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Taipei Tzu Chi Hospital,
Buddhist Tzu Chi Medical Foundation

SPSS操作

研究部 曾奕翔 博士

生物統計諮詢服務

- 一、地點：13A教學部生物統計諮詢室或雙方約定之合適地點 分機3119
- 二、時間：雙方約定適合之時間
- 三、講師介紹：曾奕翔 博士
- 四、經歷:

臺灣臨床試驗生統中心、培訓中心、與藥物基因體實驗室博士後研究員(105~106)

林口長庚紀念醫院急診醫學科博士研究員(102~105)

國立臺灣大學公共衛生學院基因、環境與健康研究中心博士後研究員(98~102)

兩篇文章

- Yang T, Xing H, Wang G, Wang N, Liu M, Yan C, Li H, Wei L, Li S, Fan Z, Shi M, Chen W, Cai S, Pawlik TM, Soh A, Beshiri A, Lau WY, Wu M, Zheng Y, Shen F. A Novel Online Calculator Based on Serum Biomarkers to Detect Hepatocellular Carcinoma among Patients with Hepatitis B. Clin Chem. 2019 Dec;65(12):1543-1553. doi: 10.1373/clinchem.2019.308965. Epub 2019 Oct 31. PMID: 31672853.
- Yu XQ, Wang MJ, Yu DM, Chen PZ, Zhu MY, Huang W, Han Y, Gong QM, Zhang XX. Comparison of Serum Hepatitis B Virus RNA Levels and Quasispecies Evolution Patterns between Entecavir and Pegylated-Interferon Mono-treatment in Chronic Hepatitis B Patients. J Clin Microbiol. 2020 Aug 24;58(9):e00075-20. doi: 10.1128/JCM.00075-20. PMID: 32554476; PMCID: PMC7448659.

A Novel Online Calculator Based on Serum Biomarkers to Detect Hepatocellular Carcinoma among Patients with Hepatitis B

- Early detection of hepatocellular carcinoma (HCC) among hepatitis B virus (HBV)-infected patients remains a challenge, especially in China
- alpha-Fetoprotein (AFP), lens culinaris agglutinin A-reactive fraction of -fetoprotein (AFP-L3), and protein induced by vitamin K absence or antagonist-II (PIVKA-II) and several other biomarkers have been established as HCC-specific tumor markers.
- We sought to create an online calculator of serum biomarkers to detect HCC among patients with chronic hepatitis B (CHB)

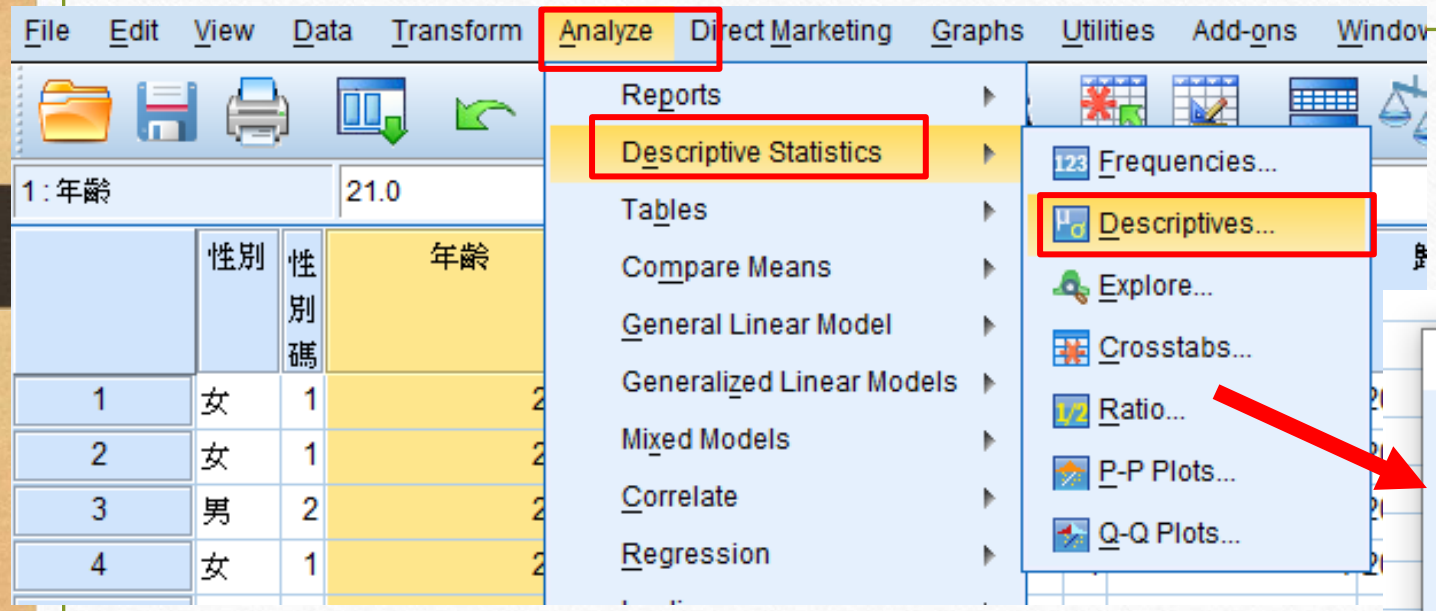
STATISTICAL ANALYSIS

- For demographic data, categorical variables were expressed as percentages and continuous variables as mean (SD)
- ROC curves were used to calculate the best cutoff points and to determine the area under the curve (AUC) for AFP and PIVKA-II alone or both as predictors
- The AUC, sensitivity, and specificity were used to report diagnostic accuracy

