



存活分析課程 (1)



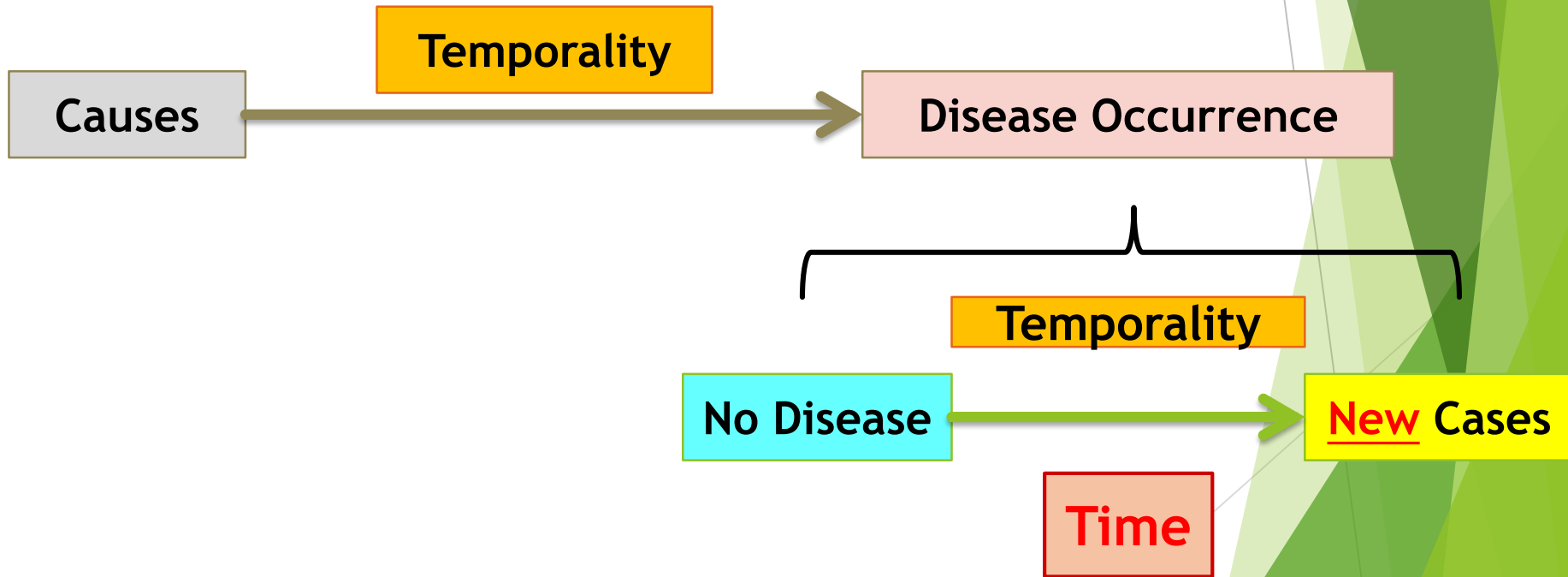
醫學研究部 生統小組 副研究員：陳韻仔 博士

授課日期：113年12月10日

世代研究：

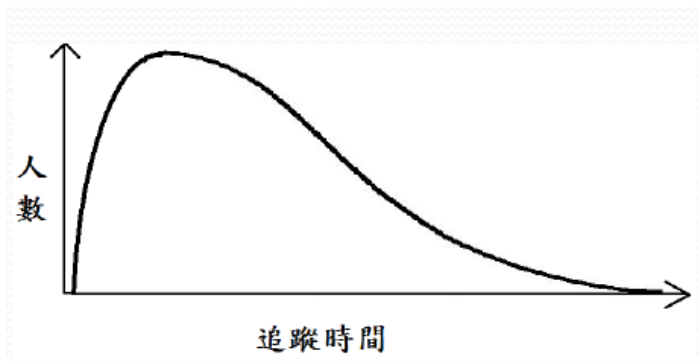
探討疾病的發生率及風險

*判定因果關係的必要條件之一



Survival Analysis

- 將『時間』變項列入分析的統計方法
- 從一時間點至事件(event)發生的時間(time to event)，稱為survival time
 - Start time- 研究起始時間/確診癌症時間
 - End time- 疾病發生時間/死亡時間
- 資料特性：資料通常不是常態分配



資料分類

- 完整資料(complete data)
 - 觀察期間提供事件發生的時間點
- 設限資料(censored data)
 - 觀察期間失去聯絡或觀察結束時仍未發生事件
- 競爭死因資料(Competing cause of deaths)
 - 觀察期間死於其他死因之時間

Time to Censor的定義

Time to event (TTE): 指從研究開始到感興趣事件（如疾病進展或死亡）發生的時間間隔。

Time to censor (TTC): 當感興趣的事件未發生時，用於記錄到參與者最後一次被觀察的時間。

1. 起始點 (Starting Point):

研究的起始時間，例如參與者入組的日期或治療開始的日期。

2. 終止點 (Ending Point):

參與者被觀察到的最後時間點，通常是以下情況之一：

1. 研究的結束日期。
2. 參與者退出或失訪的日期。
3. 參與者死亡，但其死亡原因與研究的主要事件（e.g. 因中風住院）無關。

3. 時間間隔 (Time Interval):

