



Biostatistics

Archive

Lecture 14 part 2

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1. One statement is INCORRECT for the assumption of t test:

- A. Normal distribution of the population of the sample
- B. Randomization of the sample
- C. The data are categorical
- D. Dependency of the sample
- E. The data are continuous

Answer: C. the data are categorical

2. If we want to know whether Indian women are taller than Jordanian women according to the height (cm) and we know the following information for Indian women: sample size =60, mean

height=180 cm, standard deviation =5 and for Jordanian women: sample size=50; mean height 170 cm, standard deviation= 3

(Assuming that level of significance or $\alpha=0.05$, and two-sided test). The calculated value will be:

- A. 10.5
- B. 6.3
- C. 3.8
- D. 7.2
- E. 12.4

Answer: E. 12.4

3. Assuming that level of significance or $\alpha=0.05$, and two-sided test The Calculated Value (t)

= 1.78, and the sample size (n) = 78. We conclude that:

- A. $P<0.001$
- B. $P= 0.010$
- C. $P<0.05$ and >0.010
- D. $P<0.05$ and >0.020
- E. $P<0.100$ and >0.050

Answer: E. $P<0.100$ and >0.050

4. If it is known that the mean blood sugar of adults in Jordan is: 120 mmol/l and we want to test whether mean blood sugar of adults in Al- Karak governorate is the same or different from the Jordanian population. The sample size = 81 adults, their arithmetic mean of blood sugar= 124 mmol/l and standard deviation=18. (Assuming that level of significance or $\alpha=0.05$, and two sided test). The Calculated Value(t) will be:

- A. 1.55
- B. 2.00
- C. 3.22
- D. 2.50
- E. 4.15

Answer: B. 2.00

5. In two tailed t- test at $\alpha = 0.01$ and total subjects = 29. The critical t value is:

- A. 2.76
- B. 2.46
- C. 1.3
- D. 1.96

Answer: A. 2.76

6. A first-year medical student, student was given the following information: mean of the sample= 85, mean of the population = 90, SD= 4.14, sample size = 31 and $\alpha=0.05$. The degree of freedom they must use will be:

- A. 30
- B. 31
- C. 32
- D. 5.57

Answer: A. 30

7. A first-year medical student, student was given the following information: mean of the sample = 85, mean of the population = 90, SD = 4.14, sample size = 31 and $\alpha = 0.05$. The critical value of the statistical test of choice will be:

- A. 2.04
- B. 1.7
- C. 6.72
- D. 1.13
- E. 6.62

Answer: A. 2.04

8. A first-year medical student, student was given the following information: mean of the sample = 85, mean of the population = 90, SD = 4.14, sample size = 31 and $\alpha = 0.05$. The calculated value of the statistical test of choice will be:

- a. 2.04
- b. 1.7
- c. 6.72
- d. 1.13
- e. 6.62

Answer: c. 6.72

9. The temperature of 10 subjects suffering from tonsillitis before (40, 40, 37, 38, 39, 39, 38, 38, 39, 38) and after 4 hours of Panadol therapy became (37, 38, 38, 38, 37, 37, 38, 38, 37, 37),

Respectively (Assuming that level of significance or $\alpha = 0.05$, and two-sided test) The Calculated value (t) is:

- A. 5.1 B. 2.1
- C. 3.2 D. 6.6
- E. 2.7

Answer: E. 2.7

10. In two tailed t- test at $\alpha = 0.001$, and total subjects = 29. The critical t value is:

- A. 2.76
- B. 1.70
- C. 3.68
- D. 2.48
- E. 1.96

Answer: c. 3.68

11. One statement is incorrect to assume in one sample t- test:

- A. Normal distribution of the population of the chosen sample
- B. Independency of the sample
- C. Randomization of the sample
- D. Dependency of the sample
- E. None of the above

Answer: D. dependency of the sample

12. You would like to see whether your colleagues' weights differ from general population. The colleagues' weights are normally distributed; the average population weight is 70 kg. The sample size=100, the sample mean= 75:20. (2- sided, Set $\alpha = 0.05$). So, the calculated value of t test is:

