**APPENDIX: Model Results**

**Negative binomial without demographic covariates (NB)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | Estimate | SE† | 95% Confidence Interval | | P value‡ |  |
| (Intercept) | -9.600 | 0.023 | -9.645 | -9.555 | < 2.00e-16 | \*\*\* |
| Year 2005 (ref: 2004) | -0.015 | 0.026 | -0.066 | 0.036 | 5.59e-1 |  |
| Year 2006 (ref: 2004) | 0.001 | 0.026 | -0.050 | 0.052 | 9.62e-1 |  |
| Year 2007 (ref: 2004) | 0.010 | 0.025 | -0.039 | 0.059 | 6.88e-1 |  |
| Year 2008 (ref: 2004) | -0.002 | 0.026 | -0.053 | 0.049 | 9.33e-1 |  |
| Year 2009 (ref: 2004) | 0.040 | 0.025 | -0.009 | 0.089 | 1.17e-1 |  |
| Year 2010 (ref: 2004) | 0.064 | 0.025 | 0.015 | 0.113 | 1.10e-2 | \* |
| Year 2011 (ref: 2004) | 0.107 | 0.025 | 0.058 | 0.156 | 1.75e-5 | \*\*\* |
| State CO (ref: GA) | 0.868 | 0.029 | 0.811 | 0.925 | < 2.00e-16 | \*\*\* |
| State CT (ref: GA) | 0.795 | 0.028 | 0.740 | 0.850 | < 2.00e-16 | \*\*\* |
| State MD (ref: GA) | 0.115 | 0.027 | 0.062 | 0.168 | 1.44e-5 | \*\*\* |
| State MN (ref: GA) | 0.981 | 0.021 | 0.940 | 1.022 | < 2.00e-16 | \*\*\* |
| State NM (ref: GA) | 1.005 | 0.027 | 0.952 | 1.058 | < 2.00e-16 | \*\*\* |
| State NY (ref: GA) | 0.664 | 0.024 | 0.617 | 0.711 | < 2.00e-16 | \*\*\* |
| State OR (ref: GA) | 1.023 | 0.024 | 0.976 | 1.070 | < 2.00e-16 | \*\*\* |
| State TN (ref: GA) | 0.064 | 0.024 | 0.017 | 0.111 | 9.00e-3 | \*\* |

† Standard Error, ‡ Significant codes: ‘\*\*\*’ < 0.001, ‘\*\*’ < 0.01, ‘\*’ < 0.05, ‘.’ < 0.1

**Negative binomial with demographic covariates (NB.Plus)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | Estimate | SE† | 95% Confidence Interval | | P value‡ |  |
| (Intercept) | -9.831 | 0.026 | -9.882 | -9.780 | < 2.00e-16 | \*\*\* |
| Year 2005 (ref: 2004) | -0.015 | 0.024 | -0.062 | 0.032 | 5.37e-1 |  |
| Year 2006 (ref: 2004) | 0.004 | 0.024 | -0.043 | 0.051 | 8.62e-1 |  |
| Year 2007 (ref: 2004) | 0.009 | 0.024 | -0.038 | 0.056 | 7.16e-1 |  |
| Year 2008 (ref: 2004) | -0.011 | 0.024 | -0.058 | 0.036 | 6.41 e-1 |  |
| Year 2009 (ref: 2004) | 0.031 | 0.024 | -0.016 | 0.078 | 1.86e-1 |  |
| Year 2010 (ref: 2004) | 0.058 | 0.023 | 0.013 | 0.103 | 1.30e-2 | \* |
| Year 2011 (ref: 2004) | 0.106 | 0.023 | 0.061 | 0.151 | 5.42e-6 | \*\*\* |
| State CO (ref: GA) | 0.860 | 0.027 | 0.807 | 0.913 | < 2.00e-16 | \*\*\* |
| State CT (ref: GA) | 0.821 | 0.026 | 0.770 | 0.872 | < 2.00e-16 | \*\*\* |
| State MD (ref: GA) | 0.123 | 0.025 | 0.074 | 0.172 | 7.97e-7 | \*\*\* |
| State MN (ref: GA) | 0.974 | 0.020 | 0.935 | 1.013 | < 2.00e-16 | \*\*\* |
| State NM (ref: GA) | 0.983 | 0.026 | 0.932 | 1.034 | < 2.00e-16 | \*\*\* |
| State NY (ref: GA) | 0.664 | 0.023 | 0.619 | 0.709 | < 2.00e-16 | \*\*\* |
| State OR (ref: GA) | 1.040 | 0.022 | 0.997 | 1.083 | < 2.00e-16 | \*\*\* |
| State TN (ref: GA) | 0.064 | 0.024 | 0.017 | 0.111 | 7.00e-3 | \*\* |
| Age\_Group\* 1 (ref: 4) | 0.753 | 0.019 | 0.716 | 0.790 | < 2.00e-16 | \*\*\* |
| Age\_Group\* 2 (ref: 4) | -0.348 | 0.020 | -0.387 | -0.309 | < 2.00e-16 | \*\*\* |
| Age\_Group\* 3 (ref: 4) | 0.003 | 0.021 | -0.038 | 0.044 | 8.93e-1 |  |
| Age\_Group\* 5 (ref: 4) | 0.027 | 0.017 | -0.006 | 0.060 | 1.11e-1 |  |
| Age\_Group\* 6 (ref: 4) | -0.114 | 0.021 | -0.155 | -0.073 | 3.08e-8 | \*\*\* |
| Season High (ref: Low) | 0.556 | 0.012 | 0.532 | 0.580 | < 2.00e-16 | \*\*\* |
| Sex Female (ref: Male) | -0.249 | 0.012 | -0.273 | -0.225 | < 2.00e-16 | \*\*\* |

