

Student Name(s): _____

School Name: _____

Team Number: _____

**Middle School
DISEASE DETECTIVES
(Alcohol)**

200 points

Answer Key

**Regional
New Jersey Science Olympiad
Competitions
2006**



Developed by
Detectives in the Classroom
Montclair State University
College of Education and Human Services

Relationship between Parental Restrictions on Movies and Adolescent Use of Tobacco and Alcohol

The description of this study was adapted from Dalton, Madeline A, et al., "Relationship between Parental Restrictions on Movies and Adolescent Use of Tobacco and Alcohol," *Effective Clinical Practice*, January / February 2002, Volume 5, Number 1, Pages 1-10. The questions are based on the same source.

Directions: After reading the summary of the epidemiological study in the box below, answer the questions that follow.

Relationship between Parental Restrictions on Movies and Adolescent Use of Tobacco and Alcohol

Context: Viewing smoking and drinking in movies may prompt adolescents to initiate these behaviors. Movies with R ratings contain more smoking than do movies in all other rating categories.

Objective: To evaluate the extent to which parents restrict the exposure of adolescents to R-rated movies and to determine whether such restrictions are associated with decreased tobacco and alcohol use in adolescents.

Design: Cross-sectional, self-administered survey.

Participants: Students in grades 5 through 8 enrolled in New Hampshire and Vermont schools.

Sampling Strategy: Fifteen schools in Vermont and New Hampshire were randomly selected from all middle schools with ≥ 150 students.

Outcome Measures: Students who had tried smoking cigarettes or tried drinking alcohol without parental knowledge. **Results:** Of 4,544 students surveyed, 801 had tried cigarettes and 1,069 had tried alcohol. Although 90% were younger than 14 years of age, only 16% were completely restricted from viewing R-rated movies. The prevalence of having tried smoking was 35% for those with no restrictions on viewing R-rated movies, 12% for those with partial restrictions, and 2% for those with complete restrictions. The prevalence of having tried alcohol was 46% for those with no restrictions on viewing R-rated movies, 16% for those with partial restrictions, and 4% for those with complete restrictions. Even after controlling for other factors, children who had no restrictions from viewing R-rated movies were significantly more likely to try smoking and alcohol compared with those who had complete restrictions.

Conclusion: Limiting the exposure of adolescents to R-rated movies may prevent early use of tobacco and alcohol.

1. What is the prevalence rate of trying alcohol among all participants in this study? (10 points)

23%

2. What is the exposure of interest in this study? (10 points)

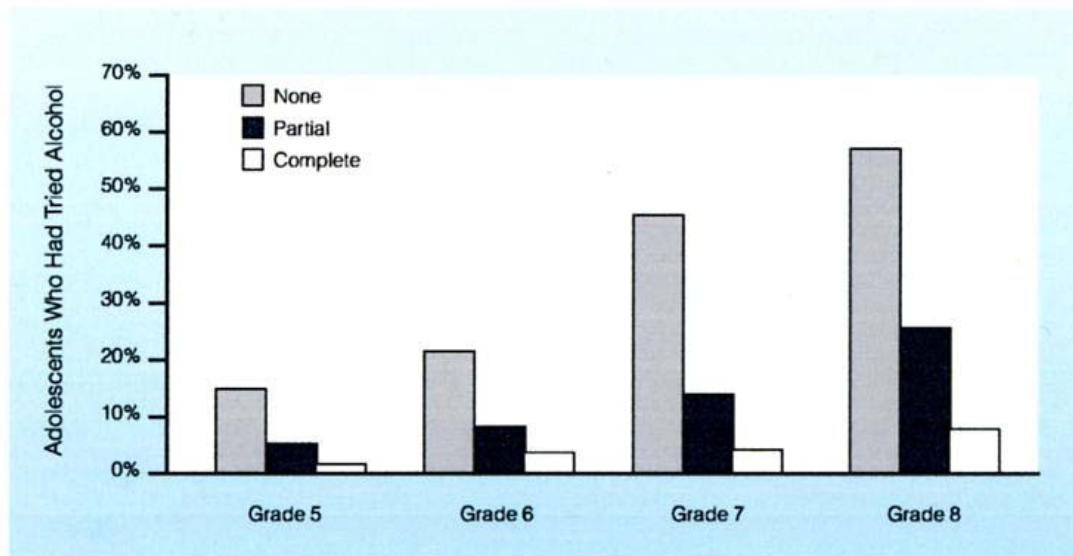
Parental restrictions on watching R-rated movies

3. Generically describe a cross-sectional study. (10 points)

A study that takes a defined population and examines relationships between diseases or other health-related events and exposures of interest, at one point in time. This is a snapshot and does not take time order into consideration.