- A. 1.40
- B. 0.15
- C. 3.05
- D. 2.75
- E. 2.50

Answer: E. 2.50

13. You would like to see whether your colleagues' weights differ from general population. The colleagues' weights are normally distributed; the average population weight is 70 kgs. The sample size=100, the sample mean= 75:20 kgs. (2-sided, Set alpha=0.05). So, the decision to be taken according to your calculated value of t test is:

- A. Accept the null hypothesis
- B. Reject the alternative hypothesis
- C. Fail to reject the null hypothesis
- D. Accept the alternative hypothesis
- E. Cannot be determined and more information are needed.

Answer: D. Accept the alternative hypothesis

14. The critical value for two tailed t- test at alpha= 0.001, and the total subjects in the study= 13, is:

- A. 4.22
- B. 3.85
- C. 2.65
- D. 4.32
- E. 3.93

Answer: D. 4.32

15. The critical value for two tailed t- test at alpha= 0.001, and the total subjects in the study= 13, is:

- a. 4.22
- b. 3.85
- c. 2.65
- d. 4.32
- e. 3.93

Answer: d. 4.32

16. In an attempt to find newer advancements in the area of HIV management, a new antiretroviral therapy (HAART) was administered to patients for 12 months then discharged. The baseline results of their immune cell counts (CD4+ T cells) as well as the-end-of-the-treatment counts were both recorded. To study the feasibility of this HAART therapy, a statistical test with a level of confidence equals 95% was used. The degree of freedom of this test will be:

- a. 6
- b. 12
- c. 14
- d. 6,2094

	1	2	3	4	5	6	7	Sum
CD4+ T cells count upon entry	173	58	103	181	105	301	169	1090
CD4+ T cells count upon follow-up	257	108	315	362	141	549	369	2101

Answer: a. 6

17. In an attempt to find newer advancements in the area of HIV management, a new antiretroviral therapy (HAART) was administered to patients for 12 months then discharged. The baseline results of their immune cell counts (CD4+ T cells) as well as the-end-of-the-treatment counts were both recorded. To study the feasibility of this HAART therapy, a statistical test with a level of confidence equals 95% was used. The calculated value of this test will be:

	1	2	3	4	5	6	7	Sum
CD4+ T cells count upon entry	173	58	103	181	105	301	169	1090
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	1	2	3	4	5	6	7	Sum
CD4+T cells Count upon entry	173	58	103	181	105	301	169	1090
CD4 +T cells Count upon follow up	257	108	315	362	141	549	369	2102
difference	84	50	212	181	36	248	200	1011
(difference) ²	7056	2500	44944	32761	1296	61504	40000	190061

$$\Rightarrow \sum x_i^2 = 1022121$$

$$\Rightarrow \sum x_i = 190061$$

$$\bar{x}_0 = \frac{\text{difference}}{N} = \frac{1011}{7} = 144.43$$

$$SD = \sqrt{\frac{\sum x_i^2 - \frac{(\sum x_i)^2}{N}}{N-1}} = \sqrt{\frac{190061 - \frac{1022121}{7}}{6}} = \sqrt{7340.6} = 85.68$$

$$t = \frac{\bar{x}_0}{S_0/\sqrt{n}} = \frac{144.43}{85.65/\sqrt{7}} = 4.459$$

So the calculated t is equal to 4.459

18. In an attempt to find newer advancements in the area of HIV management, a new antiretroviral therapy (HAART) was administered to patients for 12 months then discharged. The baseline results of their immune cell counts (CD4+ T cells) as well as the end-of-the-treatment counts were both recorded. To study the feasibility of this HAART therapy, a statistical test with a level of confidence equals 95% was used. Assuming that the critical value of this test was 2.4, your statistical decision will be except:
- A. reject the null hypothesis
 - B. accept the alternative hypothesis
 - C. $P < 0.05$
 - D. There is an increase in chance factor

Answer: D. There is an increase in chance factor