SPSS操作-敘述統計

- An example for continuous variables: age

SPSS操作-敘述統計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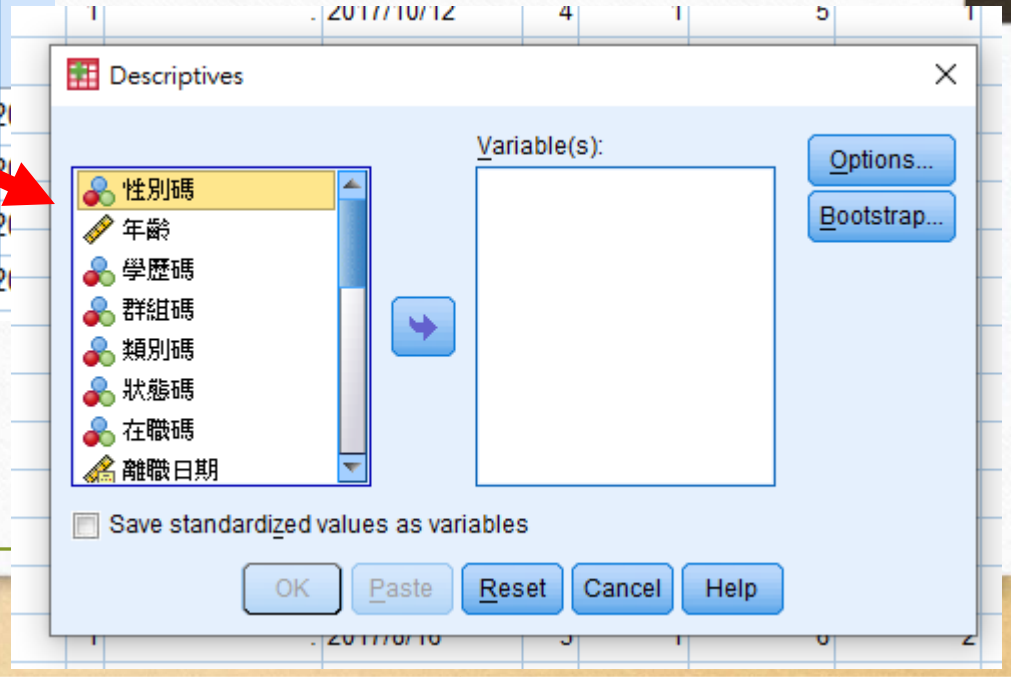
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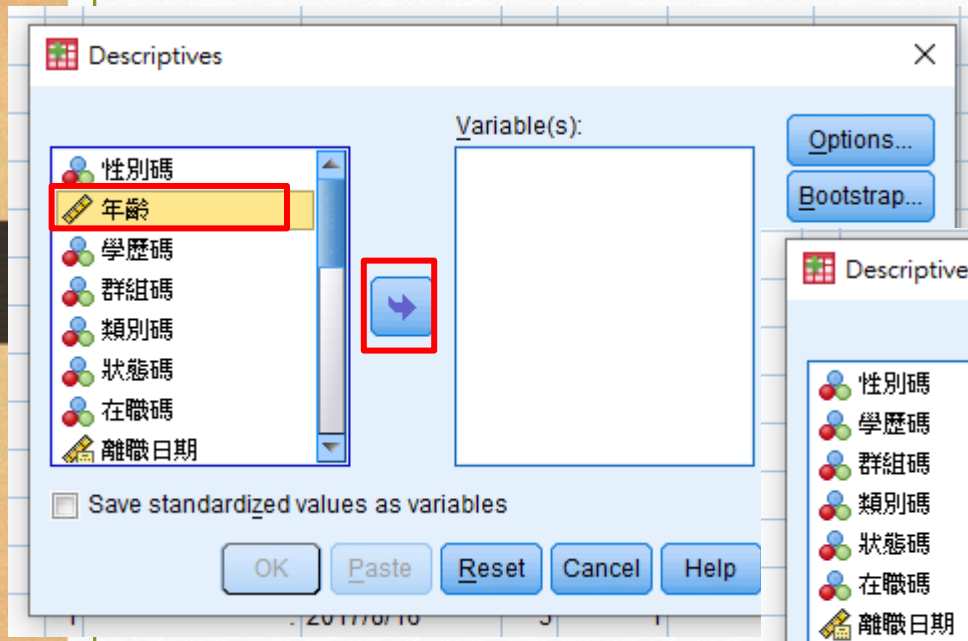
SPSS操作-敘述統計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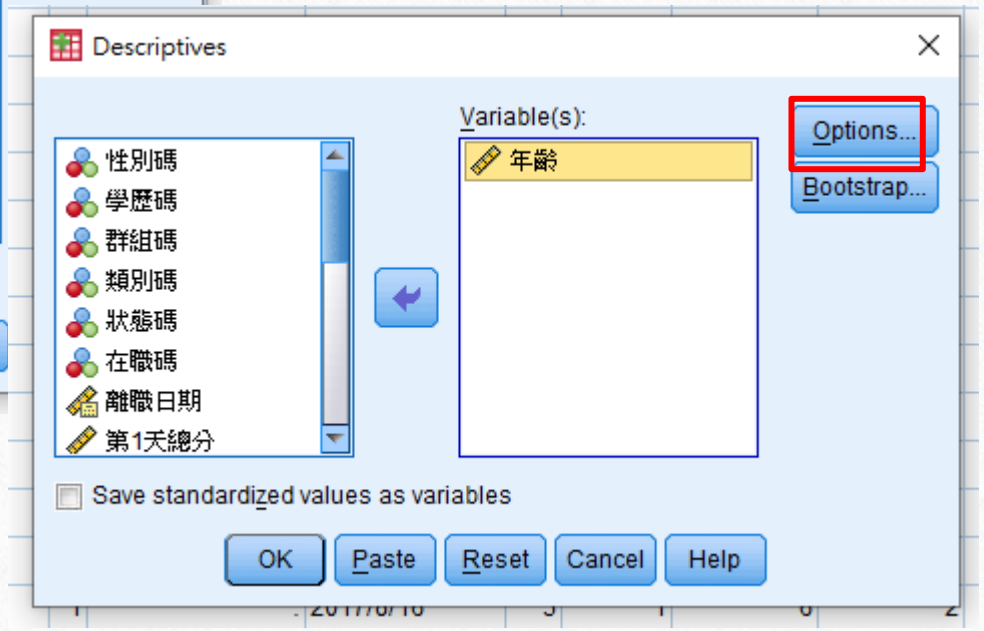
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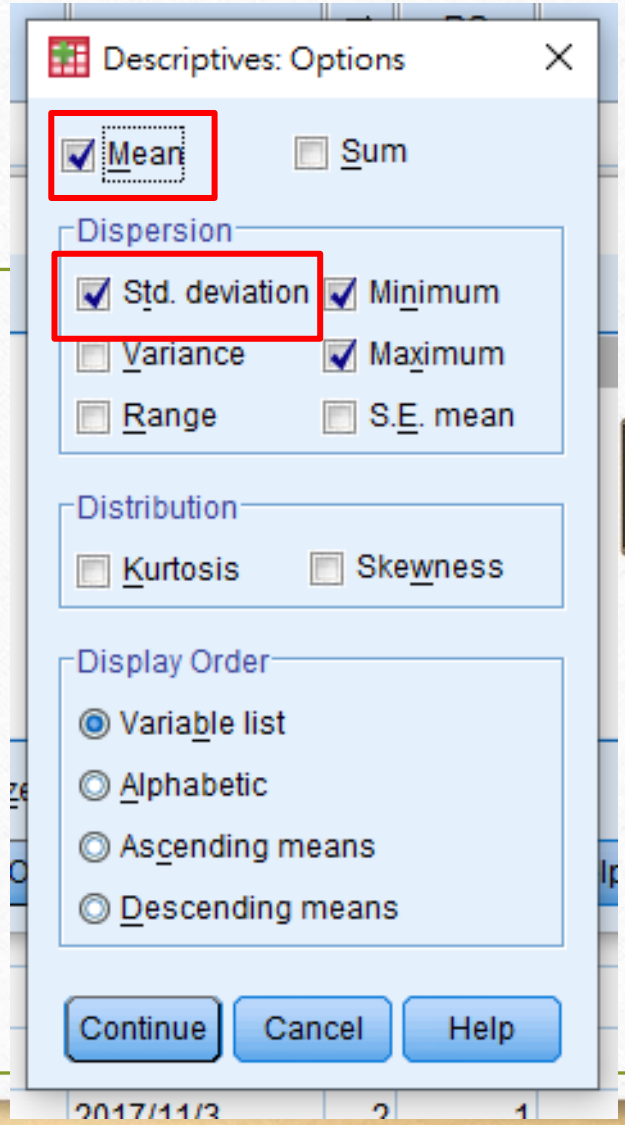
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Maximum
Range
S.E. mean
Distribution
Kurtosis
Skewness
Display Order
Variable list
Alphabetic
Ascending means
Descending means
Continue
Cancel
Help

SPSS操作-敘述統計

Descriptives

[DataSet2] C:[redacted]範例檔案.sav

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
年齡	912	20.0	26.0	21.500	1.3725
Valid N (listwise)	912				

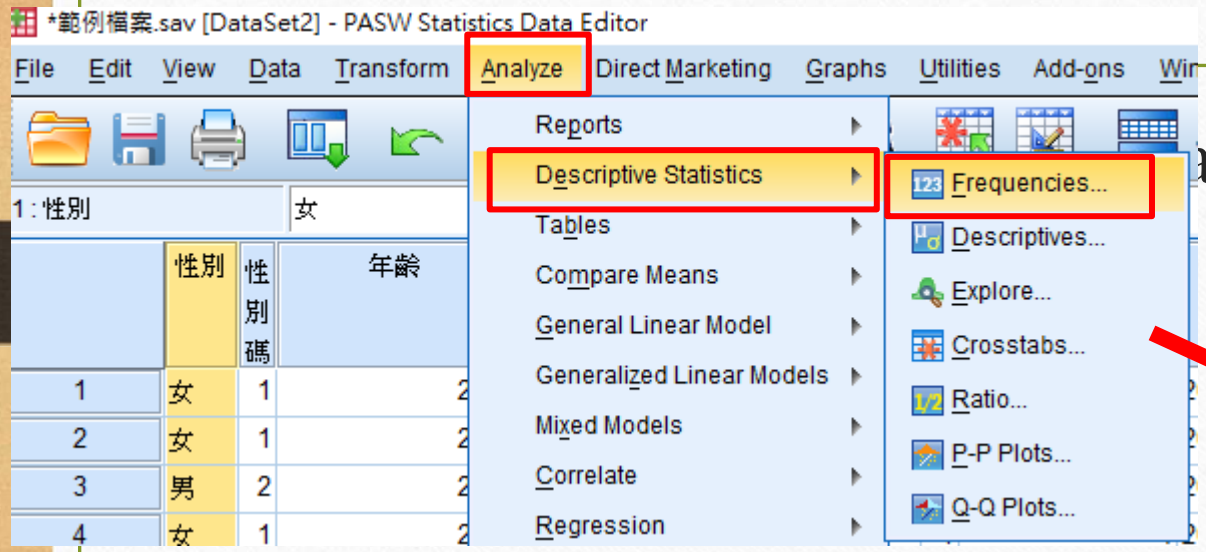
SPSS操作-敘述統計

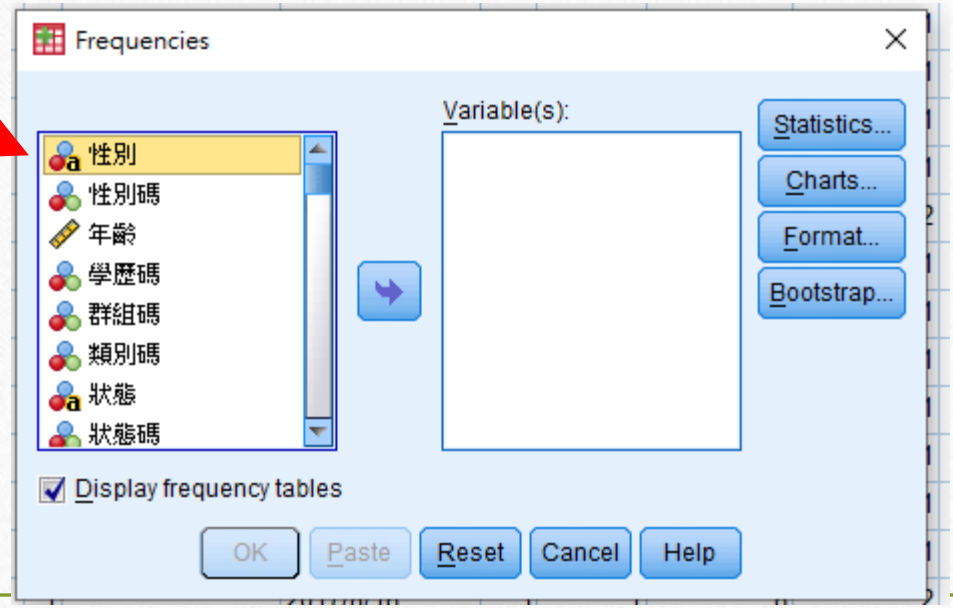
- An example for categorical variables: gender

