Appendix to:

Appendix Table 1: Day Senior Residents: Mixed-Effects Negative Binomial Regression Model Adjusted for Calendar Variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>SE</th>
<th>Z score</th>
<th>P</th>
<th>95% CI for Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1 Reference</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 2</td>
<td>0.1681</td>
<td>0.0576</td>
<td>2.92</td>
<td>.003</td>
<td>0.0553 – 0.2809</td>
</tr>
<tr>
<td>Year 3</td>
<td>0.2561</td>
<td>0.0565</td>
<td>4.53</td>
<td>&lt;.001</td>
<td>0.1453 – 0.3670</td>
</tr>
<tr>
<td>Year 4</td>
<td>0.4378</td>
<td>0.0545</td>
<td>8.03</td>
<td>&lt;.001</td>
<td>0.3310 – 0.5447</td>
</tr>
<tr>
<td>Year 5</td>
<td>0.5281</td>
<td>0.0538</td>
<td>9.82</td>
<td>&lt;.001</td>
<td>0.4227 – 0.6335</td>
</tr>
<tr>
<td>Holiday(1)</td>
<td>-0.5581</td>
<td>0.1317</td>
<td>-4.24</td>
<td>&lt;.001</td>
<td>-0.8163 – -0.3000</td>
</tr>
<tr>
<td>Sunday(2)</td>
<td>-0.5872</td>
<td>0.0583</td>
<td>-10.08</td>
<td>&lt;.001</td>
<td>-0.7014 - -0.4730</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Random Effect</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician</td>
<td>1.72e-33(3)</td>
<td>4.91e-18</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(1) July 4th, Labor Day, Thanksgiving, Black Friday, Christmas Eve, Christmas, New Year’s Day, Martin Luther King Day, Memorial Day vs nonholidays

(2) Sunday vs all other days of the week

(3) 1.72e-33 denotes $1.72 \times 10^{-33}$, which is equivalent to a decimal point followed by 32 zeros and then 172 (ie, essentially 0). A variance of 0 signifies no evidence of black or white cloud physicians. When the variance is essentially 0, $Z$ scores, $P$ values, and confidence intervals are not calculated.
Appendix Table 2: Day Junior Residents #1: Mixed Effects Negative Binomial Regression Model Adjusted for Calendar Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>SE</th>
<th>Z score</th>
<th>P</th>
<th>95% CI for Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>Reference</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 2</td>
<td>0.1645</td>
<td>0.0579</td>
<td>2.84</td>
<td>.004</td>
<td>0.0510 – 0.2779</td>
</tr>
<tr>
<td>Year 3</td>
<td>0.2555</td>
<td>0.0569</td>
<td>4.49</td>
<td>&lt;.001</td>
<td>0.1441 – 0.3670</td>
</tr>
<tr>
<td>Year 4</td>
<td>0.4323</td>
<td>0.0553</td>
<td>7.82</td>
<td>&lt;.001</td>
<td>0.3240 – 0.5406</td>
</tr>
<tr>
<td>Year 5</td>
<td>0.5260</td>
<td>0.0540</td>
<td>9.74</td>
<td>&lt;.001</td>
<td>0.4202 – 0.6318</td>
</tr>
<tr>
<td>Holiday(1)</td>
<td>-0.5560</td>
<td>0.1318</td>
<td>-4.25</td>
<td>&lt;.001</td>
<td>-0.8180 - -0.3015</td>
</tr>
<tr>
<td>Sunday(2)</td>
<td>-0.5957</td>
<td>0.0588</td>
<td>-10.13</td>
<td>&lt;.001</td>
<td>-0.7109 - -0.4805</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Variance</th>
<th>SE</th>
<th>95% CI for Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician</td>
<td>3.56e-34(3)</td>
<td>1.18e-18</td>
<td></td>
</tr>
</tbody>
</table>

