

I am interested in predicting the probability of someone practicing an adaptive behavior given individual characteristics and community-level characteristics. This is a dichotomous outcome, where 1 indicates the individual has engaged in the practice and 0 indicates that they have not. I am interested in estimating $P(y_i) = 1$.

The **likelihood** function can be specified as follows:

$$likelihood_i = \pi(x_i)^{y_i} (1 - \pi(x_i))^{1-y_i} \quad (1)$$

where $\pi(x_i)$ is the probability of an event i given a covariate vector x_i . This probability can be written as:

$$\pi(x) = \frac{e^{\beta_0 + \beta_1 x_1 \dots}}{1 + e^{\beta_0 + \beta_1 x_1 \dots}} \quad (2)$$

Our **priors** are the β coefficients and the parameters that describe their structure. If we have no prior information for our β coefficients, as is the case in Sri Lanka, we can specify the priors as non-informative, following a normal distribution, $\beta_n \sim N(\mu_n, \sigma_n^2)$. It is standard to specify μ_n as zero and the variance as large enough to be non-informative ($10 < \sigma_j < 100$).