$$
\begin{aligned}
\mathrm{N}_i &\sim \text{Gamma-Poisson}(\mu, \phi) \\
\mathrm{V}_{\text{exp}} &= \mathrm{EV}(\mathrm{N}_i) \\
\lambda_i &= \mathrm{V}_{\text{exp}} + \mathrm{erf}(\mathrm{A}_i)\mathrm{V}_{\text{exp}}(1 - \frac{\mathrm{V}_{\text{exp}}}{\mathrm{N}_i}) \\
\mathrm{V}_i &\sim \text{Poisson}(\lambda_i)
\end{aligned}
$$

$$
\begin{aligned}
\mu_i &= \beta \, \text{logistic}(A) \\
\mathrm{N}_i &\sim \text{Gamma-Poisson}(\mu, \phi) \\
\mathrm{V}_{\text{exp}} &= \mathrm{EV}(\mathrm{N}_i) \\
\lambda_i &= \mathrm{V}_{\text{exp}} + \mathrm{erf}(\mathrm{A}_i)\mathrm{V}_{\text{exp}}(1 - \frac{\mathrm{V}_{\text{exp}}}{\mathrm{N}_i}) \\
\mathrm{V}_i &\sim \text{Poisson}(\lambda_i)
\end{aligned}
$$