That is, the epidemiologist, who has not been on the journey, stops the train somewhere during the trip (kind of like a train robbery) and takes a "snapshot" of all the passengers by asking them whether or not they had the exposure and whether or not they have the disease. Then the epidemiologist leaves the train and goes home to analyze the data from that particular day. The journey continues without the epidemiologist.

4. The authors present a graph to show the differences in percentages of participants who tried alcohol, by three groups of parental restrictions and also by grade. In no more than two sentences, write your interpretation of what the graph shows. (10 points)



Two main things: 1) percentages who try alcohol increase as grade level increases for all three groups; 2) these percentages are consistently greater at each grade level for those with no restrictions compared to the others.

Or, another way to say it: Children whose parents had no restrictions were more likely to have tried alcohol than children whose parents had partial restrictions. Children whose parents had complete restrictions were least likely to have tried alcohol. Also, the older children were more likely to have tried alcohol than the younger children.

5. Results can also be shown using numbers rather than percentages. For example, the authors report that 1,427 participants had no restrictions of R-rated movies, 2,402 had partial restrictions, and 715 had complete restrictions. Based on this information and the information in the summary, place the appropriate numbers in Table A below. (Round-off to the closest whole number.)

Table A: Description of Participants Who Tried / Did Not Try Alcohol

Parental Restrictions on R-Rated Movies

	No Restrictions Number = 1,427	Partial Restrictions Number = 2,402	Complete Restrictions Number = 715
Tried Alcohol	656	384	29
Did Not Try Alcohol	771	2,018	686

(6 points)

6. The 2x2 table is useful for calculating and comparing risks of having an outcome, that is, among study participants who have or do not have the exposure being studied. A risk in this example may be expressed as a percentage or proportion.

Based on the information above and in the summary, label and fill in the 2x2 table below for Trying Alcohol. Then calculate the risks and the relative risk of having no restrictions on watching R-rated movies. Write these in the appropriate boxes below. Show calculations in the space below the 2x2 table. (The group with “Partial Restrictions” is omitted.) (Round-off to two decimal places.)

	Tried Alcohol	Did Not Try Alcohol	Total	Risks	Relative Risk
No Restrictions	656	771	1,427	0.46	11.5
Complete Restrictions	29	686	715	0.04	

Show work.

(14 points)

7. In a single sentence, explain the meaning of the relative risk that you have calculated. (15 points)

Students with no restrictions were 11.5 times as likely (more likely) to have tried alcohol compared to students with complete restrictions.

The risk of trying alcohol is 11.5 times greater among participants who had no restrictions on watching R-rated movies compared to participants who had complete restrictions.

8. After controlling for grade, parental disapproval of smoking, maternal supervision, maternal responsiveness, peer and family smoking, and child personality characteristics, the relative risk changed to 3.3.

Compare this relative risk to the relative risk you calculated that did not "control for" other influences (answer to question 6). Is it larger or smaller? Does this make sense to you? Explain why or why not. Explain why or why not. (15 points)

The RR is smaller. Yes, it makes sense that, when you control for other influential factors, the strength of the association for the factor of interest will diminish. What is important is that it did not go all the way down to 1 - there does appear to be an independent effect of parental restrictions (although there may be residual confounding).

9. Identify another important factor that you would need to "control for" when testing the hypothesis that parental restrictions of young adolescents' viewing of R-rated movies lowers their use of alcohol using a cross-sectional study. (10 points)

Supervision by fathers or others, parental setting of limits about smoking and alcohol, restricting peer group affiliations

10. How does the fact that the study sample was students in grades 5 through 8 enrolled in New Hampshire and Vermont schools affect the generalizability of the results? (15 points)

We do not know. Students from New Hampshire and Vermont may be different than students from other parts of the country. A comparison of the relative risks from similar studies done in other parts of the country would help address this question. More research needs to be done.

