

Constructing Contingency (Cross-Tabulation) Tables, Exercises

1. The Lebanon postmaster suspects that working on ziptronic machines is the cause of high absenteeism. More than 10 absences from work without business-related reasons is considered excessive absenteeism. A check of employee records shows that 26 of the 44 ziptronic operators had 10 or more absences and 35 of 120 non-ziptronic workers had 10 or more absences. Construct a contingency table for the postmaster. Does the table support the postmaster's suspicion that working on ziptronic machines is related to high absenteeism?

2. The Egyptian Air Force brass believe that overweight pilots have slow reaction times. They attribute the poor performance of their air force in recent war games in the Sinai to overweight pilots. The accompanying data were collected for all pilots. Analyze these data for the Egyptian Air Force.

Reaction Time	Pilot Weight		
	Normal	Up to 10 Pounds Overweight	More than 10 Pounds Overweight
Poor	14	36	45
Adequate	35	40	33
Excellent	46	25	15

3. The state personnel office oversees the state's tuition assistance program, which pays the tuition of civil servants taking courses for an MPA. Only two schools offer an MPA degree in the state capital, Capital College of Law and East Winslow State University. Some concern is expressed by legislators that many tuition-assisted students do not graduate. Analyze the data in the accompanying table for the personnel office.

Status	Students Assisted for MPA Tuition	
	Capital	East Winslow
Did not graduate	69	83
Graduated	23	37

4. As head scheduler of special events for the Incomparable Myriad (the city arena), your task is to schedule events that make a profit so that the city need not subsidize the arena. Analyze the data in the accompanying table, which is based on last year's data, and report to the city council.

Status	Type of Event				
	Hockey Games	Religious Rallies	Basketball Games	Rock Concerts	Public Administration Conventions
Not Profitable	24	4	21	2	3
Profitable	18	32	6	8	0

5. The Cancer Institute is evaluating an experimental drug for controlling lip cancer. Eighty lip cancer victims are randomly selected and given the drug for 1 year. Sixty other lip cancer victims are randomly selected and given a placebo for a year. From the data in the accompanying table, what would you conclude?

Cancer Status	Drug Group	Placebo Group
Active	58	42
Remission	22	18

6. A professor of public administration has kept records on the class participation of his students over the past several years. He has a strong feeling (hypothesis) that class participation is related to grade in the course. For this analysis he classifies course grades into two categories, fail and pass. He operationalizes class participation as “low” if the student participated in class discussion in fewer than 25% of class periods, and “high” if the student participated in 25% or more of the periods. Based on these definitions, he has assembled the cross-tabulation below. Does a relationship exist between class participation and course grades?

Grade in Course	Class Participation	
	Low	High
Fail	56	15
Pass	178	107

7. Madonna Lewis’s job in the Department of Sanitary Engineering is to determine whether new refuse collection procedures have improved the public’s perception of the department. Public opinion surveys were taken both before and after the new procedures were implemented. The results appear in the accompanying table. Analyze the table, and evaluate whether public perception of the department appears to have improved over time.

Opinion	Before	After
Department is doing a poor job	79	73
Department is doing a good job	23	47

Question 1

Cross-tabulation (frequencies)

Number of Absences	Work on Ziptronic?	
	No	Yes
Less than 10	85	18
10 or more	35	26
Total	120	44

Cross-tabulation (percentaged)

Number of Absences	Work on Ziptronic?	
	No	Yes
Less than 10	71%	41%
10 or more	29%	59%
	(n = 120) 100%	(n = 44) 100%

Conclusion: Hypothesis is supported. Employees who operate the ziptronic are more likely to have 10 or more absences than those who do not by 30%

Question 2

Cross-tabulation (percentaged)

Reaction Time	Pilot Weight		
	Normal	Up to 10 lbs Overweight	More than 10 lbs Overweight
Poor	15%	36%	48%
Adequate	37%	40%	36%
Excellent	48%	25%	16%
	(n = 95) 100%	(n = 101) 101%	(n = 93) 100%

Conclusion: Egyptian Air Force brass is correct. Overweight pilots are more likely to have poor reaction time than normal-weight pilots by 33% (48% - 33%). Also, overweight pilots are less likely to have excellent reaction time than normal-weight pilots by 32% (48% - 16%). Reaction time is affected by 32% - 33% by being overweight.

Question 3

Cross-tabulation (percentaged)

Status	Students Assisted for MPA Tuition	
	Capital	East Winslow
Did not graduate	75%	69%
Graduated	25%	31%
	(n = 92) 100%	(n = 120) 100%

Conclusion: Legislators have reason for concern. Most tuition-assisted students do not graduate. East Winslow does slightly better than Capital in graduation rate (by 6%), but 72% of these students do not graduate.

Question 4

Cross-tabulation (percentaged)

Status	Type of Event				
	Hockey Games	Religious Rallies	Basketball Games	Rock Concerts	Public Administration Conventions
Not Profitable	57%	11%	78%	20%	100%
Profitable	43%	89%	22%	80%	0%
	(n = 42) 100%	(n = 36) 100%	(n = 27) 100%	(n = 10) 100%	(n = 3) 100%

Conclusion: Religious rallies rank highest with respect to the rate of profitable events (89%), followed closely by rock concerts (80%). The other three are all unprofitable, with PA ranking dead last.

Question 5

Cross-tabulation (percentaged)

	Group	
Cancer Status	<i>Drug Group</i>	<i>Placebo Group</i>
<i>Active</i>	72%	70%
<i>Remission</i>	28%	30%
	(n = 80) 100%	(n = 60) 100%

Conclusion: Virtually no difference between drug group and placebo group in achieving remission. The drug does not appear to be effective.

Question 6

Cross-tabulation (percentaged)

	Class Participation	
Grade in Course	<i>Low</i>	<i>High</i>
<i>Fail</i>	24%	12%
<i>Pass</i>	76%	88%
	(n = 234) 100%	(n = 122) 100%

Conclusion: Professor's hypothesis is supported. Students who had a high rate of class participation were more likely to pass the course than students with a low rate of participation by 12%.

Question 7

Cross-tabulation (percentaged)

	Survey	
Opinion	<i>Before</i>	<i>After</i>
<i>Department is doing a poor job</i>	77%	61%
<i>Department is doing a good job</i>	23%	39%
	(n = 102) 100%	(n = 120) 100%

Conclusion: New refuse collection procedures appear to have improved the public's perception of Department of Sanitary Engineering by 16%.