Completely Randomized Design For Hepatitis

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Abstract

In this study, Hepatitis data in health center in Najaf was introduced. Completely Randomized Design and least significant difference are used to analyzed the data to get the significant difference effect between all variables. In the results. There exist no significant deference between level of tumor .

key words: Completely randomized design, Lest significant difference, Hepatitis

1.Introduction

Linear multiple regression analysis extends simple linear regression analysis by considering two or more independent variables. In the case of three independent variables, denoted as

We taken 900 case from Al-Sader medical city in Al-Najaf in Iraq for the period 2005-2009. This data contain breast cancer divided between Levels of Tumor, Occupation, Marital Status and Education. The main aim of this study presentation and description all cases of breast cancer and find the significant difference between all years and groups depend on all variables levels of tumor, occupation, marital status and education using SPSS program to get regression models summary, analysis of variance for all variables, and regression coefficients.

2.Materials and Methods

2.1 The Completely Randomized Design CRD

The completely randomized design CDR refers to the random assignment of experimental units to a set of treatments.

It is essential to have more than one experimental unit per treatment to estimate the magnitude of experimental error and to make probability statements concerning treatment effects.

ANOVA table for CRD with equal replication

S.O.V	df	SS	MS	F cal.	F tab.
Treatment	t-1	$\dfrac{\sum Y_i{}^2}{r} - cf$	$\dfrac{SST}{t-1}$	$\dfrac{MST}{MSE}$	dft , df E
Error	t(r-1)	SST-SSt	$\dfrac{SSE}{t(r-1)}$		
Total	tr-1	$\sum Y_i{}^2 - cf$			

Where S.O.V= source of variation , df= degree of freedom, ss= sum of squares, MS= mean square

2.2 Lest Significant Difference LSD

When you run an ANOVA (analysis of variance) test and get a significant results , that means at least one of the groups tested differs from the other groups. However, you tell from the ANOVA test which group differs. In order to address this, Fisher developed the least significant difference test in 1935 , which is only used when you reject the null hypothesis as a results of your hypothesis test results.

Least Significant Difference LSD : Formula

The formula for the least significant difference is:

$$LSD = t \cdot S_{\bar{y}}$$

Where

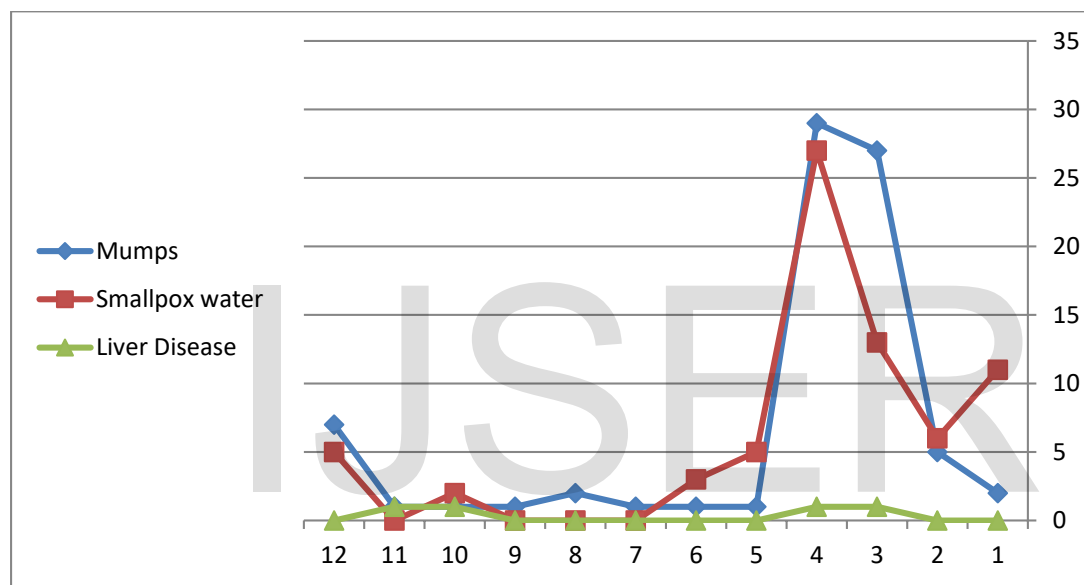$$t = \frac{(\bar{Y}_1 - \bar{Y}_2)}{S_{\bar{y}}}$$