† Standard Error, ‡ Significant codes: ‘\*\*\*’ < 0.001, ‘\*\*’ < 0.01, ‘\*’ < 0.05, ‘.’ < 0.1

\* Age\_Group: less than 5 years (1), 5-17 years (2), 18-24 years (3), 25-44 years (4),

45-64 years (5), and 65+ (6) years of age

**Zero-inflated negative binomial with covariates in the count component only (ZINB)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | Estimate | SE† | 95% Confidence Interval | | P value‡ |  |
| *Count component* |  |  |  |  |  |  |
| (Intercept) | -9.831 | 0.026 | -9.882 | -9.780 | < 2.00e-16 | \*\*\* |
| Year 2005 (ref: 2004) | -0.015 | 0.024 | -0.062 | 0.032 | 5.39e-1 |  |
| Year 2006 (ref: 2004) | 0.004 | 0.024 | -0.043 | 0.051 | 8.63e-1 |  |
| Year 2007 (ref: 2004) | 0.009 | 0.024 | -0.038 | 0.056 | 7.18e-1 |  |
| Year 2008 (ref: 2004) | -0.011 | 0.024 | -0.058 | 0.036 | 6.44e-1 |  |
| Year 2009 (ref: 2004) | 0.031 | 0.024 | -0.016 | 0.078 | 1.90e-1 |  |
| Year 2010 (ref: 2004) | 0.058 | 0.024 | 0.011 | 0.105 | 1.40e-2 | \* |
| Year 2011 (ref: 2004) | 0.106 | 0.023 | 0.061 | 0.151 | 6.20e-6 | \*\*\* |
| State CO (ref: GA) | 0.860 | 0.027 | 0.807 | 0.913 | < 2.00e-16 | \*\*\* |
| State CT (ref: GA) | 0.821 | 0.026 | 0.770 | 0.872 | < 2.00e-16 | \*\*\* |
| State MD (ref: GA) | 0.123 | 0.025 | 0.074 | 0.172 | 8.51e-7 | \*\*\* |
| State MN (ref: GA) | 0.974 | 0.021 | 0.933 | 1.015 | < 2.00e-16 | \*\*\* |
| State NM (ref: GA) | 0.983 | 0.026 | 0.932 | 1.034 | < 2.00e-16 | \*\*\* |
| State NY (ref: GA) | 0.664 | 0.023 | 0.619 | 0.709 | < 2.00e-16 | \*\*\* |
| State OR (ref: GA) | 1.040 | 0.022 | 0.997 | 1.083 | < 2.00e-16 | \*\*\* |
| State TN (ref: GA) | 0.064 | 0.024 | 0.017 | 0.111 | 7.00e-3 | \*\* |
| Age\_Group\* 1 (ref: 4) | 0.753 | 0.020 | 0.714 | 0.792 | < 2.00e-16 | \*\*\* |
| Age\_Group\* 2 (ref: 4) | -0.348 | 0.020 | -0.387 | -0.309 | < 2.00e-16 | \*\*\* |
| Age\_Group\* 3 (ref: 4) | 0.003 | 0.022 | -0.040 | 0.046 | 8.92e-1 |  |
| Age\_Group\* 5 (ref: 4) | 0.027 | 0.017 | -0.006 | 0.060 | 1.11e-1 |  |
| Age\_Group\* 6 (ref: 4) | -0.114 | 0.021 | -0.155 | -0.073 | 3.12e-8 | \*\*\* |
| Season High (ref: Low) | 0.556 | 0.012 | 0.532 | 0.580 | < 2.00e-16 | \*\*\* |
| Sex Female (ref: Male) | -0.249 | 0.012 | -0.273 | -0.225 | < 2.00e-16 | \*\*\* |
| Log(theta) | 1.700 | 0.050 | 1.602 | 1.798 | < 2.00e-16 | \*\*\* |
| *Zero component* |  |  |  |  |  |  |
| (Intercept) | -19.601 | 5.335 | -30.058 | -9.144 | 2.00e-4 | \*\*\* |