從起始點到終止點的時間長度，通常以天、月或年表示。

存活資料建檔

基本資料

存活狀態

起訖時間

分析整理

ID	Sex	Age	Tx	event (death)	Start_date	Death_date	follow_date	End_date	follow_year
Case1	0	45	0	0	2012/5/8		2016/7/15	2016/7/15	4.19
Case2	1	55	0	1	2013/12/9	2015/1/16		2015/1/16	1.10
Case3	0	56	0	0	2012/5/10		2014/3/12	2014/3/12	1.84
Case4	1	51	1	1	2014/9/11	2016/7/18		2016/7/18	1.85
Case5	0	62	1	1	2012/8/12	2016/12/19		2016/12/19	4.35
Case6	1	70	0	1	2018/7/13	2019/7/20		2019/7/20	1.02
Case7	1	58	0	0	2015/5/14		2016/8/21	2016/8/21	1.27
Case8	0	66	0	0	2018/8/15		2019/7/22	2019/7/22	0.93
Case9	0	60	1	0	2019/5/16		2019/7/23	2019/7/23	0.19
Case10	0	63	1	0	2017/10/17		2018/7/24	2018/7/24	0.77
Case11	0	66	1	0	2016/3/20		2017/7/25	2017/7/25	1.35
Case12	0	69	1	0	2014/8/22		2016/7/26	2016/7/26	1.93

- 日期格式統一西元年
- 可分組比較存活曲線差異，如Sex (F vs M), Age (<60 vs ≥60)
- 事件(event): 0=存活; 1=死亡
- 未死亡個案End_date，研究者需設定結束時間(建議可用最後看診日期)。

Cox Model v.s Logistic Model

Logistic Regression

- 依變項為類別變數(0 or 1)
- 沒有時間變項
- 使用 Odds Ratio (OR)估計

Cox Regression

- 依變項為時間×事件
- 加入追蹤時間及設限資料
- 使用 Hazard Ratio (HR)估計

Time to event (TTE): 指從研究開始到感興趣事件（如疾病進展或死亡）發生的時間間隔。

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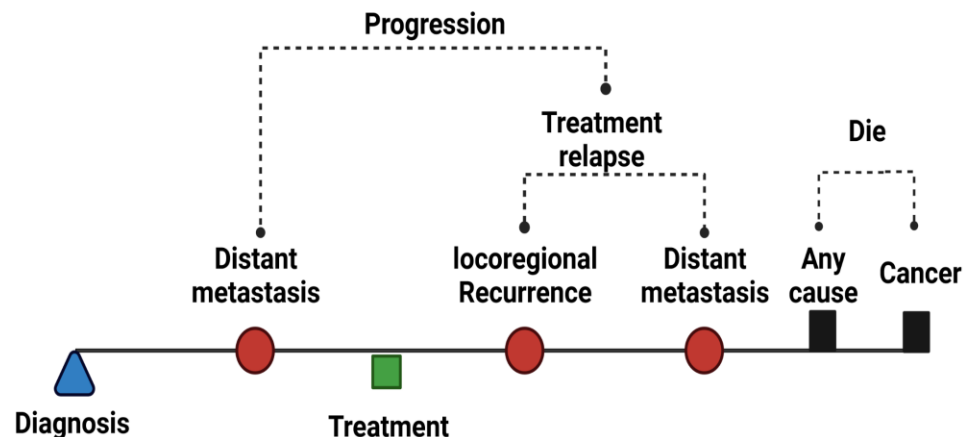
Definition of Time to Event Variables

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Time to censor (TTC): 當感興趣的事件未發生時，用於記錄到參與者最後一次被觀察的時間。

指標	事件	設限
1.無疾病進展存活期 (progression free survival, PFS)	疾病進展或死亡	無疾病進展
2.無疾病存活期 (disease free survival, DFS)	疾病復發或死亡	無疾病復發
3.治療至疾病進展時間 (time to progression, TTP)	疾病進展	無疾病進展、無疾病狀態死亡(如車禍或不明原因)
4.治療至治療失敗時間 (time to treatment failure, TTF)	疾病進展、疾病復發、藥物副作用、死亡	無疾病進展或復發
5.總存活時間 (overall survival, OS)	死亡	存活
6. 疾病特定存活期 (disease specific survival, DSS)	由疾病本身所導致的死亡(車禍或其他原因要歸為設限資料)	存活、因其他原因死亡

Definition for the Assessment of Time-to-event Endpoints in Cancer



Time to progress

The time from diagnosis/treatment to the progression of tumor (in any aspect).

Progression-free survival

The time from diagnosis/treatment to the progression of tumor (in any aspect) or death (for any cause).

Progression-free interval

The time from treatment to locoregional recurrence.

Relapse-free survival

The time from treatment to the relapse (local, regional, distant).

Recurrence-free survival

The time from treatment to locoregional recurrence or death (for any cause)

Disease-free survival

The time from treatment to locoregional recurrence, metastasis or death (for any reason)

Overall survival

The time from diagnosis/treatment to death (for any reason).

Disease-specific survival

The time from diagnosis/treatment to death (cancer-specific).

