



Hypothesis Testing

- ✓ Parametric &
- ✓ Non-Parametric Test

Biostatistics & Research Methodology

B Pharm 8th Sem | M. Pharm. | PhD

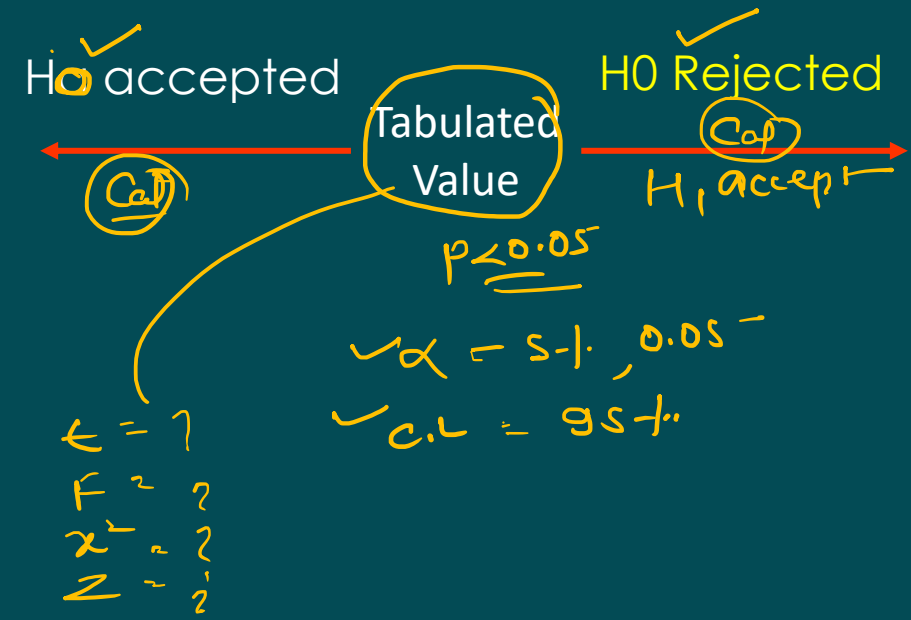
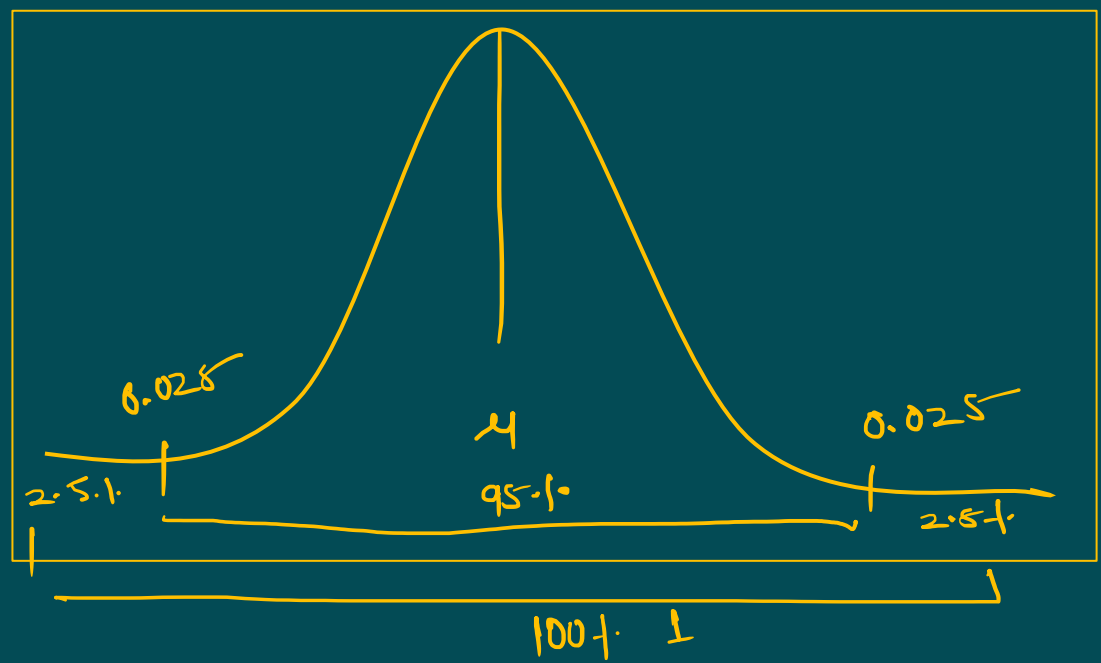


Hypothesis Testing

- Check whether proposed hypothesis is true or false by using various parametric and non parametric test ✓
- It indicate whether H0 is accepted or rejected ✓ $\rightarrow H_1 = \text{Accept.}$
- H0 accepted- means of samples has no significant difference ($\bar{X} = \bar{Y}$)
- H0 Rejected or Ha accepted – means of sample has significant difference ($\bar{X} \neq \bar{Y}$)

$\bar{Y} < \bar{X}$ = significant reduce the Blood Sugar level

Anti diabetic drug - "A"
 D.C. vs drug
 B.Sugar level
 ↓
 210 mg/dL ± SD 190 ± SD
 ↓
 $\bar{X} = \bar{Y}$ (H0)
 $\bar{X} \neq \bar{Y}$ (H1)



Hypothesis Testing



Parametric Test	Non Parametric Test
Used in parametric data ✓	Used in non-parametric data
Originated from a population distributed data ✓	Does not required any population distributed data
The assumption that the population data are normally distributed ✓✓	No ant assumption about population distribution
Data- Age, weight, marks ✓✓✓	Data- beauty
Test- Z test, T-test, ANOVA ✓✓✓	Test- X2 test, Fisher test, Wilcoxon rank, etc ✓✓✓

Hypothesis Testing



Property	Parametric Test	Non Parametric Test
Assumption	Yes ✓	No ✓
Central Tendency	Mean ✓	Median ✓
Correlation	Karl Pearson ✓	Spearman ✓
Distribution	Normal ✓	Attributory ✓
Population Knowledge	Required ✓	Not Required ✓
Application	Variable ✓	Attributes ✓ and variable ✓

Hypothesis Testing



Parametric Test

Z Test

- $N > 30$
- Variance Known
- Comparing the mean

T-Test

- $N < 30$
- Variance is unknown
- Comparing the mean

F-Test

- Comparing the SD

ANOVA

- Comparing > 2 group
- One Way, Two Way, Multiple Way

Non Parametric Test

Goodness of Fit

- χ^2 Test
- Anderson darling
- Kuiper's Test
- Hosmer Lemeshow Test

Test of Independence

- χ^2 Test
- Fisher's Exact

Test of Homogeneity

- χ^2 Test
- Wilcoxon Rank test
- Mann Whitney Test
- Kruskal Wallis
- Friedmann's Test
- Levene Test