$$S_{\bar{y}} = \sqrt{\frac{S_1{}^2}{r_1} + \frac{S_2{}^2}{r_2}}$$

$$S_{\bar{y}} = \sqrt{\frac{2S^2}{r}}$$

3. Results

Table 1. Levels of Tumor distributed in the three levels

Months	1	2	3	4	5	6	7	8	9	10	11	12
Mumps	2	5	27	29	1	1	1	2	1	1	1	7
Smallpox water	11	6	13	27	5	3	0	0	0	2	0	5
Liver Disease	0	0	1	1	0	0	0	0	0	1	1	0

Figure 1: Levels of Tumor

Df_t= t-1 = 3 − 1= 2, Df$_E$=33, Df_T =tr-1 =35

$SS_t = \frac{\sum y_i^2}{r}$ − cf , Cf =$\frac{y_.^2}{tr}$ = $\frac{154^2}{36}$ = 658.78 , SSt= $\frac{2780}{12}$ - 658.78 =-427.11

SST= 2121.22 , MSt= -213.555 , MSE=2515.33 ,F − cal =-0.084

Table 2 : ANOVA for Levels of Tumor

S.0.v	df	SS	MS	F - cal	F –table
Treatment	2	-42711	-213.555	0.084	2.33
Error	33	2548.33	2515.33		

Total	35	2121.22			

Table 3 : LSD table to compare between A,B and C

	Mumps disease A=T1	Smallpox water B=T2	Liver Disease C=T3	TOTAL
R1	2	11	0	13
R2	5	6	0	11
R3	27	13	1	4
R4	29	27	1	57
R5	1	5	0	6
R6	1	3	0	4
R7	1	0	0	1
R8	2	0	0	2
R9	1	0	0	1
R10	1	2	1	4
R11	1	0	1	2
R12	7	5	0	12
$\sum yi$	78	72	5	154
$\overline{yi}$	65	6	0.33	

$$Ssr = \frac{\sum y_i{}^2}{t} - cf \; , \; Cf = \frac{y_.{}^2}{tr} = \frac{154^2}{36} = 658.78, \; SSt = \frac{2780}{3} - 658.78 = 267.89$$

$$MSr = \frac{ssr}{r-1} = \frac{267,89}{11} = 24,354 \; , \; LSD = t_{\alpha ,df} \times S\overline{y} \; , \; t_{0.025 ,33} = 2.036$$

$$S\overline{y} = \sqrt{\frac{2MSE}{r}} = \sqrt{\frac{2(2515.33)}{12}} = 20.475$$

$$LSD = 2,O36 \times 20.475 = 41.687$$

Table 4 : ANOVA table to compare between A,B and C

S.0.v	df	SS	MS	F - cal	F –table
Reps	11	267.89	24.354		
Treatment	2	-42711	-213.555	-0.084	0.05, 2.33 ,33
Error	33	2548.33	2515.33		
Total	35	2121.22			

Table 5: Mean values

Mean	Treatments
0.33	C
6	B
65	A

Table 6: LSD table

Mean	Treatments
0.33 b ,a	C
6 a	B

4. Conclusion

There exist no significant deference between level of tumor .Also, we compare these difference with the value of LSD (41.687) . There exist the difference between levels of tumor is less than (41.687) ,this mean that there is no difference between treatment . But in other word , there exist the difference is greater than (41.687) , this mean that, there is difference between treatment (levels of tumor).

Reference

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