LECTURE 17

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the high yeld

$$\chi^2 = \sum \frac{(O-E)^2}{E}$$

$$E = \frac{total\ column \times total\ rows}{Grand\ \ total}$$

*We have two or more than two groups and or with
two or more.
*A contingency table also used than two outcome
*more than two rows and or more than two columns .
*In another word more than four cells.
* There is no continuity correction
Chi square is only valid if applied to the actual numbers in the various categories .
*it must never be applied to table showing just proportions or percentages.

procedure

Chi square calculation procedure
✓ Calculate the expected values E for each cell
✓Calculate the value O- E for each cell
✓ O is the observed
✓ Square O-E
✓ Divide each squared O- E by E for each cell
✓ Sum all of the values in previous step
this result is called test statistic
✓ identify the critical chi-square obtained
✓ from the chi square table.
❑ To reject the null hypothesis of equal proportion i.e. of independent variables the value of the test statistics must exceed the critical chi-square obtained from the chi square table.

Validity of Chi Square

*when the overall total is more than 40 , regardless the expected values and
*when the overall total between 20 and 40 provided that all expected values are at least 5
*Chi square is valid provided that less than 20% of expected numbers are less than 5 And none is less than 1
**When the expected numbers are very small the chi We recommended other test (Exact Test)
*Chi square test is not valid when we have cell zero

Fisher's exact test of independence

-is a statistical significance test used in the analysis of
contingency tables where sample sizes are small.
-The test is useful for categorical data.
-Most uses of the Fisher test involve, like this example, a 2 × 2 contingency table.
-Fisher's exact test is more accurate than the chi-squared test of independence when the expected numbers are small.
-The most common use of Fisher's exact test is for 2×2 tables,
-You can do Fisher's exact test for greater than two rows and columns.
-when sample sizes are small, or
-the data are very unequally distributed among the cells of
the table.
-If all of the expected values are very large, Fisher's exact test becomes computationally impractical.