

Homework 2

Part 1 of 1 -

Question 1 of 17

2.0 Points

Questions 1-9 are given in the attached file. What is the correct answer to question 1?

 [fluquestion.pdf](#) 52 KB

- ☐ A. The wicked stepmother has influenza
- ☒ B. The mother, the father, or both have influenza
- ☐ C. None of the above
- ☐ D. The mother has influenza and the father may or may not have influenza
- ☐ E. The mother and father have influenza

[Reset Selection](#)

Question 2 of 17

2.0 Points

Questions 1-9 are given in the attached file. What is the correct answer to question 2?

 [fluquestion.pdf](#) 52 KB

- ☒ A. Both the mother and the father have influenza.
- ☐ B. None of the above
- ☐ C. Neither the mother nor the father has influenza
- ☐ D. Everyone has died in a massive influenza epidemic
- ☐ E. The mother has influenza, and the father may or may not have influenza

[Reset Selection](#)

Question 3 of 17

2.0 Points

Questions 1-9 are given in the attached file. What is the correct answer to question 3?

 [fluquestion.pdf](#) 52 KB

- ☐ A. There is not enough information provided to answer this question.
- ☐ B. Yes
- ☒ C. No

[Reset Selection](#)

Question 4 of 17

2.0 Points

Questions 1-9 are given in the attached file. What is

the correct answer to question 4?

 [fluquestion.pdf](#) 52 KB

- ☐ A. Somebody should have gotten a flu shot!
- ☐ B. None of the above
- ☐ C. The first child has influenza, and the second child does not.
- ☐ D. The first child has influenza, and the second child may or may not have influenza
- ☒ E. At least one child has influenza

Reset Selection

Question 5 of 17

2.0 Points

Questions 1-9 are given in the attached file. What is the correct answer to question 5?

 [fluquestion.pdf](#) 52 KB

- ☐ A. None of the above
- ☐ B. The first child has influenza, and the second child does not.
- ☒ C. The first child has influenza, and the second child may or may not have influenza.
- ☐ D. Both children have influenza.

Reset Selection

Question 6 of 17

2.0 Points

Questions 1-9 are given in the attached file. What is the correct answer to question 6?

 [fluquestion.pdf](#) 52 KB

- ☒ A. The mother does not have influenza
- ☐ B. None of the above
- ☐ C. The mother has influenza
- ☐ D. Someone else besides the mother has influenza, and she might or might not have influenza.

Reset Selection

Question 7 of 17

2.0 Points

Questions 1-9 are given in the attached file. What is the correct answer to question 7?

 [fluquestion.pdf](#) 52 KB

- ☐ A. I don't know, I'm feeling sick.
- ☒ B. No one in the immediate family has influenza!
- ☐ C. None of the above
- ☐ D. Everyone in the family has influenza

Reset Selection

Question 8 of 17

2.0 Points

Questions 1-9 are given in the attached file. What is the correct answer to question 8?

 [fluquestion.pdf](#) 52 KB

- ☒ A. At least one family member has influenza
- ☐ B. No family member has influenza
- ☐ C. None of the above
- ☐ D. All family members have influenza

Reset Selection

Question 9 of 17

2.0 Points

Questions 1-9 are given in the attached file. What is the correct answer to question 9?

 [fluquestion.pdf](#) 52 KB

- ☐ A. Exactly one parent and one child have influenza
- ☒ B. None of the above
- ☐ C. No one in the family has influenza
- ☐ D. At least one family member has influenza

Reset Selection

Question 10 of 17

15.0 Points

According to an NIH-sponsored study, condom failure rates (e.g., breakage, slippage) during intercourse range from 0.4-2.3%. Suppose that the failure rate of Brand X is 2%. A Brand X Pleasure Pack contains 12 condoms. The probability that at least one of the condoms in the pack will fail during intercourse is 0.215.

$$\begin{aligned} & \Pr(\text{at least 1 fails}) \\ &= 1 - \Pr(0 \text{ fail}) \\ &= 1 - \binom{12}{0} (0.02)^0 (0.98)^{12-0} \\ &= 1 - 0.785 = 0.215 \end{aligned}$$

Question 11 of 17

10.0 Points

A suicide prevention website reports that 87% of all suicides are committed by males, 56% of all suicides are committed using a gun, and 10% of all suicides are committed by women not using a gun. Let M be the event a suicide is committed by a male and F be the event that a suicide is committed by a female. In addition, let G be the event that a suicide is committed using a gun. Which of the attached four probability tables is a correct representation of the information provided?

 [suicidetable.pdf](#) 281 KB

- ☐ A. Table A
- ☒ B. Table B
- ☐ C. Table C

Consider a hypothetical 1000 table.