	性別	性別碼	年齡	學歷碼
1	女	1	21.0	1
2	女	1	23.0	4
3	男	2	20.0	1
4	女	1	23.0	3
5	女	1	22.0	3

SPSS操作-敘述統計

ables: gender





SPSS操作-敘述統計

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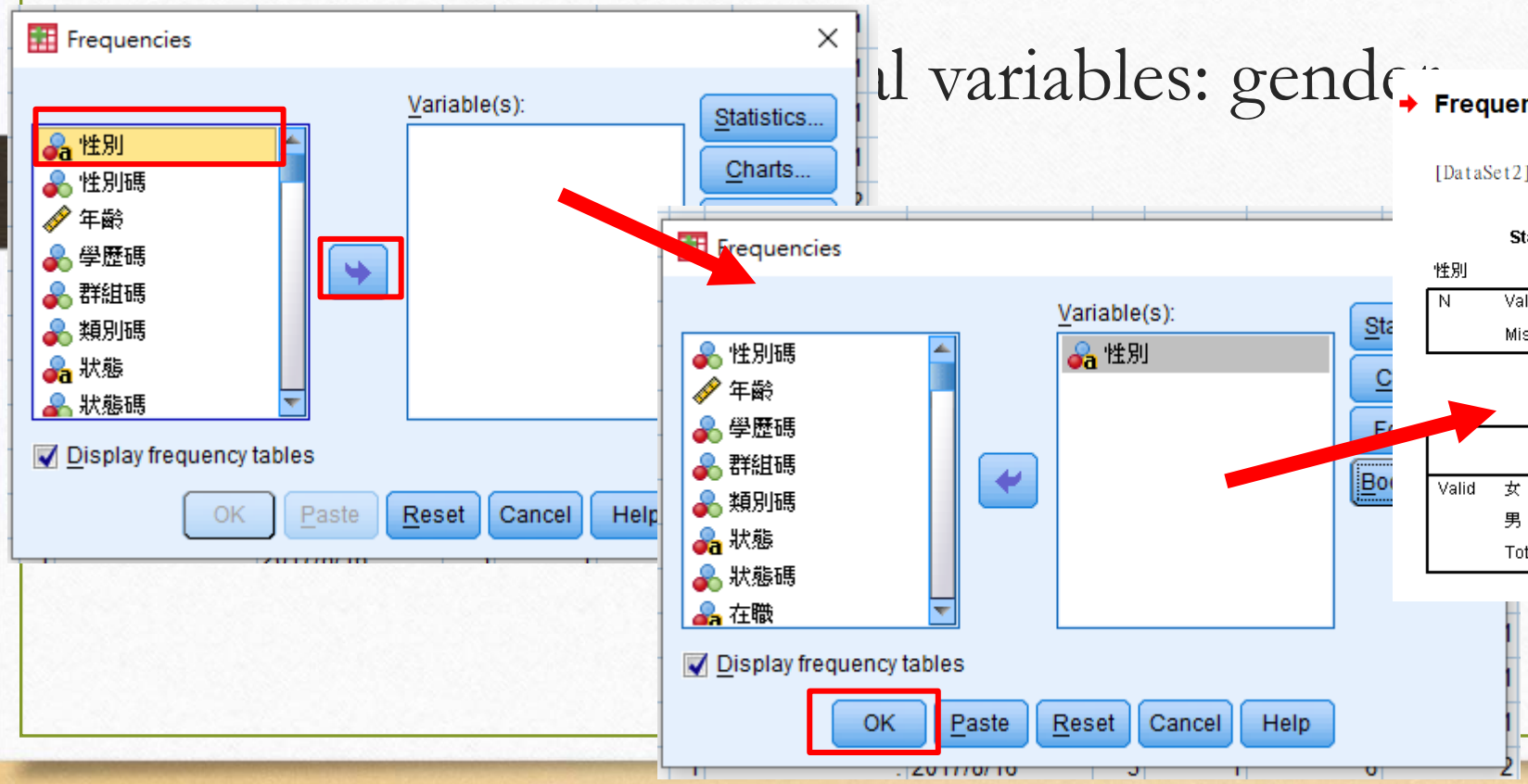


Frequencies

[DataSet2] C:[redacted]範例檔案.sav

Statistics

性別

N	Valid	912
	Missing	0

性別

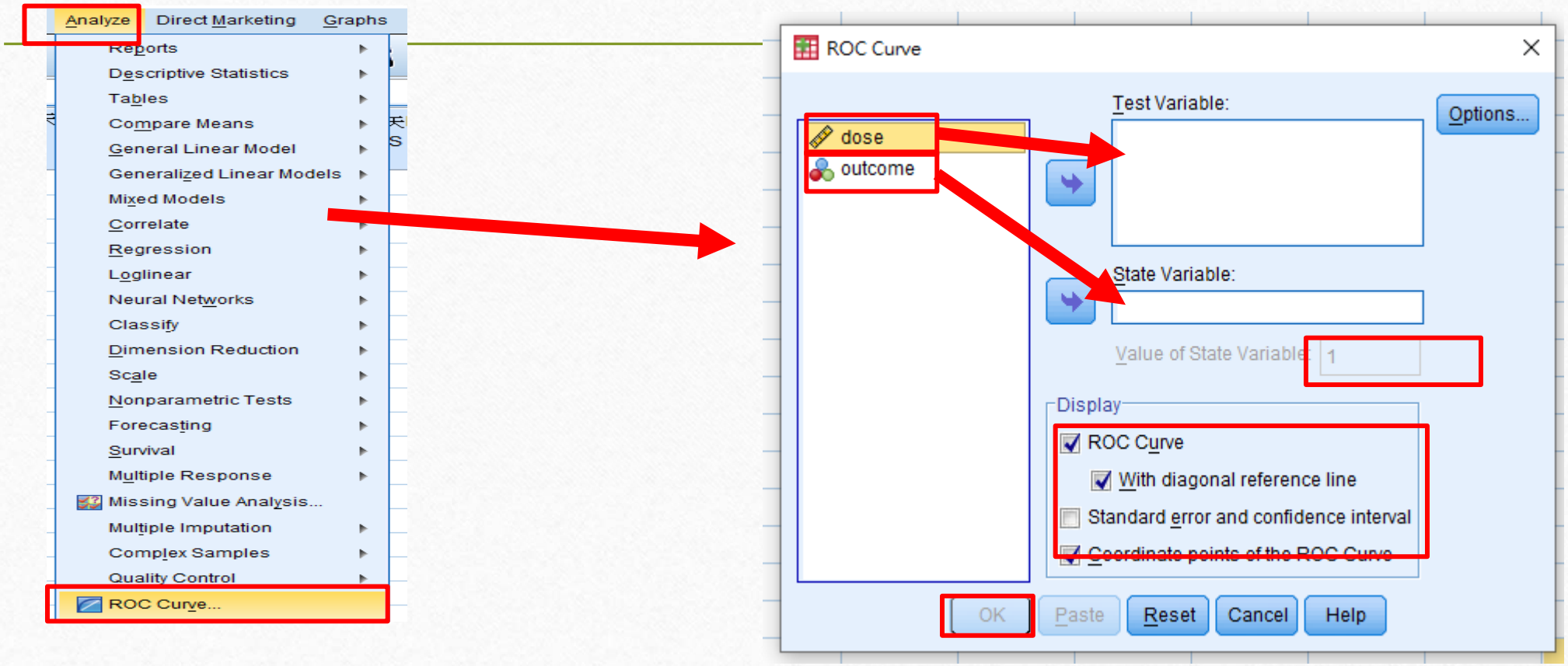
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	女	840	92.1	92.1	92.1
	男	72	7.9	7.9	100.0
	Total	912	100.0	100.0	

SPSS操作-ROC

- An example for ROC curve: dose predict outcome

	dose	outcome	va
1	.009491	0	
2	.056041	0	
3	.124635	0	
4	.274746	0	
5	.299705	0	
6	.454480	0	
7	.486070	0	
8	.523297	1	
9	.618059	0	
10	.660417	0	
11	.695391	0	
12	.752118	0	
13	.854031	0	
14	.879031	0	
15	.909260	1	
16	.974021	0	

SPSS操作-ROC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Generalized Linear Models
Mixed Models
Correlate
Regression
Loglinear
Neural Networks
Classify
Dimension Reduction
Scale
Nonparametric Tests
Forecasting
Survival
Multiple Response
Missing Value Analysis...
Multiple Imputation
Complex Samples
Quality Control
ROC Curve...
ROC Curve
dose
outcome
Test Variable:
Options...
State Variable:
Value of State Variable:
1
Display
ROC Curve
With diagonal reference line
Standard error and confidence interval
OK
Paste
Reset
Cancel
Help