11. In the actual article, the authors point out that 30 randomly selected schools were asked to participate in the study.

a. Why did the authors randomly select schools? (10 points)

So that these 30 schools would be representative of all the schools in New Hampshire and Vermont with grades 5 through 8 ($n = 154$). (Note that the cover story says 15, does not mention the 30 - this could cause confusion.)

b. Fifteen of the 30 randomly selected schools actually participated. How might this have affected the results? Why? (15 points)

The 15 randomly selected schools that did participate are different from the 15 randomly selected schools that did not participate. They said “yes.” These results from the 15 schools that did participate are not representative of all the other schools that were not randomly selected. They are representative of those schools who would have said “yes,” if they were asked to participate.

12. In the actual article, the authors report that “Movie restrictions were positively associated with ... *parent education*.” What does this mean? (10 points)

The greater the parental education the more likely it was that their children would be restricted from viewing R-rated movies.

13. Why would the authors collect data about *parent education*? (10 points)

Greater parental education is associated with less parental smoking which, in turn, is associated with less smoking among their children. If the researchers wanted to determine if there was an association between parental restrictions on viewing R-rated movies, viewing R-rated movies, and smoking, they would need to make sure that it was not due to greater parental education or something associated with it.

14. In the actual article, the authors report that the mean number of R-rated movies viewed was distributed as follows:

Complete Restrictions	0.9 R-rated movies
Partial Restrictions	4.0 R-rated movies
No Restrictions	7.8 R-rated movies

If the authors were interested in the affect of R-rated movie restrictions on trying alcohol, why did they collect data about the number of R-rated movies viewed? (Tie Breaker)

To test the assumption that parental restriction has worked, that is, to see if parental restriction is related to the actual number of R-rated movies that their children see.

The data suggest that the parental restrictions did work in reducing the number of R-rated movies viewed. If there was no difference in the number of R-rated movies viewed by students with different degrees of restrictions, it would suggest that the association between the restrictions and smoking was not due to the restrictions but something associated with them.

15. In the actual article, the authors report that “Smoking and drinking were (statistically) significantly associated with the level of restrictions for R-rated movies.” What does “(statistically) significantly” mean? (10 points)

The reason these two things turned up together was unlikely to be due to chance.

16. In the actual article, the authors report that “The association was independent of our measures of maternal supervision, maternal responsiveness, and parental disapproval (of smoking and drinking).”

- a. What does “independent of our measures of” mean? (10 points)

When measures of maternal supervision, maternal responsiveness, and parental disapproval (of smoking and drinking) were accounted for, there was still an association between the level of restrictions of watching R-rated movies and smoking and drinking.

- b. What does this independence imply about the affect of the movie restrictions as opposed to an overall stricter parenting style? (10 points)

That the association was still found, after accounting for the degree to which higher levels of maternal supervision, maternal responsiveness, and parental disapproval were also more likely to have high levels of restrictions of watching R-rated movies.

17. Given the conclusion that “limiting the exposure of adolescents to R-rated movies may prevent early use of tobacco and alcohol,” identify five public health strategies for limiting exposure to R-rated movies. (10 points)
- a. Make parents aware that restrictions on viewing R-rated movies seem to actually work in reducing the number of R-rated movies viewed and that these restrictions are associated with a reduced risk of smoking and drinking alcohol.
 - b. Teach parents how to effectively restrict their children’s behavior.
 - c. Classify movies that depict smoking and drinking alcohol as R-rated. (The question asks for public health strategies for limiting exposure to R-rated movies, so classifying a movie as R-rated would not necessarily limit the exposure of R-rated movies; it would merely increase the number of R-rated movies.)
 - d. Get movie directors to reduce the amount of smoking and drinking depicted in their movies.
 - e. Make students aware that viewing R-rated movies is associated with smoking and alcohol drinking and discuss why this is so.
 - f. Enforce existing regulations restricting the viewing R-rated movies.
 - g. Promote devices on TV that “lock out” certain channels.
 - h. Promote purchasing “clean” versions of movies (cleanflicks.com).
 - i. Promote locks for VCR / DVD players.
 - j. Enforce rules for not allowing people under the age of 18 to purchase movies that are R-rated.