† Standard Error, ‡ Significant codes: ‘\*\*\*’ < 0.001, ‘\*\*’ < 0.01, ‘\*’ < 0.05, ‘.’ < 0.1

\* Age\_Group: less than 5 years (1), 5-17 years (2), 18-24 years (3), 25-44 years (4),

45-64 years (5), and 65+ (6) years of age

**Hurdle negative binomial with covariates in the count component only (Hurdle NB)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | Estimate | SE† | 95% Confidence Interval | | P value‡ |  |
| *Count component* |  |  |  |  |  |  |
| (Intercept) | -9.830 | 0.040 | -9.908 | -9.752 | < 2.00e-16 | \*\*\* |
| Year 2005 (ref: 2004) | 0.007 | 0.034 | -0.060 | 0.074 | 8.39e-1 |  |
| Year 2006 (ref: 2004) | 0.050 | 0.034 | -0.017 | 0.117 | 1.39e-1 |  |
| Year 2007 (ref: 2004) | 0.023 | 0.034 | -0.044 | 0.090 | 4.93e-1 |  |
| Year 2008 (ref: 2004) | -0.019 | 0.034 | -0.086 | 0.048 | 5.76e-1 |  |
| Year 2009 (ref: 2004) | 0.002 | 0.034 | -0.065 | 0.069 | 9.44e-1 |  |
| Year 2010 (ref: 2004) | 0.055 | 0.033 | -0.010 | 0.120 | 9.68e-2 | . |
| Year 2011 (ref: 2004) | 0.135 | 0.033 | 0.070 | 0.200 | 3.92e-5 | \*\*\* |
| State CO (ref: GA) | 0.827 | 0.037 | 0.754 | 0.900 | < 2.00e-16 | \*\*\* |
| State CT (ref: GA) | 0.815 | 0.036 | 0.744 | 0.886 | < 2.00e-16 | \*\*\* |
| State MD (ref: GA) | 0.133 | 0.038 | 0.059 | 0.207 | 4.78e-4 | \*\*\* |
| State MN (ref: GA) | 0.888 | 0.034 | 0.821 | 0.955 | < 2.00e-16 | \*\*\* |
| State NM (ref: GA) | 1.024 | 0.042 | 0.942 | 1.106 | < 2.00e-16 | \*\*\* |
| State NY (ref: GA) | 0.538 | 0.038 | 0.464 | 0.612 | < 2.00e-16 | \*\*\* |
| State OR (ref: GA) | 1.003 | 0.034 | 0.936 | 1.070 | < 2.00e-16 | \*\*\* |
| State TN (ref: GA) | -0.002 | 0.044 | -0.088 | 0.084 | 9.72e-1 |  |
| Age\_Group\* 1 (ref: 4) | 0.600 | 0.029 | 0.543 | 0.657 | < 2.00e-16 | \*\*\* |
| Age\_Group\* 2 (ref: 4) | -0.415 | 0.030 | -0.474 | -0.356 | < 2.00e-16 | \*\*\* |
| Age\_Group\* 3 (ref: 4) | -0.003 | 0.032 | -0.066 | 0.060 | 9.24e-1 |  |
| Age\_Group\* 5 (ref: 4) | 0.089 | 0.022 | 0.046 | 0.132 | 3.62e-5 | \*\*\* |
| Age\_Group\* 6 (ref: 4) | -0.044 | 0.030 | -0.103 | 0.015 | 1.38e-1 |  |
| Season High (ref: Low) | 0.544 | 0.017 | 0.511 | 0.577 | < 2.00e-16 | \*\*\* |
| Sex Female (ref: Male) | -0.209 | 0.017 | -0.242 | -0.176 | < 2.00e-16 | \*\*\* |
| Log(theta) | 1.884 | 0.070 | 1.747 | 2.021 | < 2.00e-16 | \*\*\* |
| *Zero component* |  |  |  |  |  |  |
| (Intercept) | -8.883 | 0.009 | -8.901 | -8.865 | <2.00e-16 | \*\*\* |