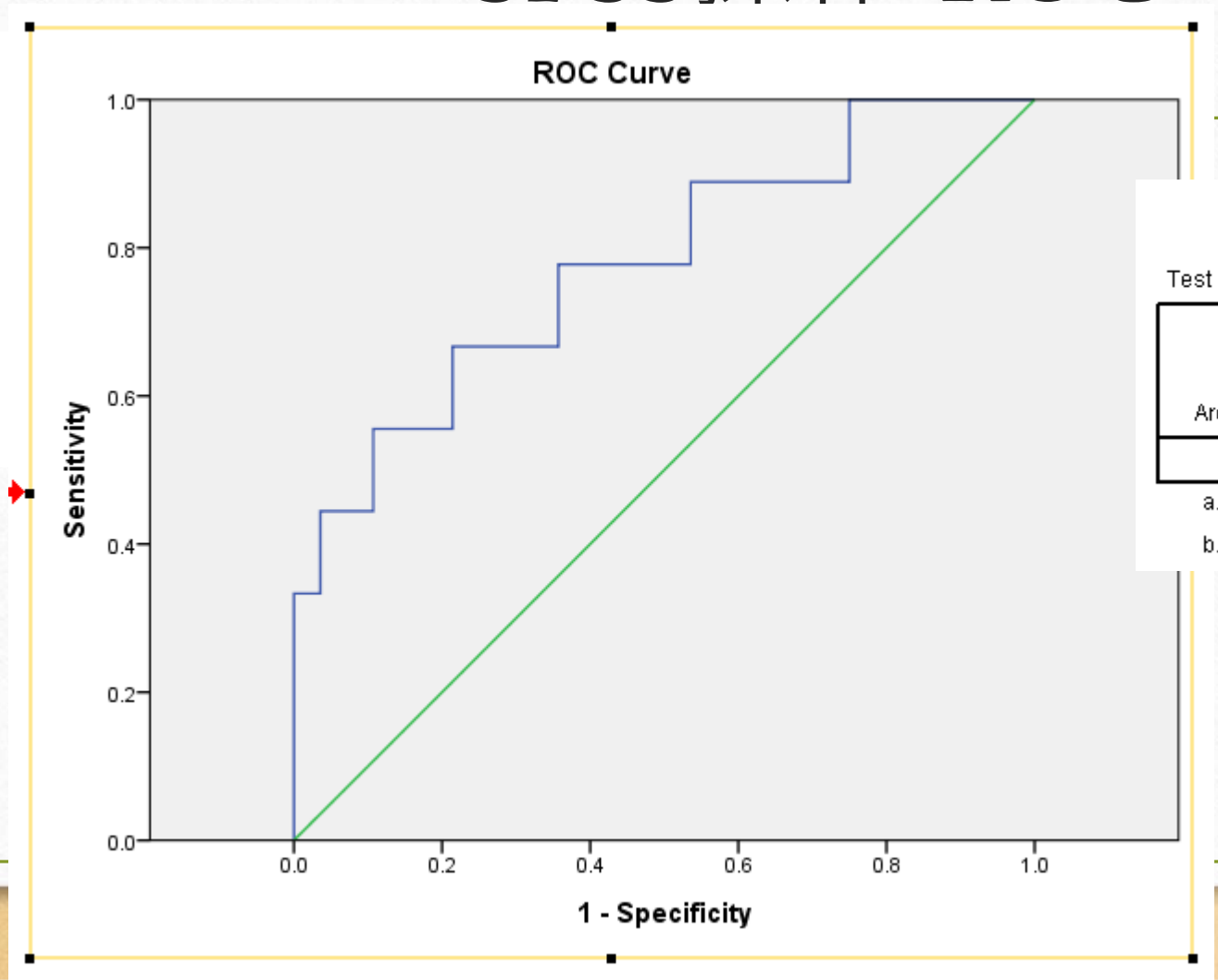
SPSS操作-ROC

Case Processing Summary

outcome	Valid N (listwise)
Positive[a]	9
Negative	28

Larger values of the test result variable(s) indicate stronger evidence for a positive actual state.

a. The positive actual state is treated.



Area Under the Curve

Test Result Variable(s):dose

Area	Std. Error[a]	Asymptotic Sig.[b]	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
.778	.094	.013	.593	.963

a. Under the nonparametric assumption

b. Null hypothesis: true area = 0.5

SPSS操作-ROC

Coordinates of the Curve

Test Result Variable(s):dose

Positive if Greater Than or Equal To[a]	Sensitivity	1 - Specificity
-.99050920	1.000	1.000
.03276607	1.000	.964
.09033810	1.000	.929
.19969022	1.000	.893
.28722517	1.000	.857
.37709230	1.000	.821
.47027512	1.000	.786
.50468369	1.000	.750
.57067789	.889	.750
.63923807	.889	.714
.67790422	.889	.679
.72375441	.889	.643
.80307454	.889	.607
.86653101	.889	.571
.89414543	.889	.536
.94164073	.778	.536
.97887344	.778	.500
1.00349495	.778	.464
1.06530701	.778	.429
1.11712305	.778	.393

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=C3-D3

Positive if Greater Than or Equal Toa	Sensitivity	1 - Specificity	Youden's index
-.99050920	1.000	1.000	0.000
.03276607	1.000	.964	0.036
.09033810	1.000	.929	0.071
.19969022	1.000	.893	0.107
.28722517	1.000	.857	0.143
.37709230	1.000	.821	0.179
.47027512	1.000	.786	0.214
.50468369	1.000	.750	0.250
.57067789	.889	.750	0.139
.63923807	.889	.714	0.175
.67790422	.889	.679	0.210
.72375441	.889	.643	0.246
.80307454	.889	.607	0.282
.86653101	.889	.571	0.317
.89414543	.889	.536	0.353
.94164073	.778	.536	0.242
.97887344	.778	.500	0.278

=sensitivity-(1-specificity)

Maximum of the Youden's index is the best critical point

Comparison of Serum Hepatitis B Virus RNA Levels and Quasispecies Evolution Patterns between Entecavir and Pegylated-Interferon Mono-treatment in Chronic Hepatitis B Patients

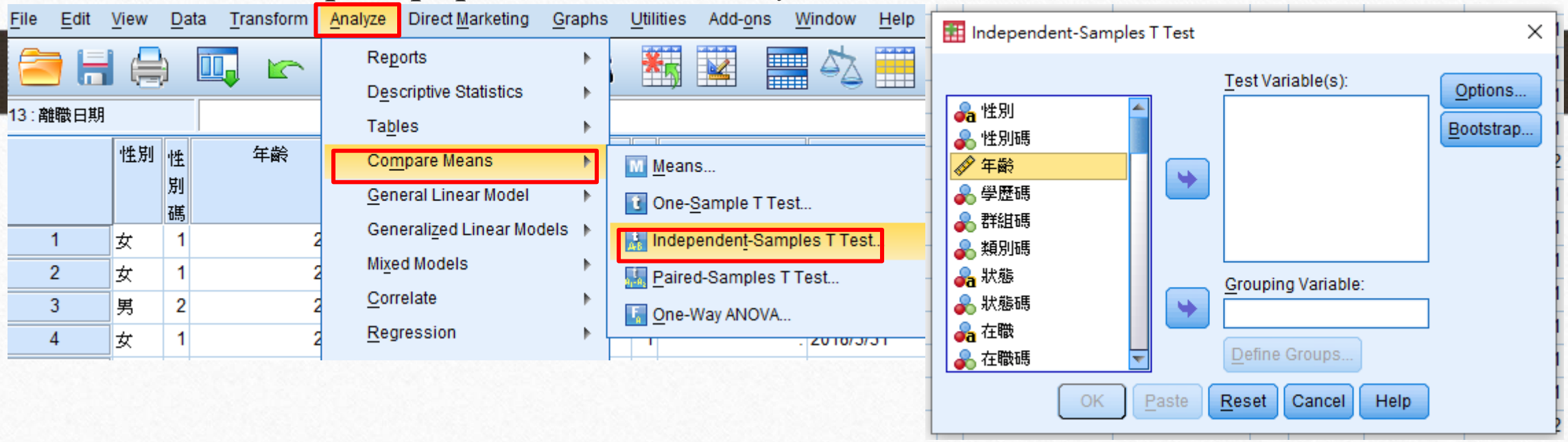
- Hepatitis B virus (HBV) RNA may independently predict virological and serological response
- HBV DNA, HBsAg, HBeAg, and HBV RNA data were log10 transformed prior to analyses and expressed as mean (standard deviation)

