$$
\begin{aligned}
g(\boldsymbol{\beta}, z_i) &= e^{\beta_0 + \beta_1 z_i} \\
[\boldsymbol{\alpha}, \boldsymbol{\beta}, \mathbf{z}, \varsigma^2 \mid \mathbf{y}, \mathbf{x}] &\propto \prod_{i=1}^{100} [y_i \mid g(\boldsymbol{\beta}, z_i)][x_i | h(\boldsymbol{\alpha}, z_i), \varsigma^2][\boldsymbol{\alpha}, \boldsymbol{\beta}, \mathbf{z}, \varsigma^2] \\
y_i &\sim \text{Poisson}(g(\boldsymbol{\beta}, z_i)) \\
x_i &\sim \text{beta}\big(m(h(\boldsymbol{\alpha}, z_i)), \varsigma^2\big) \\
&\times \text{appropriate priors}
\end{aligned}
$$