TTP

PFS

PFI

RpFS

RFS

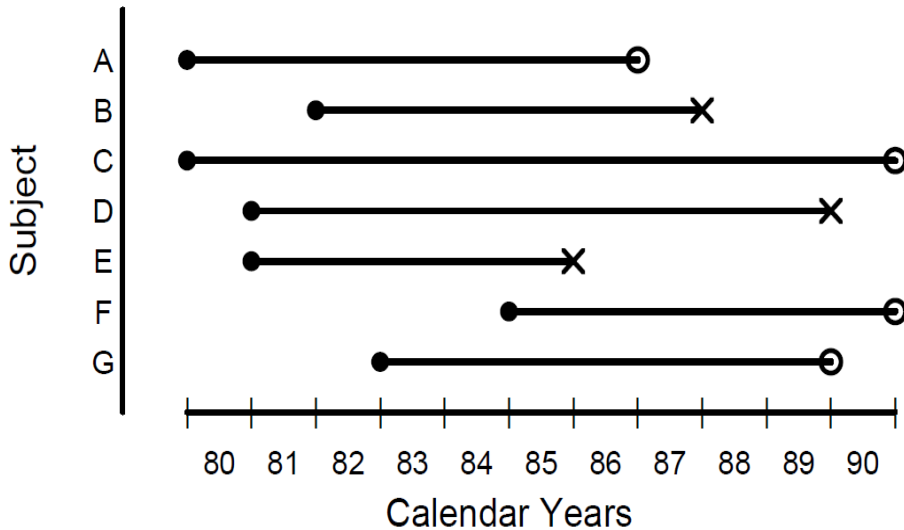
DFS

OS

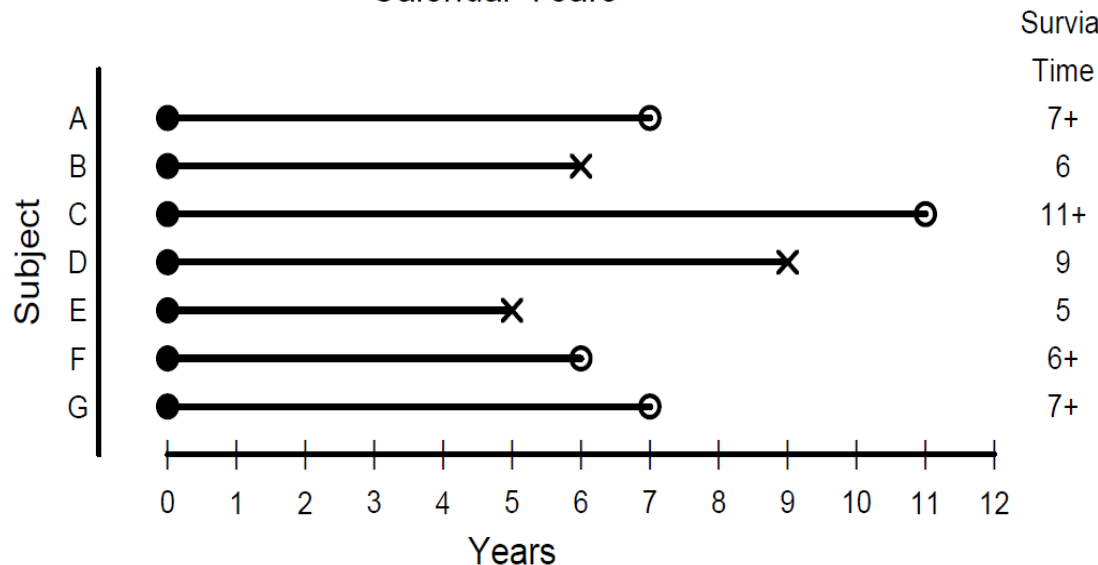
DSS

Survival time

(● initial follow-up, × death, ○ alive.)



- Survival time= 事件發生時間 - 追蹤的起始時間 (需大於0)
- 個案BDE是完整資料；個案ACFG為設限資料



存活分析－統計方法

2.2. Statistical Analysis

The most important censored point of this study was the first episode of UBR. UBR-free survival was defined as the interval between the date of NUx and the date of the first episode of UBR. Survival data was analyzed using both the Kaplan–Meier method and the logrank test. Univariate and multivariate analyses by Cox's proportional hazards model were used to determine the relevance between each of the clinicopathological factors and UBR. P-values less than 0.05 were defined as statistically significant. All statistical analyses were performed with SPSS (Statistical Package for the Social Sciences, version 22.0, IBM, NY, USA).

Chen, Chuan-Shu, et al. *Diagnostics* 10.4 (2020): 201.

存活分析－統計方法

- 無母數分析方法 (Non-parametric Methods)

- － 繪製存活曲線

- Kaplan-Meier method

- － 比較存活曲線的差異

- Log-rank test

- Wilcoxon test

適合：
初步探索和分組比較

- 半母數方法 (Semi-parametric Methods)

- － 分析風險比 (HR: hazard ratio)