Statistical analyses

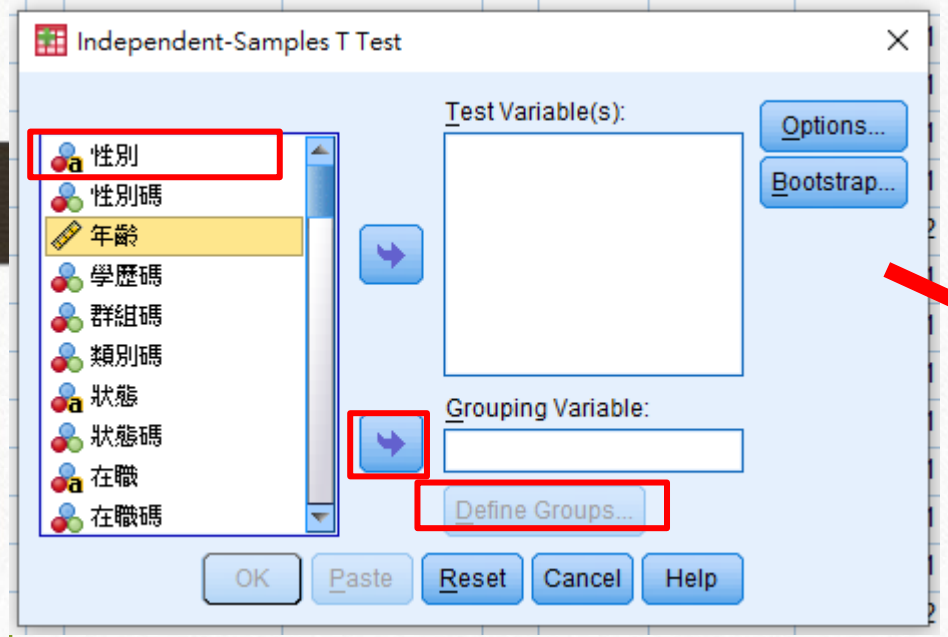
- The values were compared by Student's *t* test or the Mann-Whitney test as appropriate
- To assess the distribution of HBV genotypes in different patient groups, a chi-square test (2) was applied
- Logistic regression was used to identify factors associated with HBeAg seroconversion

SPSS操作-檢定

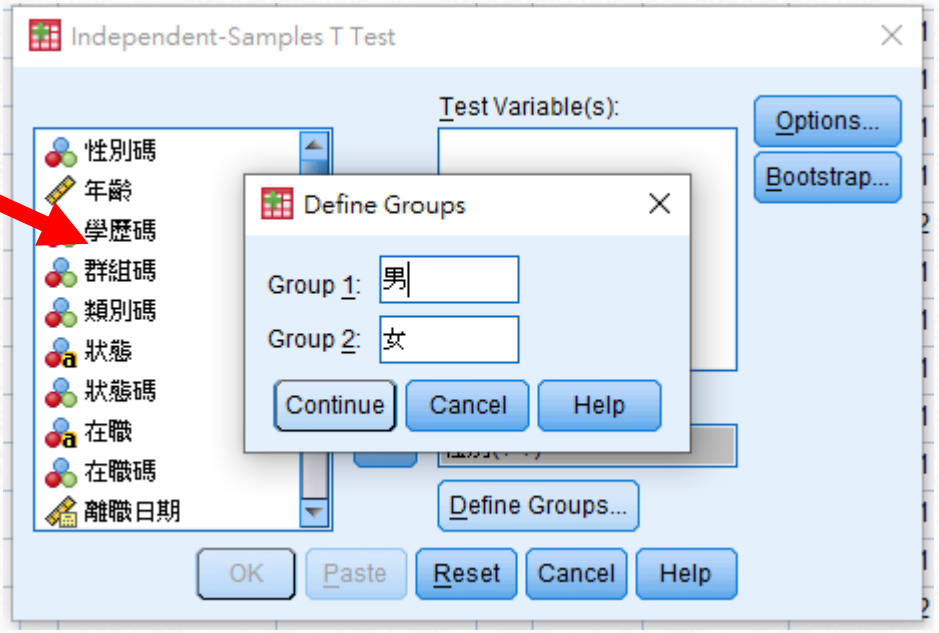
- If the samples' population is normally distributed: Student's *t* test



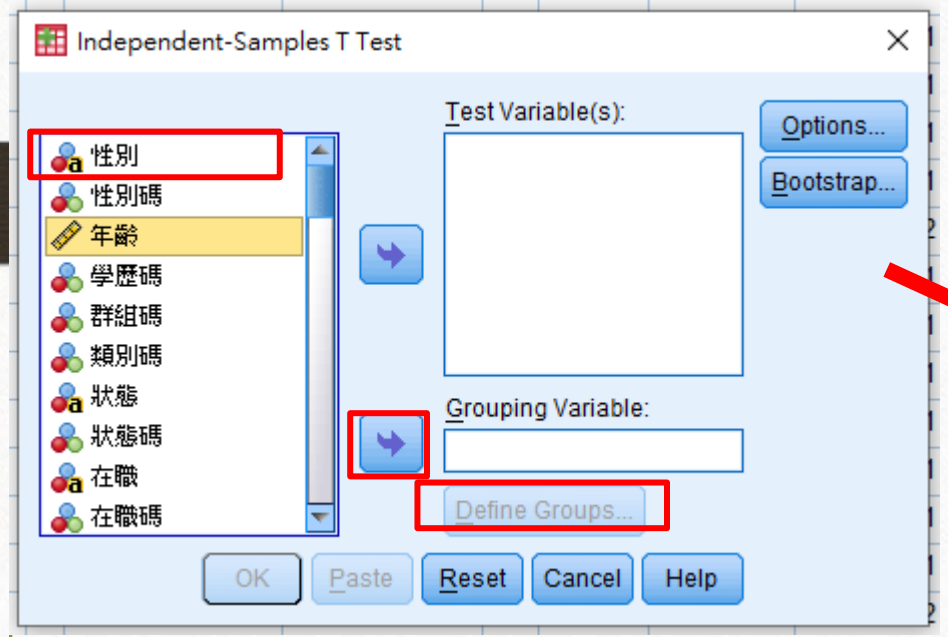
SPSS操作-檢定



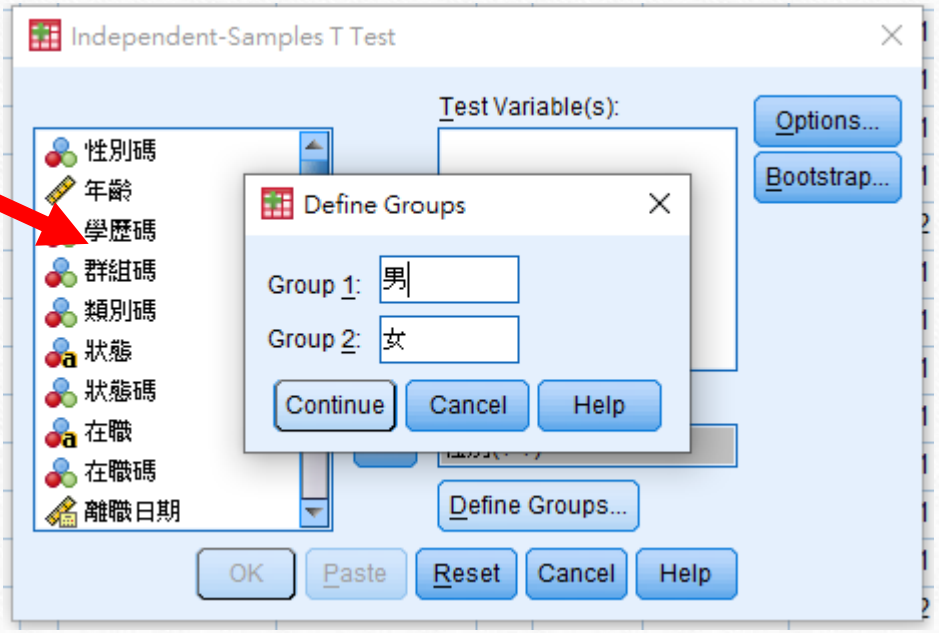
normally distributed: Student's *t* test