☐ D. Table D

☐ E. None of the above

Reset Selection

	Gun	No Gun	
♂	530	340	870
♀	30	100	130
	560	440	1000

Question 12 of 17

10.0 Points

A suicide prevention website reports that 87% of all suicides are committed by males, 56% of all suicides are committed using a gun, and 10% of all suicides are committed by women not using a gun. Given that a gun is used for a suicide,

0.054 is the conditional probability that the victim is female.

Question 13 of 17

8.0 Points

 [cmmstable.pdf](#) 45 KB

The Chinese Mini-Mental Status Test (CMMS) consists of 114 items intended to identify people with Alzheimer's disease and senile dementia among people in China. An extensive clinical evaluation of this instrument was performed, in which participants took the CMMS and then were interviewed by psychiatrists and nurses, after which a definitive diagnosis of dementia was made. Results obtained for a subgroup of participants with formal education are presented in the attached table.

	Definitive		
	Demented	Not	Total
CMMS demented	12	12	24
CMMS not	4	34	38
Total	16	46	62

Suppose that a score of 20 or below on the CMMS is used to identify people as demented, and those scoring above 20 are classified by the CMMS as not demented.

$$Pr(T+|D+) = \frac{12}{16} = 75\%$$

What is the sensitivity of the CMMS test? The CMMS test has sensitivity 75 %.

Question 14 of 17

8.0 Points

 [cmmstable.pdf](#) 45 KB

The Chinese Mini-Mental Status Test (CMMS) consists of 114 items intended to identify people with Alzheimer's disease and senile dementia among people in China. An extensive clinical evaluation of this instrument was performed, in which participants took the CMMS and then were interviewed by psychiatrists and nurses, after which a definitive diagnosis of dementia was made. Results obtained for a subgroup of participants with formal education are presented in the attached table.

$$Pr(T-|D-) = \frac{34}{46} = 73.9\%$$

Suppose that a score of 20 or below on the CMMS is used to identify people as demented, and those scoring above 20 are classified by the CMMS as not demented.

What is the specificity of the CMMS? The

specificity of the CMMS is 73.9 %.

Question 15 of 17

8.0 Points

 [cmmstable.pdf](#) 45 KB

The Chinese Mini-Mental Status Test (CMMS) consists of 114 items intended to identify people with Alzheimer's disease and senile dementia among people in China. An extensive clinical evaluation of this instrument was performed, in which participants took the CMMS and then were interviewed by psychiatrists and nurses, after which a definitive diagnosis of dementia was made. Results obtained for a subgroup of participants with formal education are presented in the attached table.

$$Pr(D+|T+) = \frac{12}{24} = 50\%$$

Suppose that a score of 20 or below on the CMMS is used to identify people as demented, and those scoring above 20 are classified by the CMMS as not demented.

The positive predictive value of the CMMS is

50 %.

Question 16 of 17

8.0 Points

The Chinese Mini-Mental Status Test (CMMS) consists of 114 items intended to identify people with Alzheimer's disease and senile dementia among people in China. An extensive clinical evaluation of this instrument was performed, in which participants took the CMMS and then were interviewed by psychiatrists and nurses, after which a definitive diagnosis of dementia was made. Results obtained for a subgroup of participants with formal education are presented in the attached table.

$$Pr(D-|T-) = \frac{34}{38} = 89.5\%$$

Suppose that a score of 20 or below on the CMMS is used to identify people as demented, and those scoring above 20 are classified by the CMMS as not demented.

Suppose that your parent is Chinese with a formal education and scores >20 on the CMMS. What is the probability that your parent is truly not demented?

 [cmmstable.pdf](#) 45 KB

☒ A. >85%

☐ B. <50%

☐ C. Are you kidding? My parents are definitely demented.

☐ D. 50-85%

Hmm, tempting!

Reset Selection

Question 17 of 17

15.0 Points

A group of 100 women aged 60-64 get a new influenza vaccine, and 5 of these women die within a year. You need to determine whether this event is unusual enough to worry about vaccine safety, or whether this is consistent with the expected mortality rate in this gender-age group.

Suppose that 0.9% of women in this age group would die in a one-year period. What is the probability that 5 or more women out of a group of 100 would die in a one year period?

The probability is .

$$1 - \Pr(0 \text{ die}) - \Pr(1 \text{ dies}) - \Pr(2 \text{ die}) \\ - \Pr(3 \text{ die}) - \Pr(4 \text{ die})$$

$$= 1 - \binom{100}{0} (.009)^0 (1-.009)^{100} - \binom{100}{1} (.009)^1 (1-.009)^{99} \\ - \binom{100}{2} (.009)^2 (1-.009)^{98} - \binom{100}{3} (.009)^3 (1-.009)^{97} \\ - \binom{100}{4} (.009)^4 (1-.009)^{96}$$

Assessment Preview - This is an example student view of this assessment

$$= 0.002$$