

## Homework 3 - Question 2b

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### Question 2.b.

z test of coefficients:

Estimate Std. Error z value Pr(>|z|)

age1 0.0199 0.0175 1.14 0.255

educ1 0.0963 0.0542 1.78 0.075 .

health1 0.3581 0.1607 2.23 0.026

1 | 2 1.0043 1.5613 0.64 0.520

2 | 3 2.2056 1.5567 1.42 0.157

3 | 4 4.0020 1.5678 2.55 0.011

Signif. codes: 0 '0.001' '0.01' '0.05' '.' 0.1 '1'

Table 1: Cumulative Logistic Model: `polr(formula = factor(incadq1) ~ age1 + educ1 + health1, data = dat, contrasts = NULL, method = 'logistic')`

	Coefficient	SE	T-Value
age1	0.0199	0.0175	1.1392
educ1	0.0963	0.0542	1.7781
health1	0.3581	0.1607	2.2280
1   2	1.0043	1.5613	0.6433
2   3	2.2056	1.5567	1.4169
3   4	4.0020	1.5678	2.5526

### MODEL FIT INDICES

Table 2: Likelihood Ratio  $\chi^2$

Log Likelihood	df	$\chi^2$	p
-360.6	3	9.379	0.0247

Table 3: Logistic Regression Coefficients ( $\beta$ ) & Corresponding Confidence Intervals (CI)

		$CI_{\beta}$	
	$\beta$	2.5 %	97.5 %
age1	0.0199	-0.0143	0.0544
educ1	0.0963	-0.009	0.2037
health1	0.3581	0.0457	0.6769

Table 4: Logistic Regression Odds Ratios ( $\Phi$ ) & Corresponding Confidence Intervals (CI) <sup>1</sup>

		$CI_{\Phi}$	
	$\Phi$	2.5 %	97.5 %
age1	1.0201	0.9858	1.0559
educ1	1.1011	0.991	1.2259
health1	1.4306	1.0468	1.9678

**Note:**

<sup>1</sup> Confidence intervals are based on the logistic regression model's profiled log-likelihood function, rather than the standard errors

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CUMULATIVE LOGISTIC REGRESSION SUMMARY. An ordered logistic regression model was tested to investigate whether age, education, and health at baseline predicted baseline reported income adequacy. The predictors collectively accounted for a significant amount of variance in the outcome, likelihood ratio  $\chi^2(3) = 9.379, p < .05$ . However, only baseline health independently predicted income adequacy at baseline,  $b = .3581, SE = .1607, OR = 1.4306, p < .05$ ; such that point increases in baseline health were each associated with approximately 35% increases in baseline income adequacy. Overall, the model accounted for 1.3% of the variance in reported baseline income adequacy (*McFadden's pseudo- $R^2$*  = 0.013).