- Cox Proportional Hazards Model

適合：
多變量調整或風險比估計

存活分析－統計方法

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適合：
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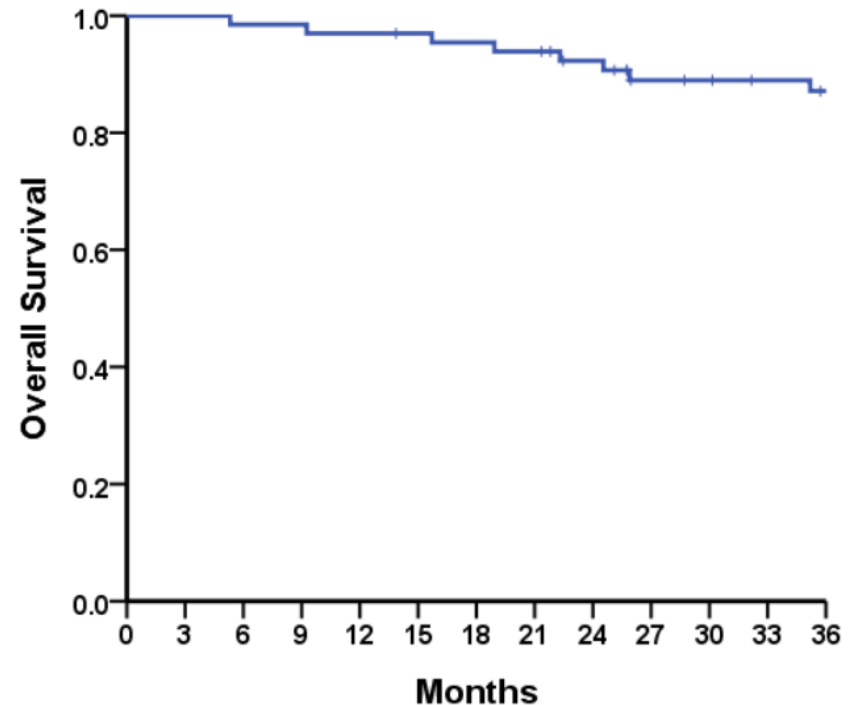
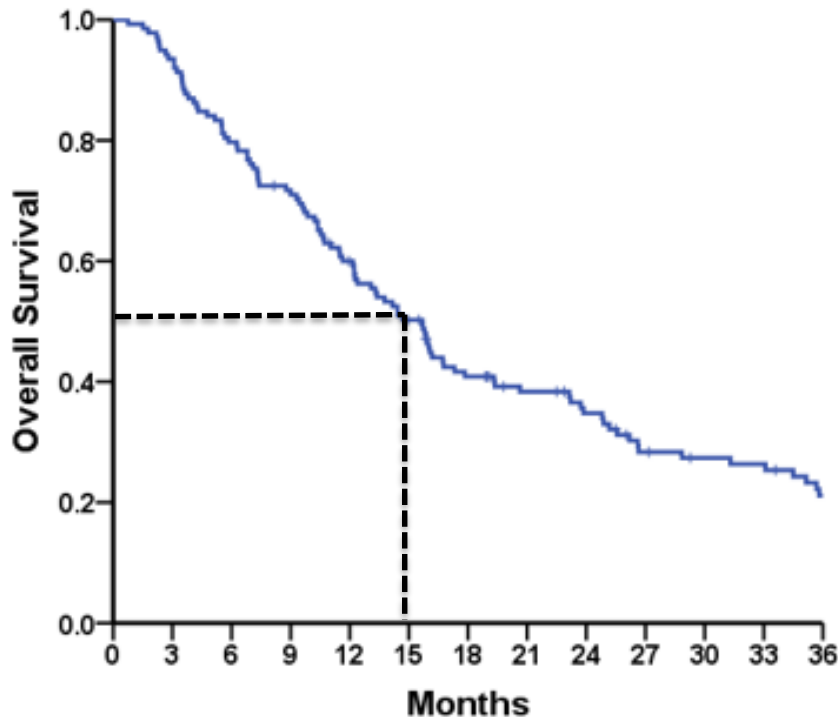
- 半母數方法 (Semi-parametric Methods)

- － 分析風險比 (HR: hazard ratio)

- Cox Proportional Hazards Model

Kaplan-Meier Method

- 常用來估計存活曲線的方法，此方法用每一個事件發生時間點及設限點來設定區間
- 可估計存活中位數及不同時間點的存活率



Kaplan-Meier Estimates



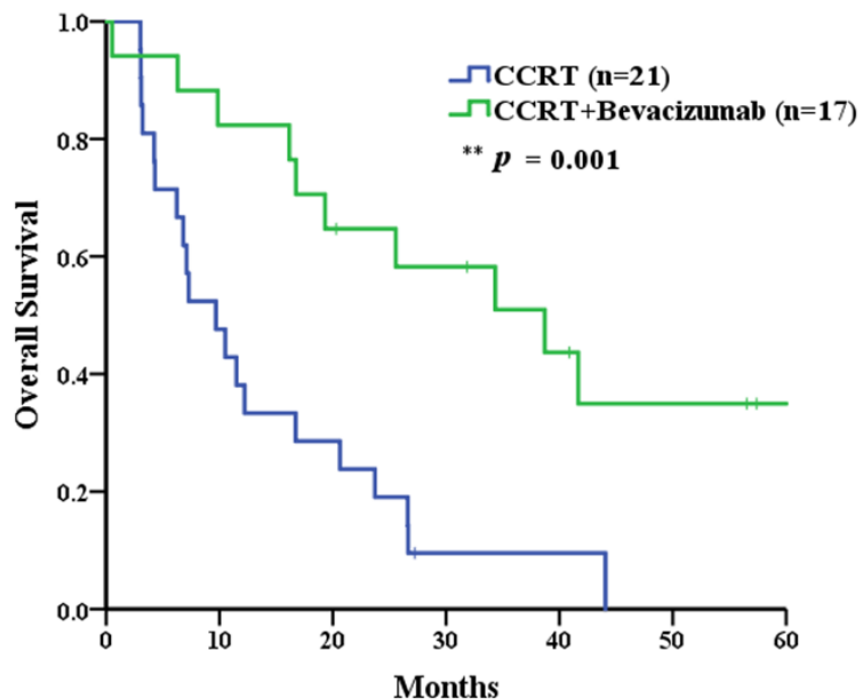
ID	fu_time (month)	status
1	2	0
2	2	0
3	2	1
4	3	0
5	3	0
6	4	1
7	4	0
8	5	0
9	6	1
10	6	0

month	Number at risk	Number of events	Number of censored	Conditional Probability	Survival Function
1	10	0	0	$10/10 = 1.00$	1.00
2	10	1	2	$9/10 = 0.90$	$0.90 \times 1.00 = 0.90$
3	7	0	2	$7/7 = 1.00$	$1.00 \times 0.90 = 0.90$
4	5	1	1	$4/5 = 0.80$	$0.80 \times 0.90 = 0.72$
5	3	0	1	$3/3 = 1.00$	$1.00 \times 0.72 = 0.72$
6	2	1	1	$1/2 = 0.50$	$0.50 \times 0.72 = 0.36$

