Current Score

QUESTION	1	2	3	4
POINTS	4.5/4.5 ✓	2/2 ✓	3/3 ✓	5.5/5.5 ✓

TOTAL SCORE

15/15 **100.0%**

Due Date

MON, NOV 20, 2023
11:59 PM GMT+3

Request Extension

Assignment Submission & Scoring

Assignment Submission

For this assignment, you submit answers by questions.

Assignment Scoring

Your best submission for each entire question is used for your score.

Suppose we are conducting a hypertension-screening program in the home. Consider all possible pairs of DBP measurements of the mother and father within a given mixed gender family, assuming that the mother and father are not genetically related. In particular, we might be interested in whether the mother or father is hypertensive, which is described, respectively, by events A = {mother's DBP ≥ 90}, B = {father's DBP ≥ 90}. Suppose we know that $Pr(A) = 0.11$, $Pr(B) = 0.21$. Let X be the random variable representing the number of hypertensive adults in a given mixed gender family.

(a) Derive the probability-mass function for X.

x	$Pr(X = x)$
0	0.7031 ✓
1	0.2738 ✓
2	0.0231 ✓

(b) What is its expected value?

0.32 ✓

(c) What is its variance?

0.2638 ✓

(d) What is its cumulative-distribution function?

x	$F(x)$
$x < 0$	✗
$0 \le x < 1$	✗
$1 \le x < 2$	✗
$x \ge 2$	✗

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Suppose 8 of 20 students in a grade-school class develop influenza, whereas 20% of grade-school students nationwide develop influenza.

USE SALT

(a) Is there evidence of an excessive number of cases in the class? That is, what is the probability of obtaining at least 8 cases in this class if the nationwide rate holds true? (Round your answer to four decimal places.)

0.0321 ✓

(b) What is the expected number of students in the class who will develop influenza?

4 ✓

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3. [3/3 Points] DETAILS PREVIOUS ANSWERS

ROSBIOSTAT8 4.E.030-032.S. 1/3 Submissions Used

MY NOTES ASK YOUR TEACHER PRACTICE ANOTHER

Hypertension

A national study found that treating people appropriately for high blood pressure reduced their overall mortality by 20%. Treating people adequately for hypertension has been difficult because it is estimated that 50% of hypertensives do not know they have high blood pressure, 50% of those who do know are inadequately treated by their physicians, and 50% who are appropriately treated fail to follow this treatment by taking the right number of pills.

USE SALT

(a) What is the probability that among 10 true hypertensives at least 50% are being treated appropriately and are complying with this treatment? (Round your answer to four decimal places.)

0.0045 ✓

(b) What is the probability that at least 8 of the 10 hypertensives know they have high blood pressure? (Round your answer to four decimal places.)

0.0547 ✓

(c) If the preceding 50% rates were each reduced to 35% by a massive education program, then what effect would this change have on the overall mortality rate among true hypertensives; that is, would the mortality rate decrease and, if so, what percentage of deaths among hypertensives could be prevented by the education program? (Round your answer to two decimal places.)

The overall mortality rate among hypertensives would be reduced by ______ ✗ %.

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Renal Disease

The presence of bacteria in a urine sample (bacteriuria) is sometimes associated with symptoms of kidney disease in women. Suppose a determination of bacteriuria has been made over a large population of women at one point in time and 6% of those sampled are positive for bacteriuria. (Round your answers to four decimal places.)

USE SALT

(a) If a sample size of 5 is selected from this population, what is the probability that 1 or more women are positive for bacteriuria?

0.2661 ✓

(b) Suppose 100 women from this population are sampled. What is the probability that 3 or more of them are positive for bacteriuria?

0.9434 ✓

One interesting phenomenon of bacteriuria is that there is a "turnover"; that is, if bacteriuria is measured on the same woman at two different points in time, the results are not necessarily the same. Assume that 20% of all women who are bacteriuric at time 0 are again bacteriuric at time 1 (1 year later), whereas only 5.1% of women who were not bacteriuric at time 0 are bacteriuric at time 1. Let *X* be the random variable representing the number of bacteriuric events over the two time periods for 1 woman and still assume that the probability that a woman will be positive for bacteriuria at any one exam is 6%.

(c) What is the probability distribution of *X*?

x	0	1	2
***P*(*X*)**	0.89206 ✓	0.09594 ✓	0.012 ✓

(d) What is the mean of *X*?

0.1199 ✓

(e) What is the variance of *X*?

0.1296 ✓

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