

3/3/22

Berkeley Example: ~ Program

fitted model:  $\pi$  = probability of admission

$$\log\left(\frac{\hat{\pi}}{1-\hat{\pi}}\right) = 0.589 - 0.053B - 1.204C - 1.234D - 1.669E - 3.264F$$

↑  
estimated  
log-odds of  
admission

where  $P = \begin{cases} 1 & \text{Program P} \\ 0 & \text{else} \end{cases}$

where  $P = B, C, D, E, F$

$$\hat{\beta}_{6 \times 1} = \begin{bmatrix} \hat{\beta}_0 \\ \hat{\beta}_1 \\ \hat{\beta}_2 \\ \hat{\beta}_3 \\ \hat{\beta}_4 \\ \hat{\beta}_5 \end{bmatrix}$$

← "random vector"  
(before data collection)

Observed:  $\hat{\beta} = \begin{bmatrix} 0.589 \\ -0.053 \\ \vdots \\ -3.264 \end{bmatrix}$

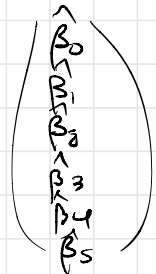
Odds ratio comparing program C to program B:

$$\frac{\text{odds admit} | C}{\text{odds admit} | B} \xrightarrow{\text{estimate}} \frac{e^{\hat{\beta}_0 + \hat{\beta}_2}}{e^{\hat{\beta}_0 + \hat{\beta}_1}} = e^{\hat{\beta}_2 - \hat{\beta}_1}$$

$$\hat{\beta}_2 - \hat{\beta}_1 = A \hat{\beta} = \begin{bmatrix} 0 & -1 & 1 & 0 & 0 & 0 \end{bmatrix}$$

R:  $\hat{\beta}$  ← Coef(mod)

$\widehat{\text{Var}}(\hat{\beta})$  ← Vcov(mod)



# Model Comparison Tests Based on Deviance (Sec.

4.4.2 -

3.4.4)

- General GLM

$H_0$ : Reduced model  $M_R$

$H_a$ : Full model  $M_F$

$M_R$  is nested within  $M_F$   $\rightarrow$  Can obtain  $M_R$  by setting a subset of coeffs. in  $M_F$  to zero.