**Wednesday PM, Stats Epi II Exercises**

**Training Course in MCH Epidemiology**

**Minneapolis, MN May 31-June 4, 2011**

1. The following crude, adjusted, and stratum-specific relative risks (RR) came from a study of the association between neighborhood poverty and infant low birth weight. Each row shows the results of single-factor stratified analysis for this association, with the covariate listed as the stratification variable. For each row, indicate whether the covariate is an effect modifier (EM), a confounder (C), or neither (N).

The **crude RR** for the relationship between poverty level (<100% federal poverty level (FPL) vs 100%+ FPL) and birth weight (<2500g vs 2500+g) is **1.7 (1.3, 2.2).**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Covariate** | **Stratum 1 Value** | **Stratum 2 Value** | **Stratum 1 RR (95% CI)** | **Stratum 2 RR**  **(95% CI)** | **p-value for a Test of Homogeneity** | **Adjusted RR**  **(95% CI)** | **EM, C, or N?** |
| Maternal age | <20 | 20+ | 1.0 (0.8, 1.4) | 2.0 (1.1, 3.5) | 0.04 | 1.2 (0.9, 1.5) |  |
| Maternal Smoking | Yes | No | 1.6 (1.2, 2.3) | 1.8 (1.0, 3.2) | 0.88 | 1.7 (1.3, 2.2) |  |
| Maternal Medical Risk | High risk | Low risk | 1.0 (0.6, 1.8) | 1.2 (0.7, 1.9) | 0.76 | 1.1 (0.8, 1.5) |  |
| Maternal education | <HS | HS+ | 1.2 (0.5, 1.8) | 2.3 (1.5, 3.0) | 0.11 | 1.8 (1.3, 2.3) |  |

1. The following are results from an analysis using logistic regression to examine risk factors for infant mortality using linked birth and death certificates in 5 states combined. (Each of the variables shown was either statistically significant or very close to statistically significant in the model, so do not focus on this issue.)

|  |  |  |
| --- | --- | --- |
|  | Variable labels | Beta Coefficients |
|  | Intercept | -5.52 |
| 1 | 10-19 years old | 0.47 |
| 2 | >= 20 years old and at least a high school education | -0.43 |
| 3 | Smoked during pregnancy | 0.26 |
| 4 | Alcohol drinking during pregnancy | 0.41 |
| 5 | No prenatal Care | 0.59 |
| 6 | Inadequate prenatal care | 0.26 |

All of the above variables were coded "1" and "0", with the variable label reflecting the category that was coded "1". The outcome variable—infant mortality—was also coded "1" and "0", with infant death=1 and infant survivor=0. As you can see, variables 1 and 2 are dummy variables for an age/education index. The reference group is women >= 20 years old with less than a high school education, a group with "medium" risk status. Variables 5 and 6 are dummy variables for an adequacy of prenatal care index. The reference group is women who received adequate prenatal care and is the lowest risk group.

1. Write a sentence or two interpreting the beta coefficient of –0.43 obtained for women who are >= 20 years old and who have at least a high school education. What does it tell us in the context of this multivariable model?
2. What is the odds ratio for infant mortality comparing women who do not access prenatal care compared to women receiving adequate care after adjusting for the other factors in the model?



1. GIVE IT A TRY: You are interested in knowing the odds of infant mortality among women who both smoke and drink during pregnancy compared to women who neither smoke nor drink, after adjusting for the other factors in the model. What is this odds ratio?



1. **Choosing an Analytic Approach**

A group of researchers is interested in the association between maternal smoking and infant birth weight and they are considering a number ways for analyzing the data.For each of the examples below, identify which of the following would be appropriate statistical approaches...**IDENTIFY AS MANY AS APPLY:**

* + - 1. Chi-square test for independence
      2. T test for the difference between 2 means
      3. Stratified analysis (contingency tables)
      4. Ordinary Least Squares Regression Model
      5. Logistic Regression Model

1. Which statistical approach(s) would be appropriate for analyzing the following data:

|  |  |
| --- | --- |
| Explanatory/Independent Variable(s) | Outcome/Dependent Variable |
| Maternal Smoking: > 40 cigarettes per day  20-39 cigarettes per day  1-19 cigarettes per day  Nonsmoker | Birthweight < 2500 grams: Yes  No |

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|  |  |
| --- | --- |
| Explanatory/Independent Variable(s) | Outcome/Dependent Variable |
| Maternal Smoking: > 40 cigarettes per day  20-39 cigarettes per day  1-19 cigarettes per day  Nonsmoker  Early entry into prenatal care (yes v. no) | Birth weight < 2500 grams: Yes  No |

1. Which statistical approach(s) would be appropriate for analyzing the following data:

|  |  |
| --- | --- |
| Explanatory/Independent Variable(s) | Outcome/Dependent Variable |
| Maternal Smoking : Smoker  Nonsmoker | Birth weight in Grams |
| Early entry into prenatal care (yes v. no) |

1. Which statistical approach(s) would be appropriate for analyzing the following data:

|  |  |
| --- | --- |
| Explanatory/Independent Variable(s) | Outcome/Dependent Variable |
| Maternal Smoking : Smoker | Birth weight in Grams |
| Nonsmoker |  |

1. Which statistical approach(s) would be appropriate for analyzing the following data:

|  |  |
| --- | --- |
| Explanatory/Independent Variable(s) | Outcome/Dependent Variable |
| # cigarettes smoked per day during pregnancy | Birth weight < 2500 grams: Yes  No |
| Early entry into prenatal care (yes v. no) |
| Maternal weight gain during pregnancy in pounds |