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Lecture 7e: Practice Problem Solutions

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Example: Breast Feeding Status and Age

1. Recall the resulting equation from our example of 238 Nepali children, relating breast feeding status to age in months

$$ln\left(\frac{p}{1-p}\right) = 7.43 + -0.25 \times Age$$

   a) Using the above estimate for the proportion of year old (12 months) children who are breast fed

$$ln\left(\frac{p}{1-p}; Age = 12\right) = 7.43 + . - .25 \times 12 = 4.43$$

   So the estimated *ln odds* is 4.43 and hence the estimated odds is $e^{4.43} \approx 84$; and the estimated probability that a year old child is breast fed (proportion of year old children who are breastfed) is . . .

$$\hat{p} = \frac{\hat{odds}}{1 + \hat{odds}} = \frac{84}{85} \approx 0.988$$

Example: Breast Feeding Status and Age

1. Recall the resulting equation from our example of 238 Nepali children, relating breast feeding status to age in months

$$ln\left(\frac{p}{1-p}\right) = 7.43 + -0.25 \times Age$$

b) Using the above estimate for the proportion of 11 month old children who are breast fed

$$ln\left(\frac{p}{1-p}; Age = 11\right) = 7.43 + . - .25 \times 11 = 4.68$$

So the estimated *ln odds* is 4.68 and hence the estimated odds is $e^{4.68} \approx 107.8$; and the estimated probability that a 11 month old child is breast fed (proportion of year old children who are breastfed) is . . .

$$\hat{p} = \frac{\hat{odds}}{1 + \hat{odds}} = \frac{107.8}{108.8} \approx 0.991$$

Example: Breast Feeding Status and Age

1. Recall the resulting equation from our example of 238 Nepali children, relating breast feeding status to age in months

$$ln\left(\frac{p}{1-p}\right) = 7.43 + -0.25 \times Age$$

c) What is the estimated relative risk of being breast fed for 12 month olds compared to 11 month olds?

$$\hat{RR} = \frac{.988}{.991} \approx 0.992$$

Example: Breast Feeding Status and Age

1. Recall the resulting equation from our example of 238 Nepali children, relating breast feeding status to age in months

$$ln\left(\frac{p}{1-p}\right) = 7.43 + -0.25 \times Age$$

d) In lecture 4c, we saw that based on the above model, the estimated odds ratio of being breast fed for 24 month old children compared to 18 month old children is 0.22; what is the estimated relative risk for this comparison?

I'll spare the detailed computations this time but if you go through similar math as the previous two slides, the estimated relative risk is:

$$R\hat{R} = \frac{\hat{p}_{24mos}}{\hat{p}_{18mos}} = \frac{.81}{.95} \approx 0.86$$

Example: Breast Feeding Status and Age

1. Recall the resulting equation from our example of 238 Nepali children, relating breast feeding status to age in months

$$ln\left(\frac{p}{1-p}\right) = 7.43 + -0.25 \times Age$$

e) If we were to compare 12 month olds to 6 month olds based on the above model, the estimated odds ratio of being breast fed for this age comparison is also 0.22: what is the estimated relative risk for this comparison?

Again I'll spare the detailed computations this time but if you go through similar math as the previous slides, the estimated relative risk is:

$$\hat{RR} = \frac{\hat{p}_{12mos}}{\hat{p}_{6mos}} = \frac{.988}{.997} \approx 0.991$$