(1) July 4th, Labor Day, Thanksgiving, Black Friday, Christmas Eve, Christmas, New Year’s Day, Martin Luther King Day, Memorial Day vs nonholidays

(2) Sunday vs. all other days of the week

(3) 3.56e-34 denotes 3.56 x 10^{-34}, which is equivalent to a decimal point followed by 33 zeros and then 356 (ie, essentially 0). A variance of 0 signifies no evidence of black or white cloud physicians. When the variance is essentially 0, Z scores, P values, and confidence intervals are not calculated.
Appendix Table 3: Day Junior Residents #2: Mixed-Effects Negative Binomial Regression Model Adjusted for Calendar Variables

<table>
<thead>
<tr>
<th>Fixed Effects</th>
<th>Variable</th>
<th>Coefficient</th>
<th>SE</th>
<th>Z score</th>
<th>P</th>
<th>95% CI for Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year 1</td>
<td>Reference</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Year 2</td>
<td>0.1676</td>
<td>0.0576</td>
<td>2.91</td>
<td>.004</td>
<td>0.0547 – 0.2805</td>
</tr>
<tr>
<td></td>
<td>Year 3</td>
<td>0.2570</td>
<td>0.0565</td>
<td>4.55</td>
<td>&lt;.001</td>
<td>0.1462 – 0.3677</td>
</tr>
<tr>
<td></td>
<td>Year 4</td>
<td>0.4387</td>
<td>0.0545</td>
<td>8.05</td>
<td>&lt;.001</td>
<td>0.3319 – 0.5455</td>
</tr>
<tr>
<td></td>
<td>Year 5</td>
<td>0.5270</td>
<td>0.0537</td>
<td>9.81</td>
<td>&lt;.001</td>
<td>0.4218 – 0.6322</td>
</tr>
<tr>
<td></td>
<td>Holiday(1)</td>
<td>-0.5572</td>
<td>0.1315</td>
<td>-4.24</td>
<td>&lt;.001</td>
<td>-0.8149 - -0.2996</td>
</tr>
<tr>
<td></td>
<td>Sunday(2)</td>
<td>-0.5896</td>
<td>0.0582</td>
<td>-10.12</td>
<td>&lt;.001</td>
<td>-0.7037 - -0.4754</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Random Effect</th>
<th>Variable</th>
<th>Variance</th>
<th>SE</th>
<th>95% CI for Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Physician</td>
<td>2.63e-30(3)</td>
<td>5.89e-16</td>
<td></td>
</tr>
</tbody>
</table>

1. July 4th, Labor Day, Thanksgiving, Black Friday, Christmas Eve, Christmas, New Year’s Day, Martin Luther King Day, Memorial Day vs nonholidays

2. Sunday vs all other days of the week

3. 2.63e-30 denotes $2.63 \times 10^{-30}$, which is equivalent to a decimal point followed by 29 zeros and then 263 (ie, essentially 0). A variance of 0 signifies no evidence of black or white cloud physicians. When the variance is essentially 0, Z scores, P values, and confidence intervals are not calculated.
Appendix Table 4: Day Attending Physicians: Mixed-Effects Negative Binomial Regression Model Adjusted for Calendar Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>SE</th>
<th>Z score</th>
<th>P</th>
<th>95% CI for Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>Reference</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 2</td>
<td>0.1729</td>
<td>0.0579</td>
<td>2.99</td>
<td>.003</td>
<td>0.0594 – 0.2864</td>
</tr>
<tr>
<td>Year 3</td>
<td>0.2578</td>
<td>0.0569</td>
<td>4.53</td>
<td>&lt;.001</td>
<td>0.1463 – 0.3694</td>
</tr>
<tr>
<td>Year 4</td>
<td>0.4436</td>
<td>0.0549</td>
<td>8.07</td>
<td>&lt;.001</td>
<td>0.3359 – 0.5513</td>
</tr>
<tr>
<td>Year 5</td>
<td>0.5428</td>
<td>0.0539</td>
<td>10.06</td>
<td>&lt;.001</td>
<td>0.4371 – 0.6485</td>
</tr>
<tr>
<td>Holiday(1)</td>
<td>-0.5581</td>
<td>0.1317</td>
<td>-4.24</td>
<td>&lt;.001</td>
<td>-0.8161 - -0.3000</td>
</tr>
<tr>
<td>Sunday(2)</td>
<td>-0.5889</td>
<td>0.0585</td>
<td>-10.07</td>
<td>&lt;.001</td>
<td>-0.7035 - -0.4743</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Variance</th>
<th>SE</th>
<th>95% CI for Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician</td>
<td>1.29e-30(3)</td>
<td>4.79e-17</td>
<td></td>
</tr>
</tbody>
</table>