† Standard Error, ‡ Significant codes: ‘\*\*\*’ < 0.001, ‘\*\*’ < 0.01, ‘\*’ < 0.05, ‘.’ < 0.1

\* Age\_Group: less than 5 years (1), 5-17 years (2), 18-24 years (3), 25-44 years (4),

45-64 years (5), and 65+ (6) years of age

**Hurdle negative binomial with covariates in both zero and count components (Hurdle NB Full)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | Estimate | SE† | 95% Confidence Interval | | P value‡ |  |
| *Count component* |  |  |  |  |  |
| (Intercept) | -9.830 | 0.040 | -9.908 | -9.752 | < 2.00e-16 | \*\*\* |
| Year 2005 (ref: 2004) | 0.007 | 0.034 | -0.060 | 0.074 | 8.39e-1 |  |
| Year 2006 (ref: 2004) | 0.050 | 0.034 | -0.017 | 0.117 | 1.39e-1 |  |
| Year 2007 (ref: 2004) | 0.023 | 0.034 | -0.044 | 0.090 | 4.93e-1 |  |
| Year 2008 (ref: 2004) | -0.019 | 0.034 | -0.086 | 0.048 | 5.76e-1 |  |
| Year 2009 (ref: 2004) | 0.002 | 0.034 | -0.065 | 0.069 | 9.44e-1 |  |
| Year 2010 (ref: 2004) | 0.055 | 0.033 | -0.010 | 0.120 | 9.70e-1 | . |
| Year 2011 (ref: 2004) | 0.135 | 0.033 | 0.070 | 0.200 | 3.92e-5 | \*\*\* |
| State CO (ref: GA) | 0.827 | 0.037 | 0.754 | 0.900 | < 2.00e-16 | \*\*\* |
| State CT (ref: GA) | 0.815 | 0.036 | 0.744 | 0.886 | < 2.00e-16 | \*\*\* |
| State MD (ref: GA) | 0.133 | 0.038 | 0.059 | 0.207 | 5.00e-4 | \*\*\* |
| State MN (ref: GA) | 0.888 | 0.034 | 0.821 | 0.955 | < 2.00e-16 | \*\*\* |
| State NM (ref: GA) | 1.024 | 0.042 | 0.942 | 1.106 | < 2.00e-16 | \*\*\* |
| State NY (ref: GA) | 0.538 | 0.038 | 0.464 | 0.612 | < 2.00e-16 | \*\*\* |
| State OR (ref: GA) | 1.003 | 0.034 | 0.936 | 1.070 | < 2.00e-16 | \*\*\* |
| State TN (ref: GA) | -0.002 | 0.044 | -0.088 | 0.084 | 9.72e-1 |  |
| Age\_Group\* 1 (ref: 4) | 0.600 | 0.029 | 0.543 | 0.657 | < 2.00e-16 | \*\*\* |
| Age\_Group\* 2 (ref: 4) | -0.415 | 0.030 | -0.474 | -0.356 | < 2.00e-16 | \*\*\* |
| Age\_Group\* 3 (ref: 4) | -0.003 | 0.032 | -0.066 | 0.060 | 9.24e-1 |  |
| Age\_Group\* 5 (ref: 4) | 0.089 | 0.022 | 0.046 | 0.132 | 3.62e-5 | \*\*\* |
| Age\_Group\* 6 (ref: 4) | -0.044 | 0.030 | -0.103 | 0.015 | 1.38e-1 |  |
| Season High (ref: Low) | 0.544 | 0.017 | 0.511 | 0.577 | < 2.00e-16 | \*\*\* |
