

Friday May 8

(4) EEE | (3) EEP | (2) P P P
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Unit 4 conditional, Independent, binomial, Probability from Tables

A medical researcher surveyed a large group of men and women about whether they take medicine as prescribed. The responses were categorized as never, sometimes, or always. The relative frequency of each category is shown in the table.

	Never	Sometimes	Always	Total
Men	0.0564	0.2016	0.2120	0.4700
Women	0.0636	0.1384	0.3280	0.5300
Total	0.1200	0.3400	0.5400	1.0000

(a) One person from those surveyed will be selected at random.

- (i) What is the probability that the person selected will be someone whose response is never and who is a woman?

(1) $P(\text{never and woman}) = .0636$

- (ii) What is the probability that the person selected will be someone whose response is never or who is a woman?

(2) $P(\text{never or woman}) = .1200 + .5300 - .0636 = .5864$

- (iii) What is the probability that the person selected will be someone whose response is never given that the person is a woman?

(3) $P(\text{never} | \text{woman}) = \frac{P(\text{never and woman})}{P(\text{woman})} = \frac{.0636}{.53} = .12$

(b) For the people surveyed, are the events of being a person whose response is never and being a woman independent? Justify your answer.

(1) $P(\text{never}) \cdot P(\text{woman}) \stackrel{?}{=} P(\text{never and woman})$
 (2) $(.12) (.53) \stackrel{?}{=} .0636$
 $.0636 = .0636 \therefore \text{events are independent.}$ (3)

(c) Assume that, in a large population, the probability that a person will always take medicine as prescribed is 0.54. If 5 people are selected at random from the population, what is the probability that at least 4 of the people selected will always take medicine as prescribed? Support your answer.

0 1 2 3 4 5 (2) define bounds

$1 - \text{binomcdf}(5, .54, 3) = .2415$ (3) correct answer
 n P X
 1
 define n and p for binomial setting

EPI

EPI

EPI