Log-rank Test



- Kaplan-Meier法僅能了解不同組別的存活曲線分佈
- 比較組別間是否差異
 - H0: 兩條存活曲線相同
 - H1: 兩條存活曲線不相同



Kaplan-Meier Example



- 比較在第三期子宮內膜癌術後治療，Sandwich組和CT alone兩組治療預後的差異

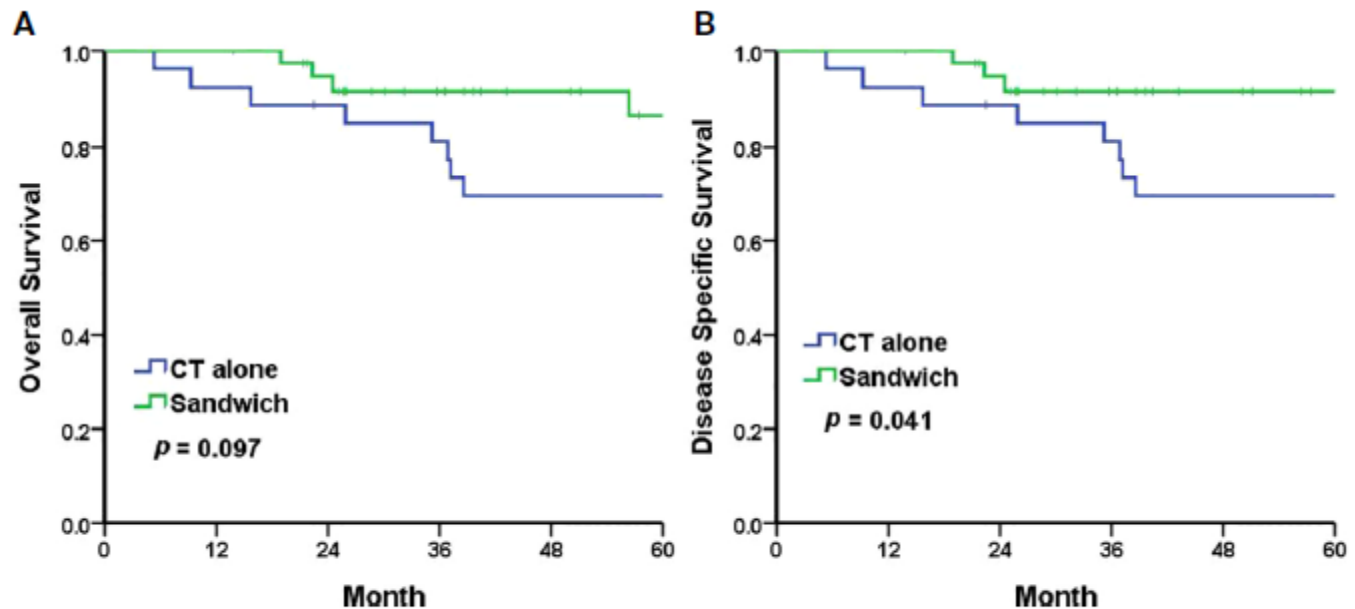


FIGURE 2
The Kaplan–Meier survival curves for 5-year overall survival (A) and 5-year disease-specific survival (B). CT chemotherapy.

Outcomes of "sandwich" chemoradiotherapy compared with chemotherapy alone for the adjuvant treatment of FIGO stage III endometrial cancer. *Frontiers in oncology*, 12 (2022), 946113-946113.

