

$$Y_i = \beta_0 + \beta_1 X_1 + \dots + \beta_K X_K + \varepsilon_i$$

$$\varepsilon_i \sim N(0, \sigma^2)$$

$$\mu_i = E(Y_i) = X\beta$$

general
linear regression

$$g(\mu_i) = X\beta$$

$$g(\mu_i) = \mu_i \quad (\text{Identity link})$$

$$g(x) = x$$

$$Y \sim \text{Negative Binomial}(\mu, \phi)$$

$$V(Y) = \mu + \mu^2 k = \mu(1 + k\mu)$$

$k=0$, no overdispersion.