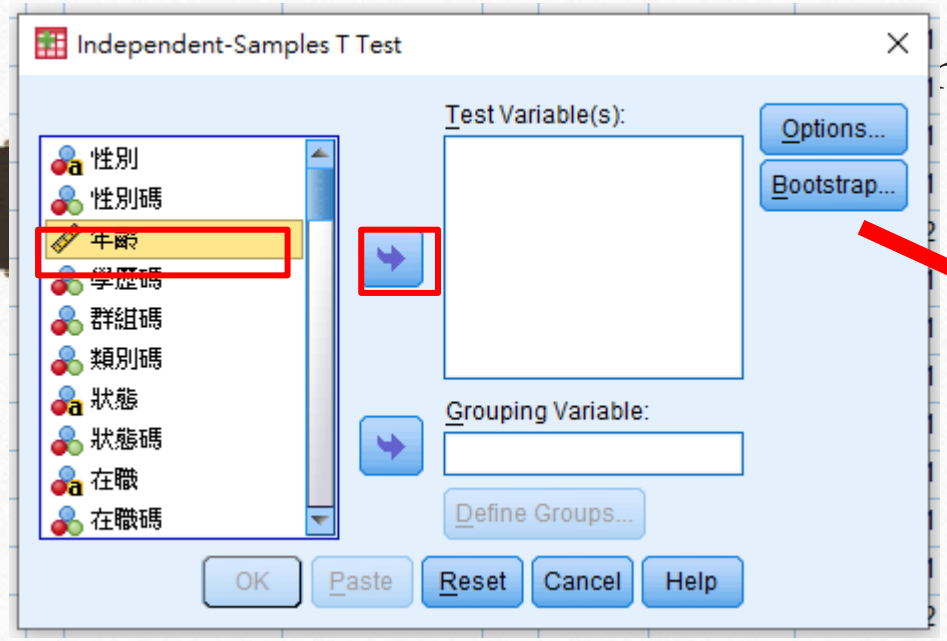
SPSS操作-檢定



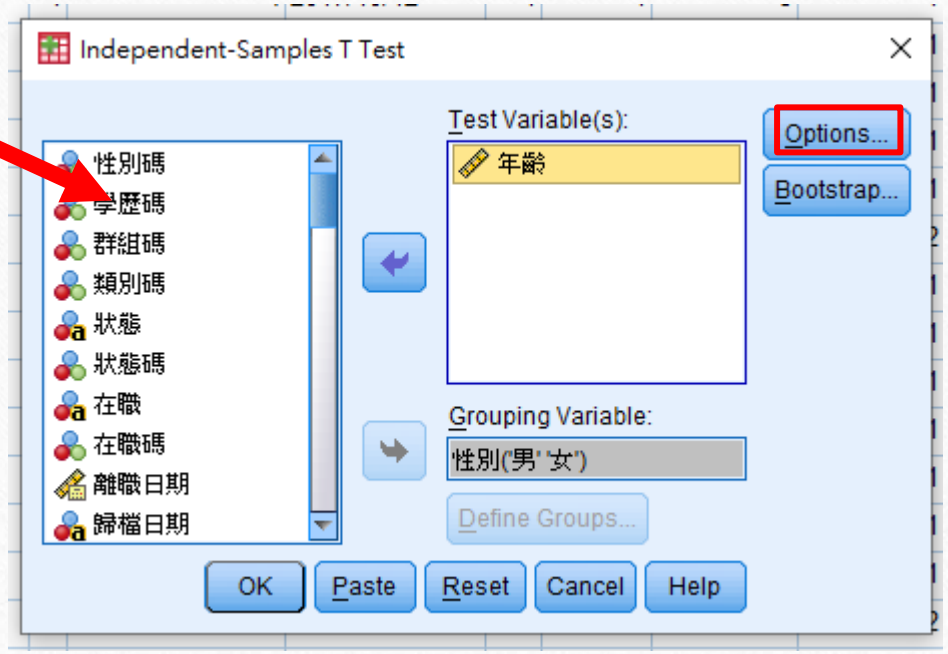
normally distributed: Student's *t* test



SPSS操作-檢定

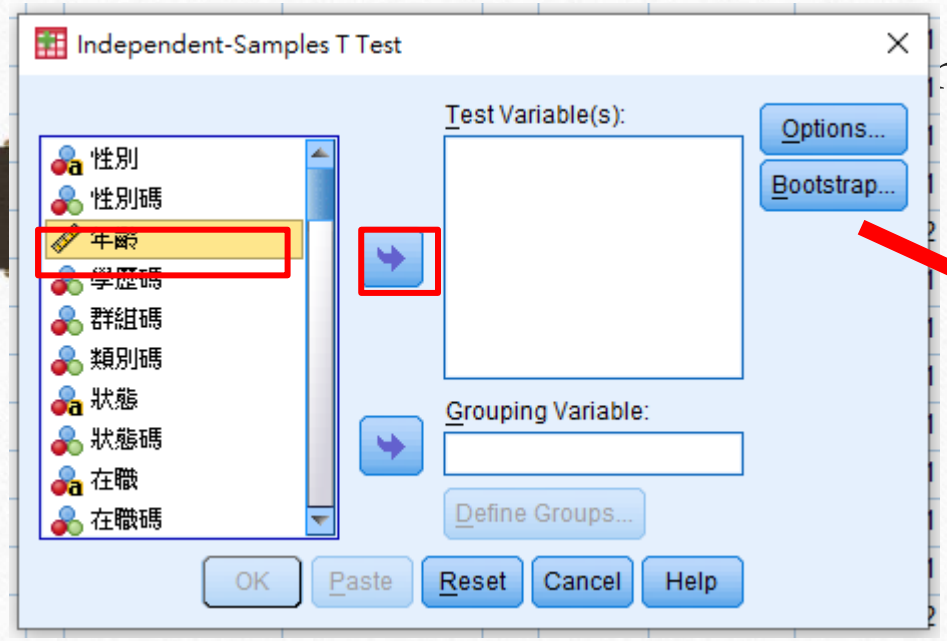


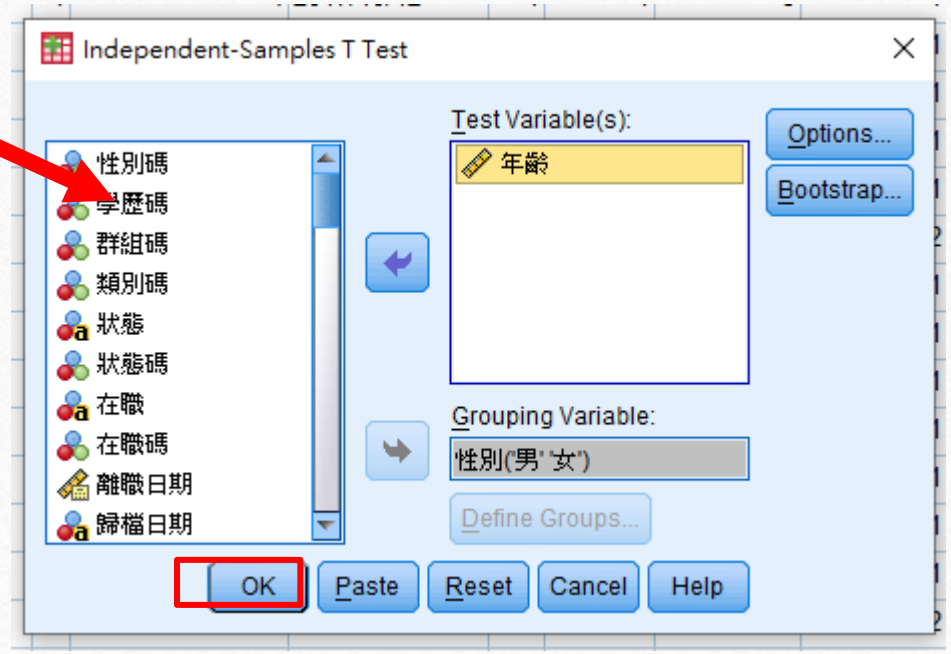
normally distributed: Student's *t* test



SPSS操作-檢定

normally distributed: Student's *t* test





T-Test

[DataSet2] C[redacted].sav

Group Statistics

	性別	N	Mean	Std. Deviation	Std. Error Mean
年齡	男	72	22.778	1.3658	.1610
	女	840	21.390	1.3173	.0455

Independent Samples Test

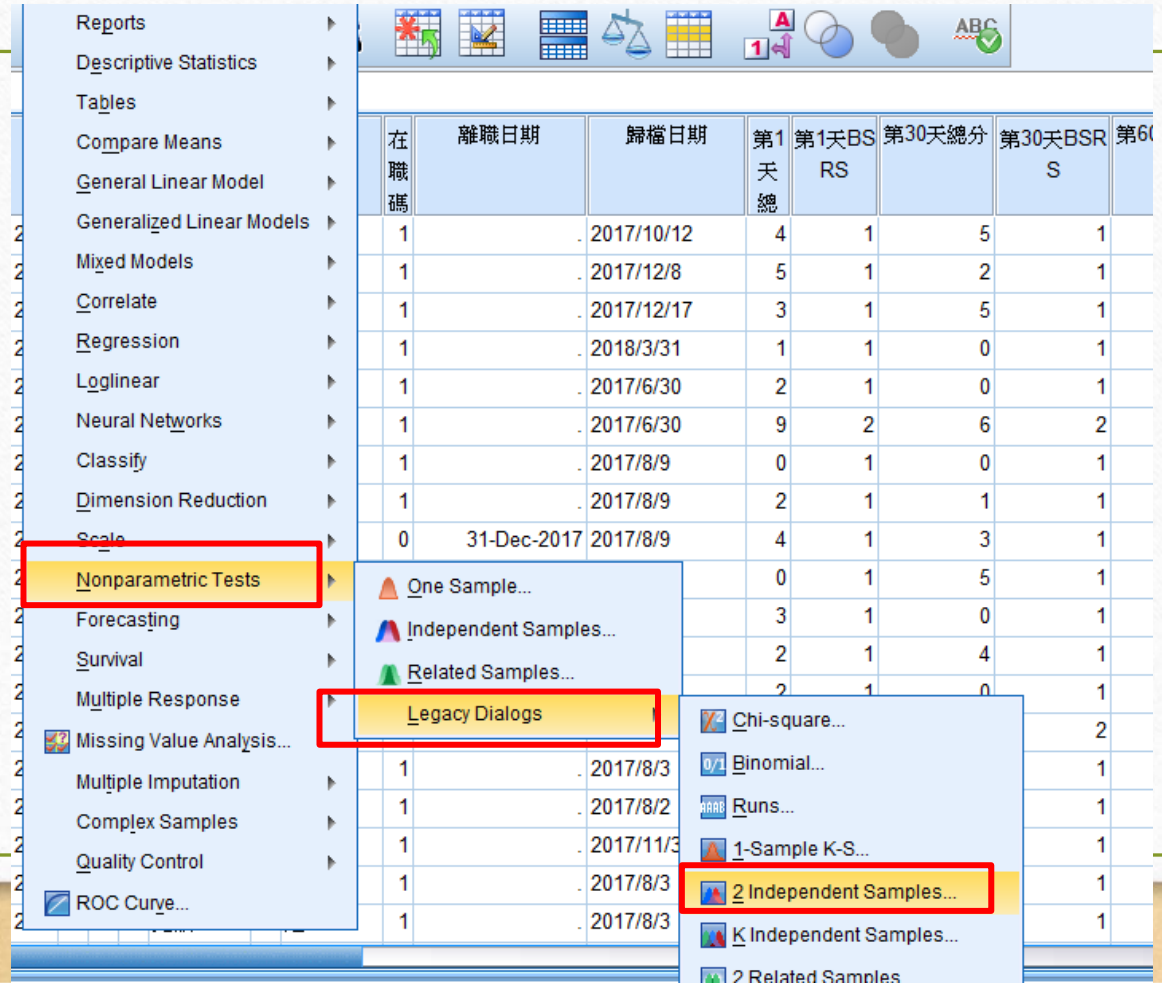
		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
年齡	Equal variances assumed	.399	.528	[illegible]	[illegible]	.000	1.3873	.1622	1.0689	1.7057
	Equal variances not assumed			8.295	82.72[illegible]	.000	1.3873	.1673	1.0546	1.7200

