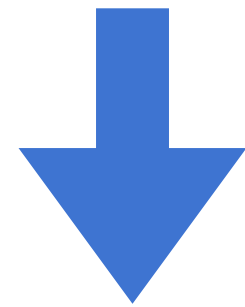# Redefining The Response

original Y

Y as probability
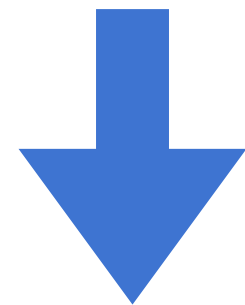
odds of Y
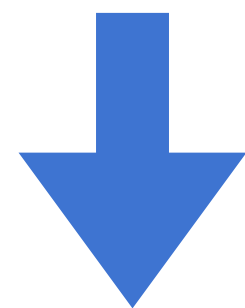
$Y' \in (-\infty, \infty)$

0   1
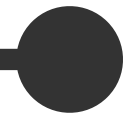
0   1

0   ∞

$-\infty$ ∞

Logistic Regression

$$y = X\beta$$

$$y = g^{-1}(X\beta)$$

general case

$$p = \frac{e^{X\beta}}{1 + e^{X\beta}}$$

specific case

our link function is

$$g(x) = \log \frac{x}{1-x}$$

which has the inverse

$$g^{-1}(x) = \frac{e^x}{1 + e^x}$$