Log-rank Test

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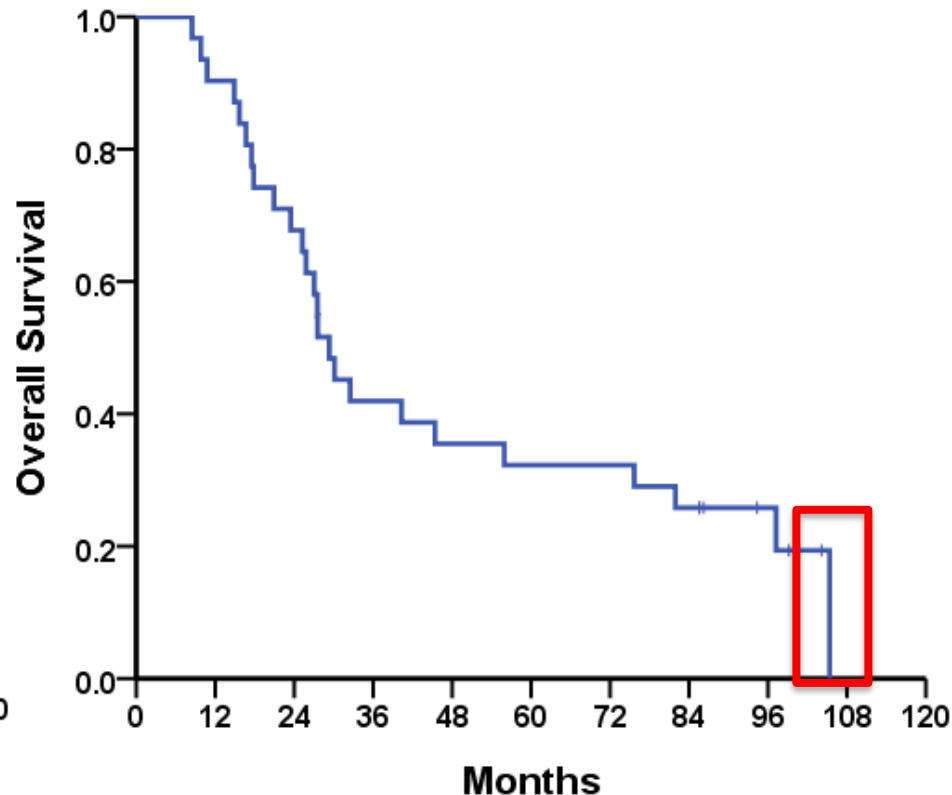
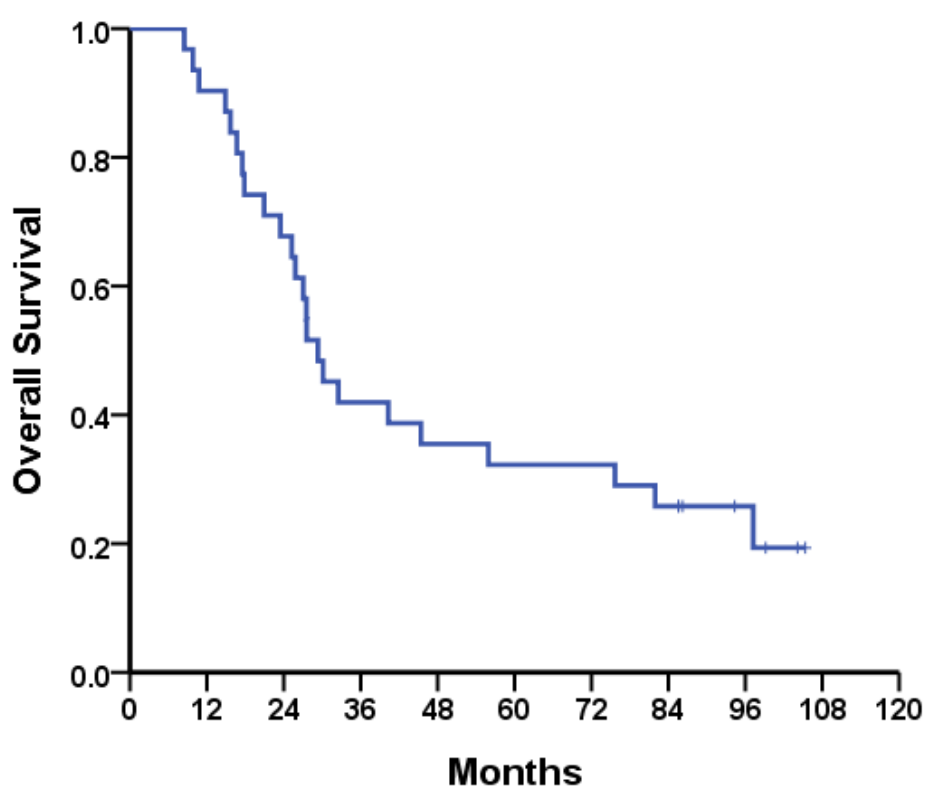
Methods	權重分配	敏感區間	適用情境
Log-rank test	均等權重	整個研究期間	適合比例風險假設成立；整體差異分析
Wilcoxon Test (Breslow Test)	對 <u>早期事件</u> 賦予較高權重	研究早期	適合早期事件差異顯著或比例風險假設可能不完全成立