(1) July 4th, Labor Day, Thanksgiving, Black Friday, Christmas Eve, Christmas, New Year’s Day, Martin Luther King Day, Memorial Day vs nonholidays

(2) Sunday vs all other days of the week

(3) 1.29e-30 denotes 1.29 x 10^{-30}, which is equivalent to a decimal point followed by 29 zeros and then 129 (ie, essentially 0). A variance of 0 signifies no evidence of black or white cloud physicians. When the variance is essentially 0, Z scores, P values, and confidence intervals are not calculated.
Appendix Table 5: Night Senior Residents: Mixed-Effects Negative Binomial Regression Model Adjusted for Calendar Variables

### Fixed Effects

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>SE</th>
<th>Z score</th>
<th>P</th>
<th>95% CI for Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>Reference</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 2</td>
<td>-0.1100</td>
<td>0.0786</td>
<td>-1.40</td>
<td>.16</td>
<td>-0.2641 – 0.0440</td>
</tr>
<tr>
<td>Year 3</td>
<td>0.0866</td>
<td>0.0773</td>
<td>1.12</td>
<td>.26</td>
<td>-0.0649 – 0.2380</td>
</tr>
<tr>
<td>Year 4</td>
<td>0.0856</td>
<td>0.0774</td>
<td>1.11</td>
<td>.27</td>
<td>-0.0661 – 0.2373</td>
</tr>
<tr>
<td>Year 5</td>
<td>0.2226</td>
<td>0.0767</td>
<td>2.90</td>
<td>.004</td>
<td>0.0722 – 0.3730</td>
</tr>
<tr>
<td>Holiday(1)</td>
<td>0.1615</td>
<td>0.1365</td>
<td>1.18</td>
<td>.24</td>
<td>-0.1061 – 0.4290</td>
</tr>
<tr>
<td>Sunday(2)</td>
<td>0.2199</td>
<td>0.0615</td>
<td>3.58</td>
<td>&lt;.001</td>
<td>0.0995 – 0.3404</td>
</tr>
</tbody>
</table>

### Random Effect

<table>
<thead>
<tr>
<th>Variable</th>
<th>Variance</th>
<th>SE</th>
<th>95% CI for Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician</td>
<td>0.0039</td>
<td>0.0059</td>
<td>0.0002 – 0.0763(3)</td>
</tr>
</tbody>
</table>

(1) July 4th, Labor Day, Thanksgiving, Black Friday, Christmas Eve, Christmas, New Year’s Day, Martin Luther King Day, Memorial Day vs nonholidays