Levene's test p>0.05

Levene's test p<0.05

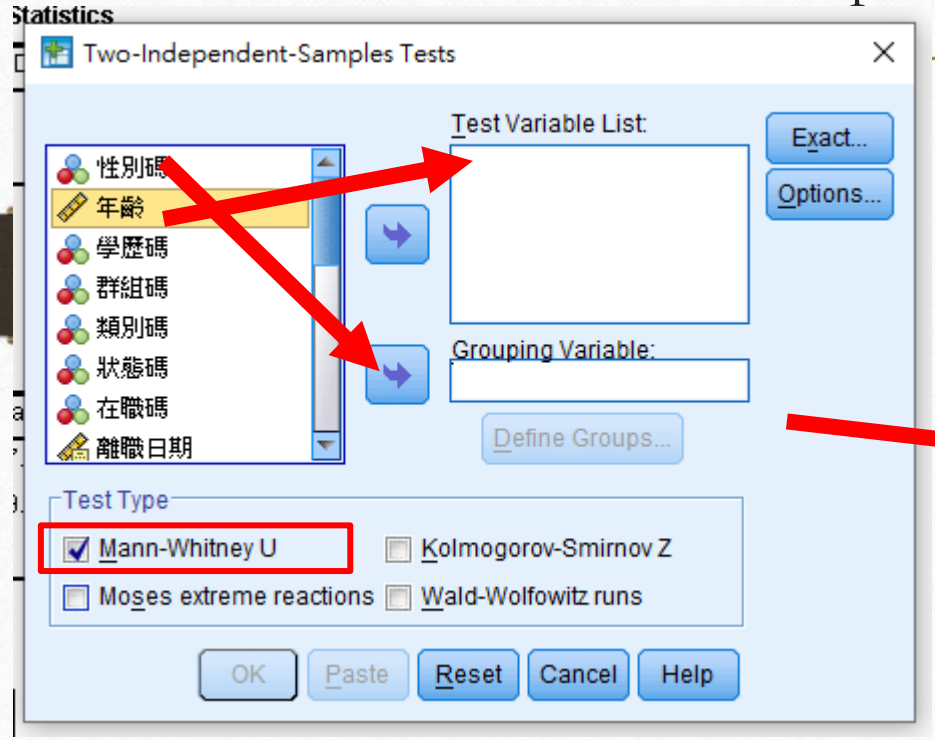
SPSS操作-檢定

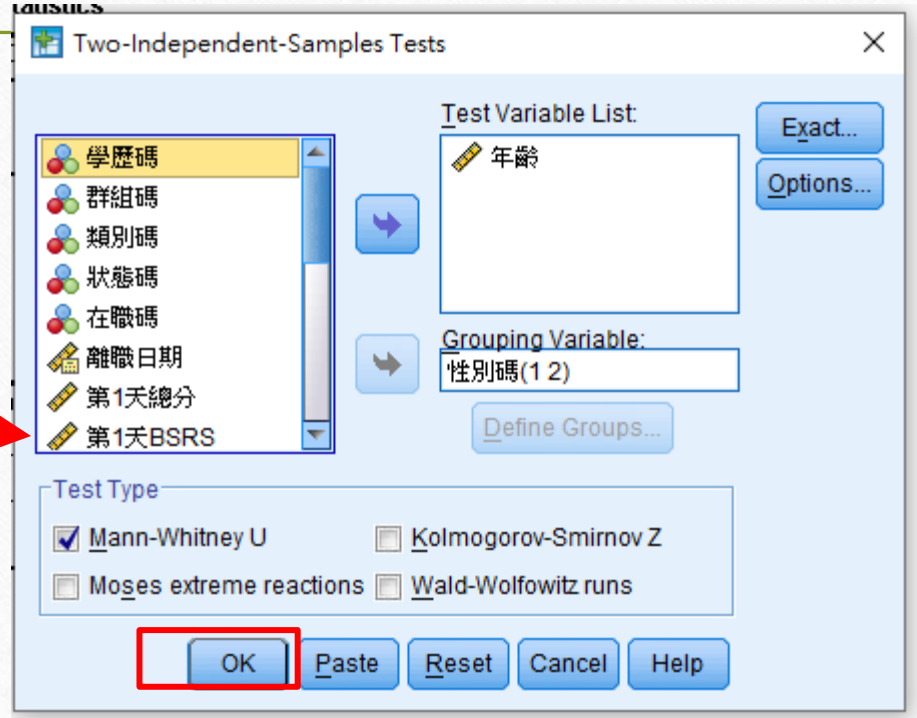
- If the distribution of samples‘ population is unknown: Mann-Whitney test



SPSS操作-檢定

- If the distribution of samples‘ population is unknown: Mann-Whitney test





SPSS操作-檢定

- If the distribution of samples‘ population is unknown: Mann-Whitney test

Mann-Whitney Test

Ranks

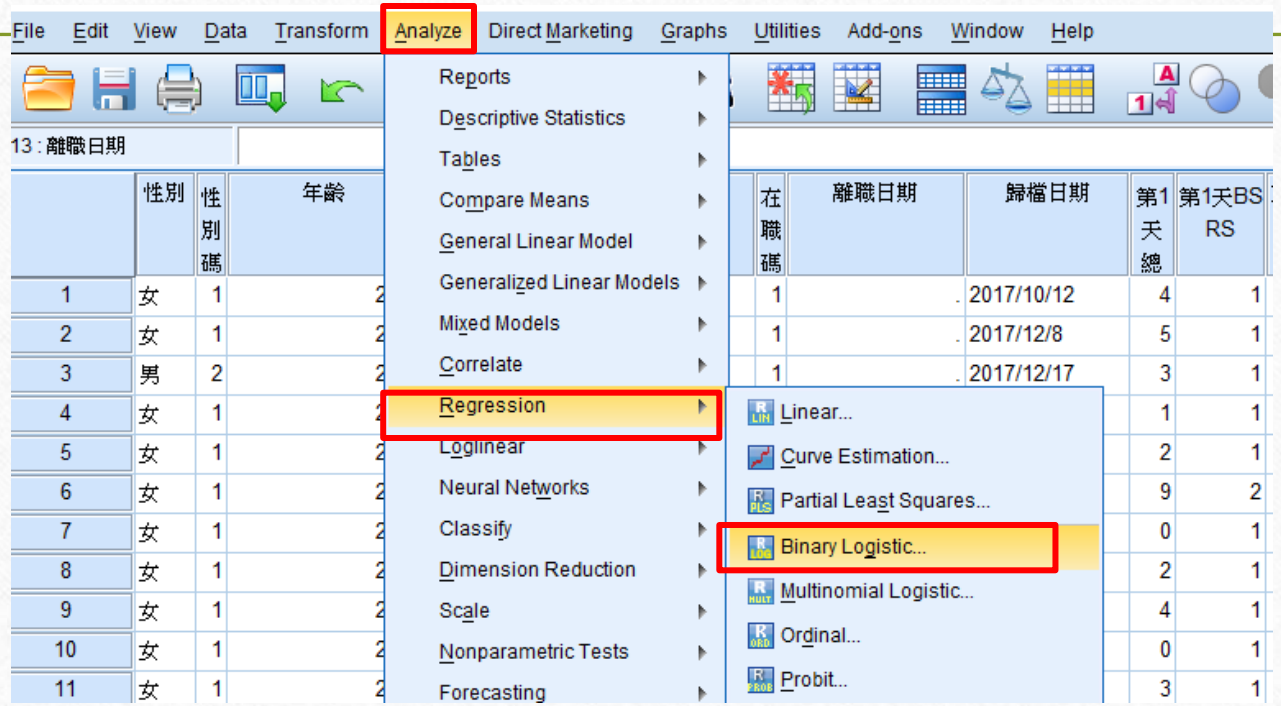
	性別碼	N	Mean Rank	Sum of Ranks
年齡	1	840	437.38	367396.00
	2	72	679.61	48932.00
	Total	912		

Test Statistics[a]

