

Start

$$\theta_{i1} := \begin{cases} \theta_{i2}, & i \in \mathcal{M}_0 \\ \alpha_i \theta_{i2}, & i \in \mathcal{M}_1 \end{cases}, \quad \theta_{i2} \sim \text{GAM}(a, 1)$$

$$A_{ijk} | \theta_{ij} \sim \text{POI}(\theta_{ij})$$

$$A_{.jk} = \sum_i A_{ijk}$$

$$O_{.jk} = p_{jk} \max_{j,k} A_{.jk}$$

$$O_{ijk} \sim \text{BIN}(O_{.jk}, \gamma_{ijk})$$

$$d_{jk} = \log \frac{O_{.jk}}{A_{.jk}}$$

DA Analysis

$$\hat{d}_{jk}$$

$$r_{jk} = \hat{d}_{jk} - d_{jk}$$

$$r_{jk}^* = r_{jk} - \bar{r}_{..}$$

Boxplot of r_{jk}^*