兩條存活曲線相交不可使用！

Survival Curve



Time to event 和 censor 的不同，會造成存活曲線有差異



Survival Curve

Time to event 和 censor 的不同，會造成存活曲線有差異



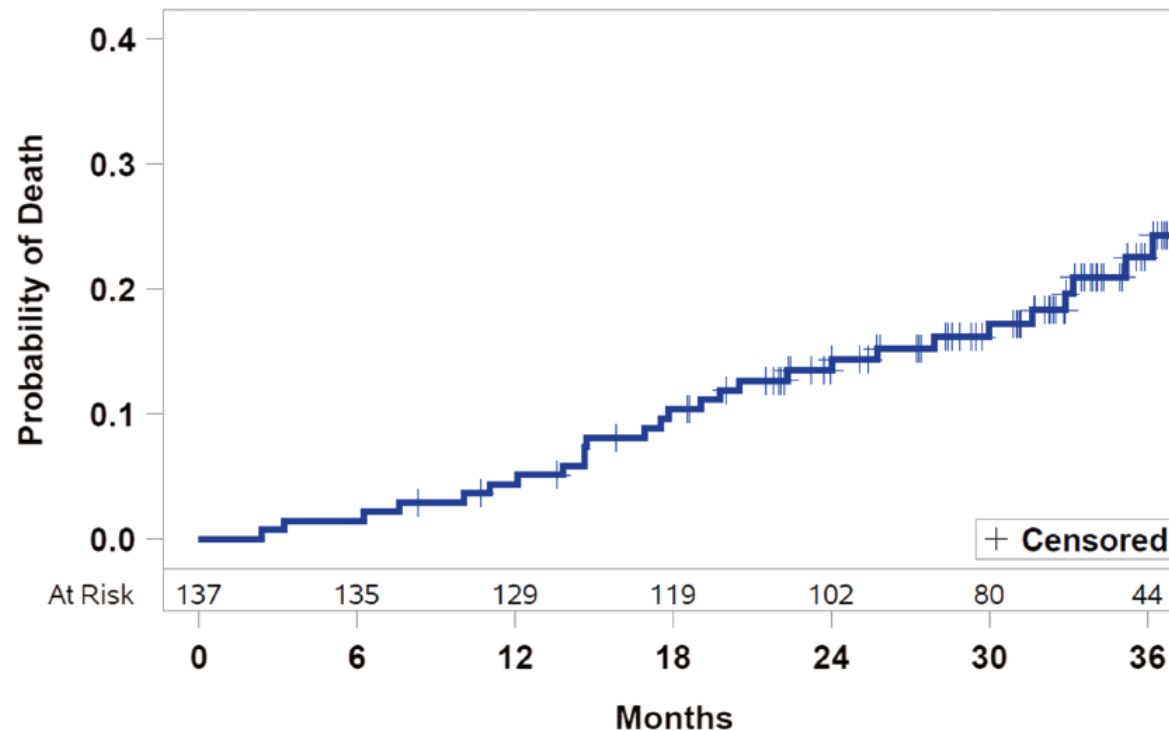
Survival Table

	Time	Status	Cumulative Proportion Surviving at the Time		N of Cumulative Events	N of Remaining Cases
			Estimate	Std. Error		
1	8.467	Death	.968	.032	1	30
2	9.833	Death	.935	.044	2	29
3	10.767	Death	.903	.053	3	28
4	14.900	Death	.871	.060	4	27
5	15.667	Death	.839	.066	5	26
6	16.667	Death	.806	.071	6	25
7	17.533	Death	.774	.075	7	24
8	17.833	Death	.742	.079	8	23
9	20.933	Death	.710	.082	9	22
10	23.467	Death	.677	.084	10	21
11	25.233	Death	.645	.086	11	20
12	25.800	Death	.613	.087	12	19
13	27.033	Death	.581	.089	13	18
14	27.533	Death	.548	.089	14	17
15	27.567	Death	.516	.090	15	16
16	29.333	Death	.484	.090	16	15
17	30.133	Death	.452	.089	17	14
18	32.500	Death	.419	.089	18	13
19	40.300	Death	.387	.087	19	12
20	45.400	Death	.355	.086	20	11
21	55.933	Death	.323	.084	21	10
22	75.667	Death	.290	.082	22	9
23	81.933	Death	.258	.079	23	8
24	85.567	Survival	.	.	23	7
25	85.600	Survival	.	.	23	6
26	86.233	Survival	.	.	23	5
27	94.333	Survival	.	.	23	4
28	97.233	Death	.194	.081	24	3
29	99.167	Survival	.	.	24	2
30	104.167	Survival	.	.	24	1
31	105.367	Survival	.	.	24	0

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Presentation of Survival Curve



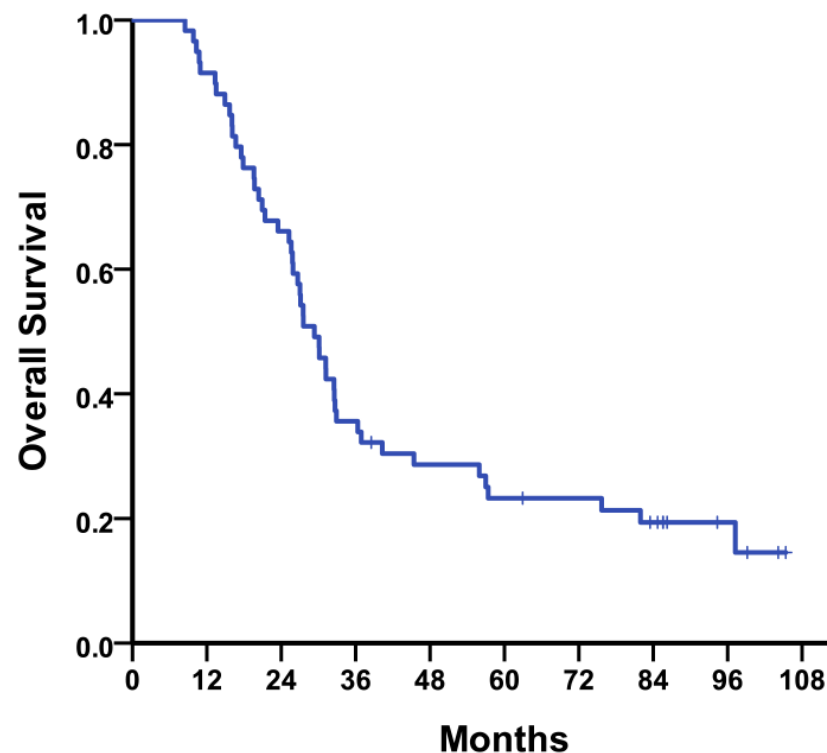
Months represent months from the date of therapy activation.

Figure 5. Kaplan–Meier curve of mortality. Kaplan–Meier curve showing estimated mortality through 36 months of active therapy using the pooled treatment and former control groups. Patients who did not die were censored at last contact if they did not reach 36 months of active therapy.

Presentation of Survival Curve



存活曲線特定時間點的Number at risk



Survival Table

	Time	Status	Cumulative Proportion Surviving at the Time		N of Cumulative Events	N of Remaining Cases
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1	8.467	Death	.968	.032	1	30
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30	104.167	Survival	.	.	24	1
31	105.367	Survival	.	.	24	0

No. at risk

31 28 21 13 11 10 10 8 4 0

存活分析－統計方法

- 無母數分析方法 (Non-parametric Methods)

- － 繪製存活曲線

- Kaplan-Meier method

- － 比較存活曲線的差異

- Log-rank test

- Wilcoxon test

- 半母數方法 (Semi-parametric Methods)

- － 分析風險比 (HR: hazard ratio)

- Cox Proportional Hazards Model

適合：

多變量調整或風險比估計

Cox Proportional Hazards Model

- 評估多個變數對存活(Time to event)的影響
- 可使用類別/連續變數呈現危險因子，並估算出這些危險因子對outcome的影響

$$\log \frac{h(t)}{h_0(t)} = \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_k x_k$$

Hazard ratio (HR)	Explanation
HR=1	Two groups have the same survival experience
HR>1	Survival is better in the control group
HR<1	Survival is better in the treatment group

Cox Regression Example



5-year disease-specific survival

	Univariate			Multivariable		
	HR	95% CI	p-value	HR	95% CI	p-value
Age group						
<60	Reference					
≥60	1.34	(0.36-5.07)	0.665			
FIGO stage						
IIIA and IIIB and IIIC1	Reference					
IIIC2	1.45	(0.44-4.75)	0.541			
Histology grading						
Grades 1 and 2	Reference			Reference		
Grade 3	8.70	(1.11-68.01)	0.039*	9.16	(1.17-71.70)	0.035*
Treatment						
CT alone	Reference			Reference		
Sandwich	0.27	(0.07-1.04)	0.056	0.23	(0.06-0.87)	0.030*
LVSI						
Absent	Reference					
Present	3.82	(0.49-29.89)	0.201			
Deep myometrial invasion						
Absent	Reference			Reference		
Present	7.85	(1.00-61.34)	0.050	9.44	(1.20-74.15)	0.033*

Outcomes of "sandwich" chemoradiotherapy compared with chemotherapy alone for the adjuvant treatment of FIGO stage III endometrial cancer. *Frontiers in oncology*, 12 (2022) , 946113-946113.