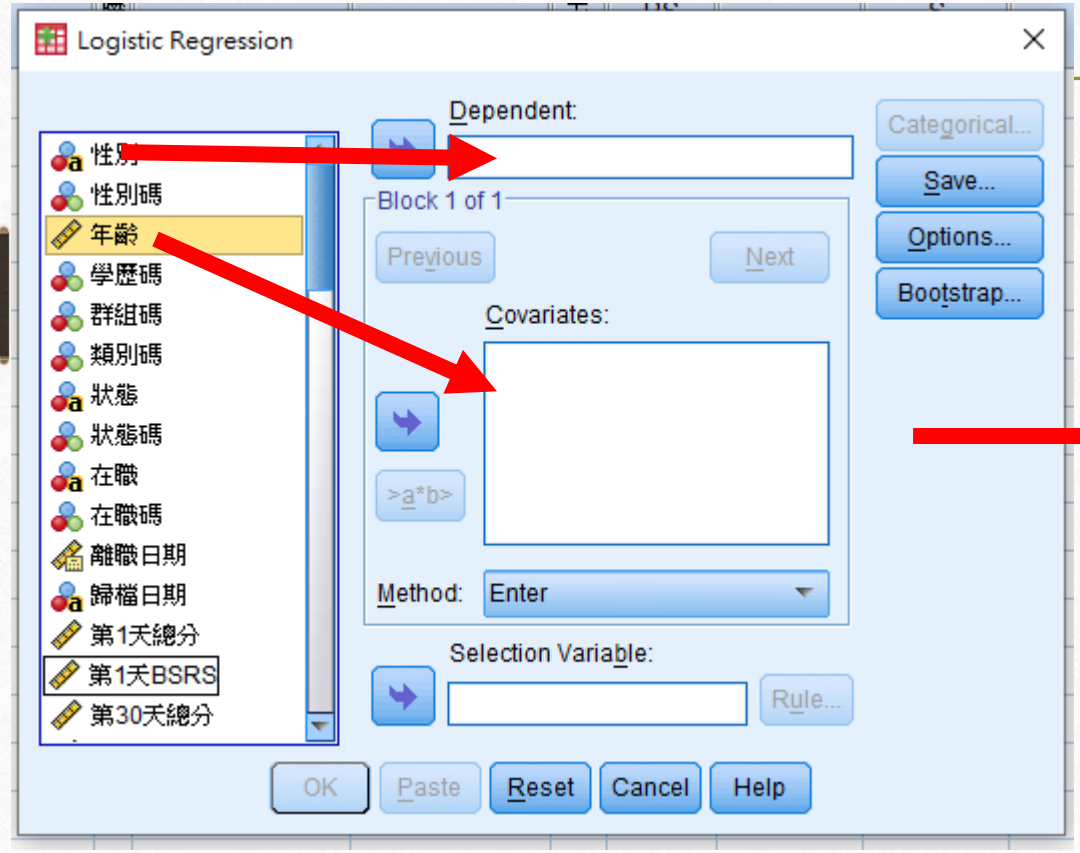
	年齡
Mann-Whitney U	14176.000
Wilcoxon W	367396.000
Z	-7.708
Asymp. Sig. (2-tailed)	.000

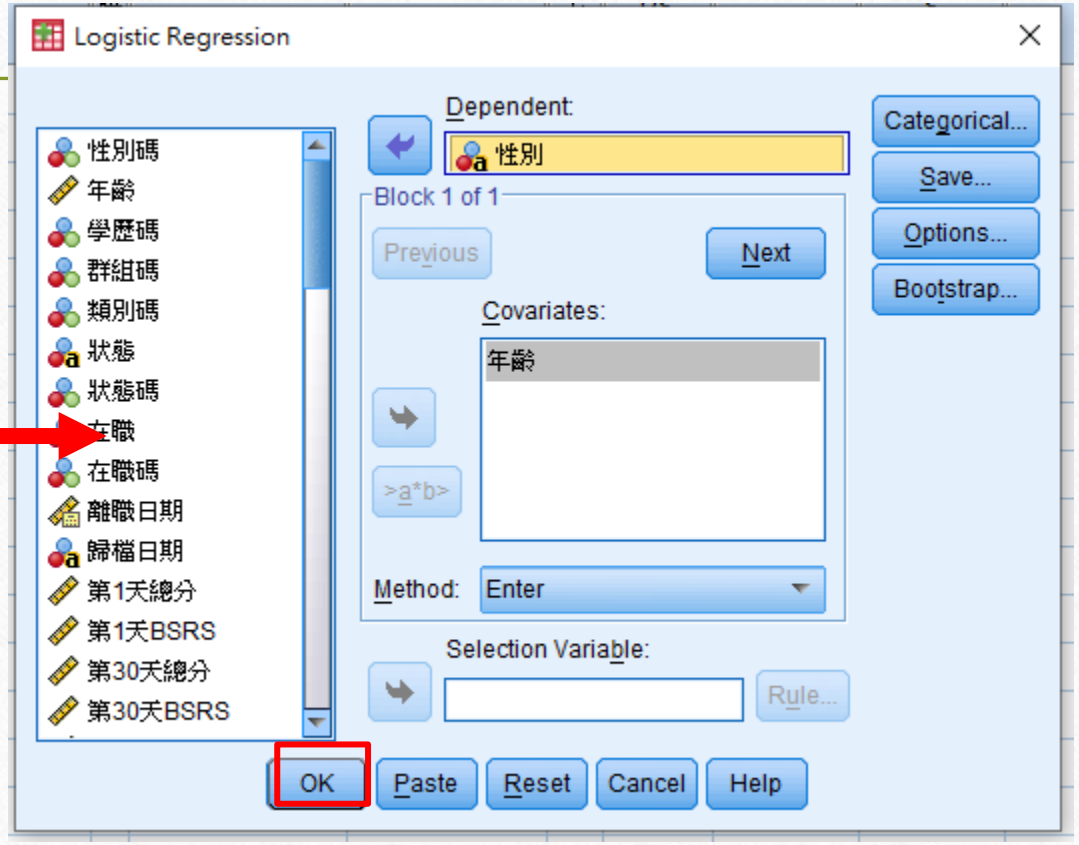
a. Grouping Variable: 性別碼

SPSS操作- Logistic regression



SPSS操作- Logistic regression





SPSS操作- Logistic regression

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	441.920[a]	.066	.154

a. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

Classification Table[a]

Observed			Predicted		
			性別		Percentage Correct
			女	男	
Step 1	性別	女	836	4	99.5
		男	72	0	.0
	Overall Percentage				91.7

a. The cut value is .500

Variables in the Equation

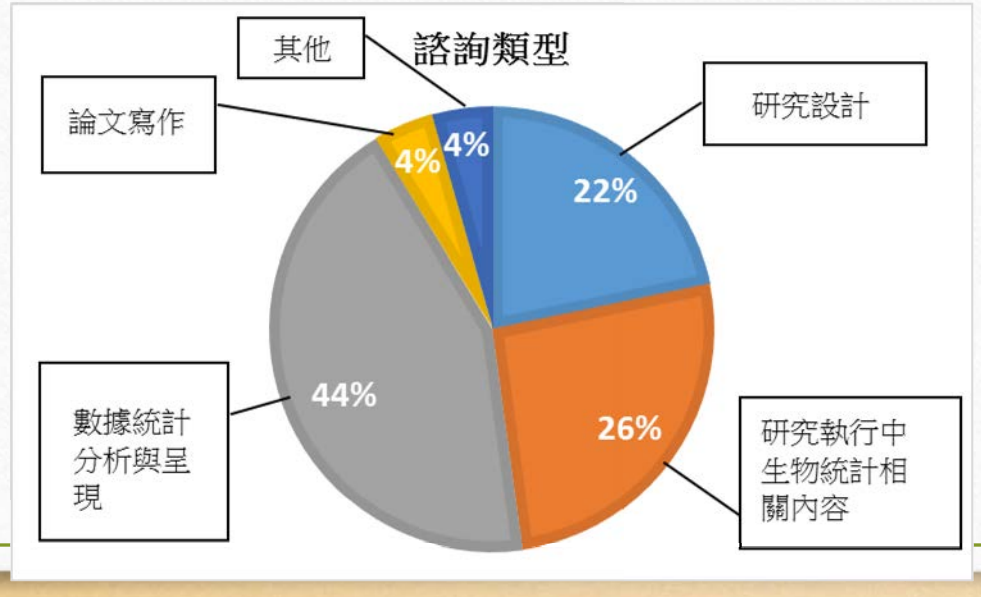
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	年齢	.672	.089	56.373	1	.000	1.958
	Constant	-17.274	2.024	72.834	1	.000	.000

a. Variable(s) entered on step 1: 年齢.

生物統計諮詢諮詢服務內容

- 諮詢服務

T檢定;卡方檢定;變異數分析(ANOVA) ; 存活分析; 無母數分析; 重複測量; 線性相關分析; 線性迴歸; Cox model ; Poisson regression; GEE ; 因素分析;問卷分析



生物統計諮詢服務對象

- 您的臨床研究曾經遇過統計相關的問題嗎？您的臨床研究在執行前，執行中，或執行後，曾經有「需要統計協助」的念頭嗎？如果答案是肯定的話，目前由研究部提供生物統計諮詢服務，負責提供院內同仁所需的生物統計諮詢服務，使您的研究過程更加順利！

佛教慈濟醫療財團法人
台北慈濟醫院
Taipei Tzu Chi Hospital,
Buddhist Tzu Chi Medical Foundation

感恩合十

靜思語~ 要用心，不要操心、煩心