(2) Sunday vs. all other days of the week

(3) The confidence interval does not cross 0, indicating a significant physician effect, but in followup testing, no individual physician had a statistically significant regression coefficient.
Appendix Table 6: Night Junior Residents: Mixed-Effects Negative Binomial Regression Model Adjusted for Calendar Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>SE</th>
<th>Z score</th>
<th>P</th>
<th>95% CI for Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>Reference</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 2</td>
<td>-0.0911</td>
<td>0.0783</td>
<td>-1.16</td>
<td>.25</td>
<td>-0.2447 – 0.0625</td>
</tr>
<tr>
<td>Year 3</td>
<td>0.0937</td>
<td>0.0755</td>
<td>1.24</td>
<td>.21</td>
<td>-0.0542 – 0.2415</td>
</tr>
<tr>
<td>Year 4</td>
<td>0.0914</td>
<td>0.0754</td>
<td>1.21</td>
<td>.23</td>
<td>-0.0564 – 0.2393</td>
</tr>
<tr>
<td>Year 5</td>
<td>0.2355</td>
<td>0.0736</td>
<td>3.20</td>
<td>.001</td>
<td>0.0913 – 0.3797</td>
</tr>
<tr>
<td>Holiday(1)</td>
<td>0.1715</td>
<td>0.1378</td>
<td>1.24</td>
<td>.21</td>
<td>-0.0986 – 0.4416</td>
</tr>
<tr>
<td>Sunday(2)</td>
<td>0.2222</td>
<td>0.0617</td>
<td>3.60</td>
<td>&lt;.001</td>
<td>0.1013 – 0.3432</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Variance</th>
<th>SE</th>
<th>95% CI for Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician</td>
<td>6.79e-33(3)</td>
<td>4.79e-18</td>
<td></td>
</tr>
</tbody>
</table>

(1) July 4th, Labor Day, Thanksgiving, Black Friday, Christmas Eve, Christmas, New Year’s Day, Martin Luther King Day, Memorial Day vs. nonholidays

(2) Sunday vs all other days of the week

(3) 6.79e-33 denotes 6.79 x 10^-33, which is equivalent to a decimal point followed by 32 zeros and then 679 (ie, essentially 0). A variance of 0 signifies no evidence of black or white cloud physicians. When the variance is essentially 0, Z scores, P values, and confidence intervals are not calculated.
Appendix Table 7: Night Attending Physicians: Mixed-Effects Negative Binomial Regression Model Adjusted for Calendar Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>SE</th>
<th>Z score</th>
<th>P</th>
<th>95% CI for Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>Reference</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 2</td>
<td>-0.1105</td>
<td>0.0773</td>
<td>-1.43</td>
<td>.15</td>
<td>-0.2621 – 0.0411</td>
</tr>
<tr>
<td>Year 3</td>
<td>0.0919</td>
<td>0.0742</td>
<td>1.24</td>
<td>.22</td>
<td>-0.0535 – 0.2373</td>
</tr>
<tr>
<td>Year 4</td>
<td>0.0721</td>
<td>0.0745</td>
<td>0.97</td>
<td>.33</td>
<td>-0.0739 – 0.2180</td>
</tr>
<tr>
<td>Year 5</td>
<td>0.1914</td>
<td>0.0732</td>
<td>2.61</td>
<td>.009</td>
<td>0.0479 – 0.3348</td>
</tr>
<tr>
<td>Holiday(1)</td>
<td>0.1565</td>
<td>0.1388</td>
<td>1.13</td>
<td>.26</td>
<td>-0.1155 – 0.4286</td>
</tr>
<tr>
<td>Sunday(2)</td>
<td>0.2037</td>
<td>0.0627</td>
<td>3.25</td>
<td>.001</td>
<td>0.0809 – 0.3265</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Variance</th>
<th>SE</th>
<th>95% CI for Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician</td>
<td>0.0022</td>
<td>0.0050</td>
<td>0.00003 – 0.18154(3)</td>
</tr>
</tbody>
</table>

(1) July 4th, Labor Day, Thanksgiving, Black Friday, Christmas Eve, Christmas, New Year’s Day, Martin Luther King Day, Memorial Day vs nonholidays

(2) Sunday vs. all other days of the week

(3) The confidence interval for the variance did not cross 0, indicating significant variability among physicians, but in followup testing, no individual physician had a significant regression coefficient, and therefore no black or white cloud physicians were identified.