412 | .1492 | -2.764 | .006 | -.705 | -.120 | .662 | .494 | .887 |
| Cohort\_two\_groups=1 | 0b | . | . | . | . | . | . | . | . |
| ref\_recode2=4 | -.009 | .0749 | -.116 | .908 | -.156 | .138 | .991 | .856 | 1.148 |
| ref\_recode2=3 | .070 | .0769 | .905 | .366 | -.081 | .220 | 1.072 | .922 | 1.246 |
| ref\_recode2=2 | .049 | .0706 | .694 | .488 | -.089 | .187 | 1.050 | .914 | 1.206 |
| ref\_recode2=1 | 0b | . | . | . | . | . | . | . | . |
| Probability distribution: Binomial  Link function: Logita | | | | | | | | | |
| a. Target: Date\_of\_first\_consultation\_recorded | | | | | | | | | |
| b. This coefficient is set to zero because it is redundant. | | | | | | | | | |

Chart, diagram

Description automatically generated

**Random Effect Covariances**

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| **Random Effect Block 1** |
| Random Effect Block | | Intercept | IMD\_Quintile=5 | IMD\_Quintile=4 | IMD\_Quintile=3 | IMD\_Quintile=2 | IMD\_Quintile=1 | Age\_at\_ref2 | Gender2=2 | Gender2=1 | Pathways\_5=6 | Pathways\_5=5 | Pathways\_5=3 | Pathways\_5=2 | Pathways\_5=1 | Cohort\_two\_groups=2 | Cohort\_two\_groups=1 | ref\_recode2=4 | ref\_recode2=3 | ref\_recode2=2 | ref\_recode2=1 |
| Intercept | | .126 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| IMD\_Quintile=5 | | .000 | .003 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| IMD\_Quintile=4 | | .000 | .000 | .003 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| IMD\_Quintile=3 | | .000 | .000 | .000 | .003 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| IMD\_Quintile=2 | | .000 | .000 | .000 | .000 | .003 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| IMD\_Quintile=1 | | .000 | .000 | .000 | .000 | .000 | .003 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| Age\_at\_ref2 | | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| Gender2=2 | | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .011 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| Gender2=1 | | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .011 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| Pathways\_5=6 | | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .057 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| Pathways\_5=5 | | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .057 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| Pathways\_5=3 | | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .057 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| Pathways\_5=2 | | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .057 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| Pathways\_5=1 | | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .057 | .000 | .000 | .000 | .000 | .000 | .000 |
| Cohort\_two\_groups=2 | | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .197 | .000 | .000 | .000 | .000 | .000 |
| Cohort\_two\_groups=1 | | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .197 | .000 | .000 | .000 | .000 |
| ref\_recode2=4 | | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .042 | .000 | .000 | .000 |
| ref\_recode2=3 | | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .042 | .000 | .000 |
| ref\_recode2=2 | | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .042 | .000 |
| ref\_recode2=1 | | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .042 |
| Covariance Structure: Variance components  Subject Specification: Local\_Authority |

**Covariance Parameters**

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| --- | --- | --- |
| **Covariance Parameters Summary** | | |
| Covariance Parameters | Residual Effect | 0 |
| Random Effects | 7 |
| Design Matrix Columns | Fixed Effects | 20 |
| Random Effects | 20a |
| Common Subjects | | 22 |
| Common subjects are based on the subject specifications for the residual and random effects and are used to chunk the data for better performance. | | |
| a. This is the number of columns per common subject. | | |

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| **Residual Effect** | | | | | | |
| Residual Effect | Estimate | Std. Error | Z | Sig. | 95% Confidence Interval | |
| Lower | Upper |
| Variance | 1.000 | . | . | . | . | . |
| Covariance Structure: Scaled Identity  Subject Specification: (None) | | | | | | |

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| --- | --- | --- | --- | --- | --- | --- |
| **Random Effect** | | | | | | |
| Random Effect Covariance | Estimate | Std. Error | Z | Sig. | 95% Confidence Interval | |
| Lower | Upper |
| Var(Intercept) | .126 | .098 | 1.278 | .201 | .027 | .582 |
| Var(IMD\_Quintile) | .003 | .003 | 1.007 | .314 | .000 | .022 |
| Var(Age\_at\_ref2) | 2.304E-5 | 1.122E-5 | 2.054 | .040 | 8.871E-6 | 5.983E-5 |
| Var(Gender2) | .011 | .006 | 1.923 | .054 | .004 | .031 |
| Var(Pathways\_5) | .057 | .015 | 3.827 | <.001 | .034 | .095 |
| Var(Cohort\_two\_groups) | .197 | .078 | 2.529 | .011 | .091 | .427 |
| Var(ref\_recode2) | .042 | .011 | 3.847 | <.001 | .025 | .069 |
| Covariance Structure: Variance components  Subject Specification: Local\_Authority | | | | | | |

**Estimated Marginal Means for Top Significant Fixed Effects**

Chart

Description automatically generated

Chart

Description automatically generated

Chart, line chart

Description automatically generated

Chart, box and whisker chart

Description automatically generated