**Table S1 Inference from INLA for synthetic Poisson data.** Simulated under model $y_i \mid \lambda_i \sim \text{Pois}(n_i, \lambda_i)$, $\eta_i = \log(\lambda_i) = \beta_0 + u_i$, with $\beta_0 = 0$, levels of $\sigma_u^2$ ranging from 0 to 1, and missing pattern similar to the house sparrow Poisson case study. $\hat{\sigma}_u^2$ is the posterior mean additive genetic variance with standard deviations (sd), and 95% credible interval (CI).

<table>
<thead>
<tr>
<th>$\sigma_u^2$</th>
<th>$\hat{\sigma}_u^2$ (sd)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.08 (0.02)</td>
<td>(0.05, 0.13)</td>
</tr>
<tr>
<td>0.05</td>
<td>0.09 (0.02)</td>
<td>(0.05, 0.13)</td>
</tr>
<tr>
<td>0.1</td>
<td>0.12 (0.03)</td>
<td>(0.07, 0.18)</td>
</tr>
<tr>
<td>0.15</td>
<td>0.14 (0.03)</td>
<td>(0.09, 0.21)</td>
</tr>
<tr>
<td>0.2</td>
<td>0.20 (0.04)</td>
<td>(0.13, 0.27)</td>
</tr>
<tr>
<td>0.3</td>
<td>0.33 (0.05)</td>
<td>(0.25, 0.43)</td>
</tr>
<tr>
<td>0.4</td>
<td>0.43 (0.05)</td>
<td>(0.33, 0.54)</td>
</tr>
<tr>
<td>0.5</td>
<td>0.53 (0.06)</td>
<td>(0.43, 0.65)</td>
</tr>
<tr>
<td>0.6</td>
<td>0.60 (0.06)</td>
<td>(0.49, 0.73)</td>
</tr>
<tr>
<td>0.7</td>
<td>0.68 (0.06)</td>
<td>(0.56, 0.81)</td>
</tr>
<tr>
<td>0.8</td>
<td>0.84 (0.08)</td>
<td>(0.69, 1.00)</td>
</tr>
<tr>
<td>0.9</td>
<td>0.91 (0.08)</td>
<td>(0.77, 1.08)</td>
</tr>
<tr>
<td>1</td>
<td>0.99 (0.09)</td>
<td>(0.83, 1.17)</td>
</tr>
</tbody>
</table>