JOHNS HOPKINS BLOOMBERG SCHOOL of PUBLIC HEALTH

Lecture 4c: Practice Problem Solutions

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Example: Wages and Education Level

1. Recall equation of regression line relating estimated mean hourly wages (U.S. $, 1985) to years of education: from Stata . . .

$$\hat{y} = -0.75 + 0.75x$$

a) What is the estimated mean hourly wage (in 1985) for persons with 12 years of education?

This estimate can be computed by plugging 12 in for x in the above equation: $\hat{y} = -0.75 + 0.75 \times 12 = \$8.25/hr$

b) What is the estimated difference in hourly wages (in 1985) for persons with 16 years of education versus 12 years of education?

These two groups differ by four years (i.e., four units of x): so the resulting estimated mean difference in wages is

$$(16-12) \times \hat{\beta}_1 = 4 \times .75 = \$3.00/hr$$

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Example: Arm Circumference and Sex

2. Recall the regression relating arm circumference to child's sex for the random sample of 150 Nepali children less than 12 months old

$$\hat{y} = 12.5 + -0.13x$$

- In this example, x is the binary variable for sex, coded as a 1 for female children and 0 for male children; suppose x was coded as 1 for male children and 0 for female children

a) What would the resulting slope estimate be?

The resulting slope estimate would compare the mean difference in arm circumference for males relative to females: this would be 0.13.

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b) What would the resulting intercept estimate be?

The resulting intercept would be an estimate of the mean arm circumference for children with x = 0, i.e., female children. Based on the results of the above model, this value would be 12.5 - 0.13, or 12.37 cm.

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