



Bookmarks

- ▶ Important Pre-Course Survey
- ▶ Contact Us
- ▶ How To Navigate the Course
- ▶ Discussion Board
- ▶ Office Hours
- ▶ Week 1: Introduction to Data
- ▶ Week 2: Univariate Descriptive Statistics
- ▶ Week 3: Bivariate Distributions
- ▼ **Week 4: Bivariate Distributions (Categorical Data)**

Readings

Reading Check due
Mar 15, 2016 at 18:00
UTC

Lecture Videos

Comprehension Check
due Mar 15, 2016 at
18:00 UTC

Week 4: Bivariate Distributions (Categorical Data) > Lecture Videos > Independence & Conditional Probability



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Independence & Conditional Probability



SPEAKER: MICHAEL J.
MAHOMETA, Ph.D.

We know that using a contingency table is the first step in determining if there is a relationship between two categorical variables.

And then, that the Row or Column percentages

▶ 0:00 / 6:20

▶ 1.0x



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Comprehension Check


Below is a contingency table showing data from a University of Texas Southwestern Medical Center study on Hepatitis C.

	Tattoo in Commercial Parlor	Tattoo Done Elsewhere	No Tattoo	Total
Has Hepatitis C	17	8	18	43
Does Not Have	35	53	495	58


R Tutorial Videos**Pre-Lab**

Pre-Lab due Mar 15,
2016 at 18:00 UTC 

Lab

Lab due Mar 15, 2016
at 18:00 UTC 

Problem Set

Problem Set due Mar
15, 2016 at 18:00 UTC 

► **Week 5: Linear
Functions**

Hepatitis C

				3
Total	52	61	513	626

(6/6 points)

1) How many simple events (outcomes) were possible for participants in this study?

☐ Three

☒ Six 


☐ Nine

☐ Twelve

2) What was the total number of participants in this study?

☐ 513

☐ 583

☒ 626 


☐ 1113

3) What was the marginal distribution for Hepatitis status in this study?

☐ 25 had tattoos, and 18 did not.

☐ 626 participants had Hepatitis.

☐ Of the 513 participants with no tattoo, most did not have hepatitis.

☒ 43 had Hepatitis; 583 did not have Hepatitis. 

4) Overall, what percentage of participants had a tattoo? (*Round to 1 decimal place and do not include % sign.*)

✓ Answer: 18.1

18.1

5) What percentage of those participants with Hepatitis C had a tattoo done in a commercial parlor? (*Round to 1 decimal and do not include % sign.*)

✓ Answer: 39.5

39.5

6) What percentage of those who had a tattoo done in a commercial parlor have Hepatitis C? (*Round to 1 decimal and do not include % sign.*)

✓ Answer: 32.7

32.7

Calculate the probability that a randomly selected participant from the study would have Hepatitis C:

$$P(\text{Hepatitis}) = \frac{\text{outcomes with Hepatitis}}{\text{total outcomes in sample space}} = \frac{A}{B} = C$$

(4/4 points)

7) What is the value of **A**?

✓ Answer: 43

43

8) What is the value of **B**?

✓ Answer: 626

626

9) What is the value of **C**, the probability of randomly selecting a participant with Hepatitis? (*Round to 3 decimal places.*)

✓ Answer: 0.069

10) In general, what must be true of $P(A)$?

- ☒ It must be between the values of 0 and 1, inclusive. ✓
- ☐ It must be calculated from real data; it cannot be determined theoretically.
- ☐ It must include all possible outcomes of an experiment.
- ☐ It must not be greater than $P(B)$.

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