MULTIPLE LINEAR REGRESSION	MULTIPLE LOGISTIC REGRESSION	COX PH REGRESSION
$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \ldots\ldots \beta_nX_n$	$\left(\frac{p}{1-p}\right) = e^{\beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \ldots\ldots \beta}$	$\frac{h(t)}{ho(t)} = e^{\beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \ldots\ldots \beta}$
Numerical outcome	Dichotomous outcome	Time to event
Regression Coefficient,95%CI,p-value	*Odds Ratio*,95%CI,p-value OR = e^{bx}	*Hazards Ratio*,95%CI,p-value HR = e^{bx}
STEPS:	**STEPS:**	**STEPS:**
I. Data Exploration & Cleaning	I. Data Exploration & Cleaning	I. Data Exploration & Cleaning
II. Univariable Analysis (**SLR**) **F Test**	II. Univariable Analysis (**SLogR**) - **OR** - [X^2 (Chi Square),Fisher's Exact → categorical; Ind t/ M-W → Numerical] **LR/Wald Test**	II. Univariable Analysis (**SCR**) **LR/Wald Test**
III. Variable Selection (**MLR**)	III. Variable Selection (**MLogR**)	III. Variable Selection (**MCR**)
IV. Multicollinearity & Interaction	IV. Multicollinearity & Interaction	IV. Multicollinearity & Interaction
V. Checking Assumption (**LINE-I-I**)	V. Checking model adequacy (**HLCCA**)	V. Checking Assumption (**HLS**)
VI. Interpretation, Conclusion & Presentation	VI. Interpretation, Conclusion & Presentation	VI. Interpretation, Conclusion & Presentation

SLR: Simple Linear regression **MLR**: Multiple Liner Regression **SLogR**: Simple Logistic Regression **MLogR**: Multiple Logistic Regression

SCR: Simple Cox Regression **MCR**: Multiple Cox Regression

LINE-I-I: Overall **L**inearity, **I**ndependent sample, **N**ormality, **E**qual variance, **I**ndividual linearity I-Interaction between numerical independent variables

HLCCA: **H**osmer-**L**emeshow test, Pearson **C**hi-square goodness of fit, Overall Correctly **C**lassified Percentage, **A**rea under the curve

HLS: **H**azard Function Plot, **L**og – Minus – Log plot (LML plot), **S**choenfeld residuals (partial residuals)

Terms used on models

STEP III: Preliminary Main Effect Model ***STEP IV: Preliminary Final Model*** ***STEP V: Final Model***

***Note:* In SPSS, *Forward method* retains more variables in MULTIPLE LINEAR REGRESSION while *Backward method* retains more variables in MULTIPLE LOGISTIC REGRESSION & COX PH REGRESSION**

COMPARISON BETWEEN REGRESSION GROUP AND GLM GROUP

		REGRESSION GROUP	GLM GROUP
1	Analysis	1. Exploratory / explanatory analysis	1. Confirmatory analysis
2	Objective	1. Association 2. Prognostic 3. Contributing / influencing factors	1. Difference of means
3	Outcome	1. Continuous 2. Categorical (binary / nominal / ordinal) 3. Time to event 4. Count 5. Rate	1. Continuous
4	Study design	1. Cross sectional 2. Case control 3. Prospective cohort 4. Retrospective cohort 5. RCT	1. Cross sectional 2. RCT 3. Repeated measures

COMPARISON BETWEEN LR STATISTIC AND WALD

	LR	WALD
1	Check significance of variable and model	Check significance of variable only
2	Compare 2 level group. If more than 2 level, tedious to present	Compare more than 2 level group
3	Deviance ➔ $M_0 - M_1$ ➔ Best fit principle	Wald $X^2 = (b/SE)^2$ → SPSS Wald Z = b/SE → Stata
4	-2 log likelihood ➔ LR – X^2 ➔ Near to '0' is better ➔ Probability log (1) = 0	
5	-2 log likelihood will reduce to near '0' when variable is added	

BONFERRONI CORRECTION

	METHOD 1	METHOD 2
1	Correct α	Correct *p*
2	$\frac{\alpha}{no\ of\ pairs}$ → compare with p value	P value x no of pairs, compare with α
3		Not statistically meaningful if p value obtained is more than 1 - Probability cannot be more than 1 - Have redundancy