

Poisson regression

$$\alpha = 1 \quad \Theta = \log(\mu) \quad V(\mu) = \mu = e^\Theta$$

$$g(\mu) = \log(\mu) \quad g'(\mu) = 1/\mu \quad \eta_i^{(\alpha-1)} = \underline{X}_i' \beta^{(\alpha-1)}$$

$$Z_i^{(\alpha-1)} = \eta_i^{(\alpha-1)} + (y_i - e^{\eta_i^{(\alpha-1)}}) \left( e^{-\eta_i^{(\alpha-1)}} \right)$$

$$W_i^{(\alpha-1)} = \frac{1}{\alpha \cdot V(\mu_i) [g'(\mu_i)]^2} = \frac{(\mu_i)^{\alpha-1}}{(\mu_i)^2 [1/\mu_i]^2} = \mu_i^{\alpha-1} = e^{\eta_i^{(\alpha-1)}}$$