| Sex Female (ref: Male) | -0.209 | 0.017 | -0.242 | -0.176 | < 2.00e-16 | \*\*\* |
| Log(theta) | 1.884 | 0.070 | 1.747 | 2.021 | < 2.00e-16 | \*\*\* |
| *Zero component* |  |  |  |  |  |  |
| (Intercept) | -9.656 | 0.040 | -9.734 | -9.578 | < 2.00e-16 | \*\*\* |
| Year 2005 (ref: 2004) | -0.046 | 0.039 | -0.122 | 0.030 | 2.35e-1 |  |
| Year 2006 (ref: 2004) | -0.043 | 0.039 | -0.119 | 0.033 | 2.65e-1 |  |
| Year 2007 (ref: 2004) | -0.005 | 0.039 | -0.081 | 0.071 | 9.05e-1 |  |
| Year 2008 (ref: 2004) | 0.014 | 0.038 | -0.060 | 0.088 | 7.21e-1 |  |
| Year 2009 (ref: 2004) | 0.081 | 0.038 | 0.007 | 0.155 | 3.50e-2 | \* |
| Year 2010 (ref: 2004) | 0.072 | 0.038 | -0.002 | 0.146 | 5.80e-2 | . |
| Year 2011 (ref: 2004) | 0.106 | 0.038 | 0.032 | 0.180 | 5.00e-3 | \*\* |
| State CO (ref: GA) | 1.525 | 0.074 | 1.380 | 1.670 | < 2.00e-16 | \*\*\* |
| State CT (ref: GA) | 1.154 | 0.064 | 1.029 | 1.279 | < 2.00e-16 | \*\*\* |
| State MD (ref: GA) | 0.272 | 0.041 | 0.192 | 0.352 | 4.27e-11 | \*\*\* |
| State MN (ref: GA) | 1.114 | 0.029 | 1.057 | 1.171 | < 2.00e-16 | \*\*\* |
| State NM (ref: GA) | 1.032 | 0.039 | 0.956 | 1.108 | < 2.00e-16 | \*\*\* |
| State NY (ref: GA) | 0.908 | 0.035 | 0.839 | 0.977 | < 2.00e-16 | \*\*\* |
| State OR (ref: GA) | 1.250 | 0.036 | 1.179 | 1.321 | < 2.00e-16 | \*\*\* |
| State TN (ref: GA) | 0.096 | 0.031 | 0.035 | 0.157 | 2.00e-3 | \*\* |
| Age\_Group\* 1 (ref: 4) | 0.850 | 0.032 | 0.787 | 0.913 | < 2.00e-16 | \*\*\* |
| Age\_Group\* 2 (ref: 4) | -0.344 | 0.032 | -0.407 | -0.281 | < 2.00e-16 | \*\*\* |
| Age\_Group\* 3 (ref: 4) | -0.085 | 0.034 | -0.152 | -0.018 | 1.30e-2 | \* |
| Age\_Group\* 5 (ref: 4) | -0.069 | 0.030 | -0.128 | -0.010 | 2.20e-2 | \* |
| Age\_Group\* 6 (ref: 4) | -0.295 | 0.033 | -0.360 | -0.230 | < 2.00e-16 | \*\*\* |
| Season High (ref: Low) | 0.644 | 0.019 | 0.607 | 0.681 | < 2.00e-16 | \*\*\* |
| Sex Female (ref: Male) | -0.328 | 0.019 | -0.365 | -0.291 | < 2.00e-16 | \*\*\* |

† Standard Error, ‡ Significant codes: ‘\*\*\*’ < 0.001, ‘\*\*’ < 0.01, ‘\*’ < 0.05, ‘.’ < 0.1

\* Age\_Group: less than 5 years (1), 5-17 years (2), 18-24 years (3), 25-44 years (4),

45-64 years (5), and 65+ (6) years of age