Probability Topics: Practice*

Susan Dean
Barbara Illowsky, Ph.D.

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Abstract

This module provides the opportunity for students to apply what they've learned about probability to solve a series of problems given a set of data. Students will practice constructing and interpreting contingency tables.

1 Student Learning Outcomes

- The student will construct and interpret contingency tables.

2 Given

An article in the *New England Journal of Medicine* , reported about a study of smokers in California and Hawaii. In one part of the report, the self-reported ethnicity and smoking levels per day were given. Of the people smoking at most 10 cigarettes per day, there were 9886 African Americans, 2745 Native Hawaiians, 12,831 Latinos, 8378 Japanese Americans, and 7650 Whites. Of the people smoking 11-20 cigarettes per day, there were 6514 African Americans, 3062 Native Hawaiians, 4932 Latinos, 10,680 Japanese Americans, and 9877 Whites. Of the people smoking 21-30 cigarettes per day, there were 1671 African Americans, 1419 Native Hawaiians, 1406 Latinos, 4715 Japanese Americans, and 6062 Whites. Of the people smoking at least 31 cigarettes per day, there were 759 African Americans, 788 Native Hawaiians, 800 Latinos, 2305 Japanese Americans, and 3970 Whites. (*(Source: http://www.nejm.org/doi/full/10.1056/NEJMoa033250)*)

3 Complete the Table

Complete the table below using the data provided.

Smoking Levels by Ethnicity

Smoking Level	African American	Native Hawaiian	Latino	Japanese Americans	White	TOTALS
continued on next page						

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1-10						
11-20						
21-30						
31+						
TOTALS						

Table 1

4 Analyze the Data

Suppose that one person from the study is randomly selected.

Exercise 1 ***(Solution on p. 3.)***

Find the probability that person smoked 11-20 cigarettes per day.

Exercise 2 ***(Solution on p. 3.)***

Find the probability that person was Latino.

5 Discussion Questions

Exercise 3 ***(Solution on p. 3.)***

In words, explain what it means to pick one person from the study and that person is "Japanese American **AND** smokes 21-30 cigarettes per day." Also, find the probability.

Exercise 4 ***(Solution on p. 3.)***

In words, explain what it means to pick one person from the study and that person is "Japanese American **OR** smokes 21-30 cigarettes per day." Also, find the probability.

Exercise 5 ***(Solution on p. 3.)***

In words, explain what it means to pick one person from the study and that person is "Japanese American **GIVEN** that person smokes 21-30 cigarettes per day." Also, find the probability.

Exercise 6

Prove that smoking level/day and ethnicity are dependent events.

Solutions to Exercises in this Module

Solution to Exercise (p. 2)

$\frac{35,065}{100,450}$

Solution to Exercise (p. 2)

$\frac{19,969}{100,450}$

Solution to Exercise (p. 2)

$\frac{4,715}{100,450}$

Solution to Exercise (p. 2)

$\frac{36,636}{100,450}$

Solution to Exercise (p. 2)

$\frac{4715}{15,273}$