KM and Cox Regression SPSS dataset

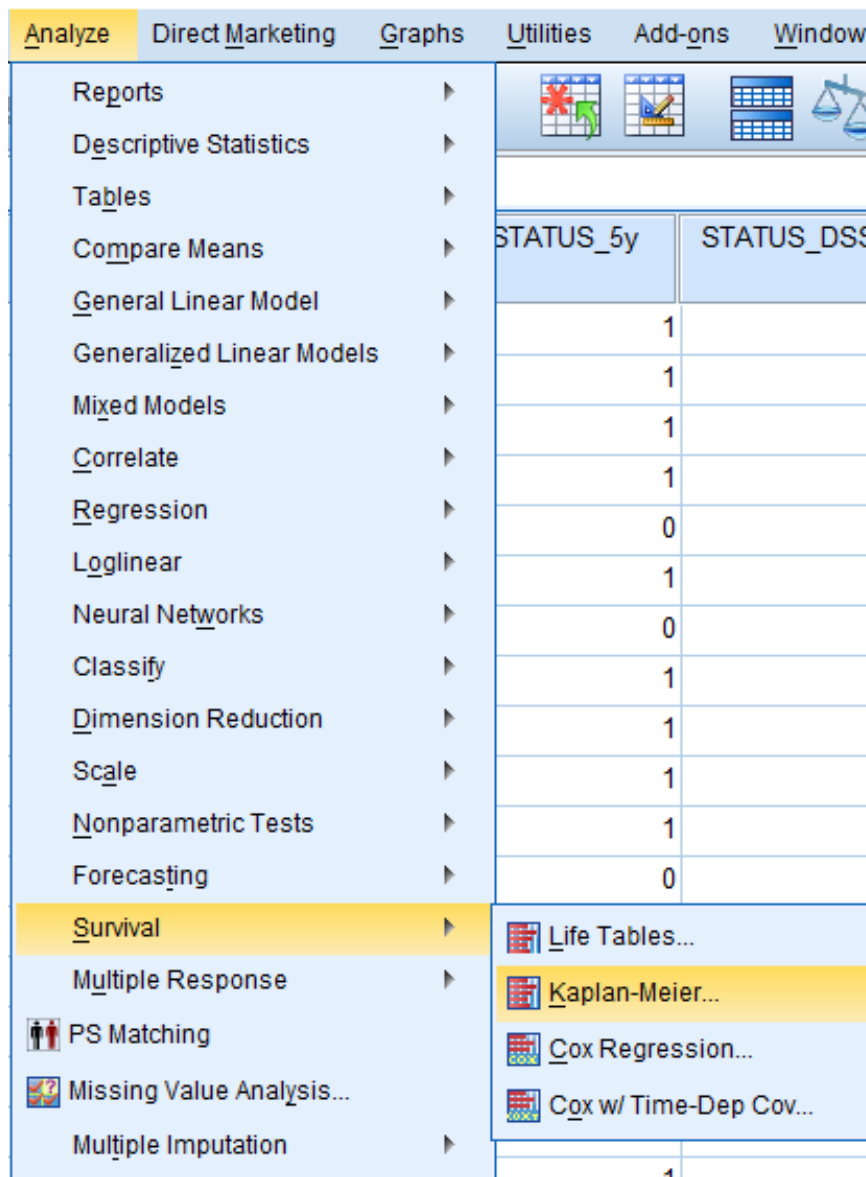


ID	group	OP_date	End_Date	STATUS_5y	STATUS_DSS_5y	Month_OS	Age_gp	Hist_grading
1	1	2016/04/20	2021/09/09	1	0	64.66	0	2
2	1	2012/04/27	2020/02/20	1	0	93.80	1	1
3	1	2015/12/30	2021/01/19	1	0	60.68	0	1
4	0	2010/11/12	2016/04/02	1	0	64.66	0	2
5	1	2012/11/21	2014/10/01	0	1	22.31	0	2
6	1	2013/10/08	2020/02/12	1	0	76.16	0	1
7	0	2006/03/29	2008/05/25	0	1	25.89	0	1
8	1	2012/06/19	2020/12/23	1	0	102.14	1	2
9	1	2018/10/29	2021/10/20	1	0	35.71	1	1
10	1	2019/08/27	2021/10/18	1	0	25.72	0	2
11	0	2010/02/05	2017/11/24	1	0	93.60	0	2
12	0	2011/02/24	2014/05/14	0	1	38.60	0	2
13	1	2017/08/25	2021/01/05	1	0	40.38	1	1
14	1	2012/04/20	2015/07/10	1	0	38.64	0	2
15	0	2005/10/06	2015/02/18	1	0	112.43	0	2
16	1	2018/06/25	2021/10/14	1	0	39.66	0	2
17	1	2015/04/08	2021/09/28	1	0	77.70	1	1
18	1	2014/10/17	2021/10/27	1	0	84.34	0	1
19	0	2012/08/03	2013/05/12	0	1	9.26	0	2
20	1	2013/01/14	2017/09/26	0	0	56.38	0	2

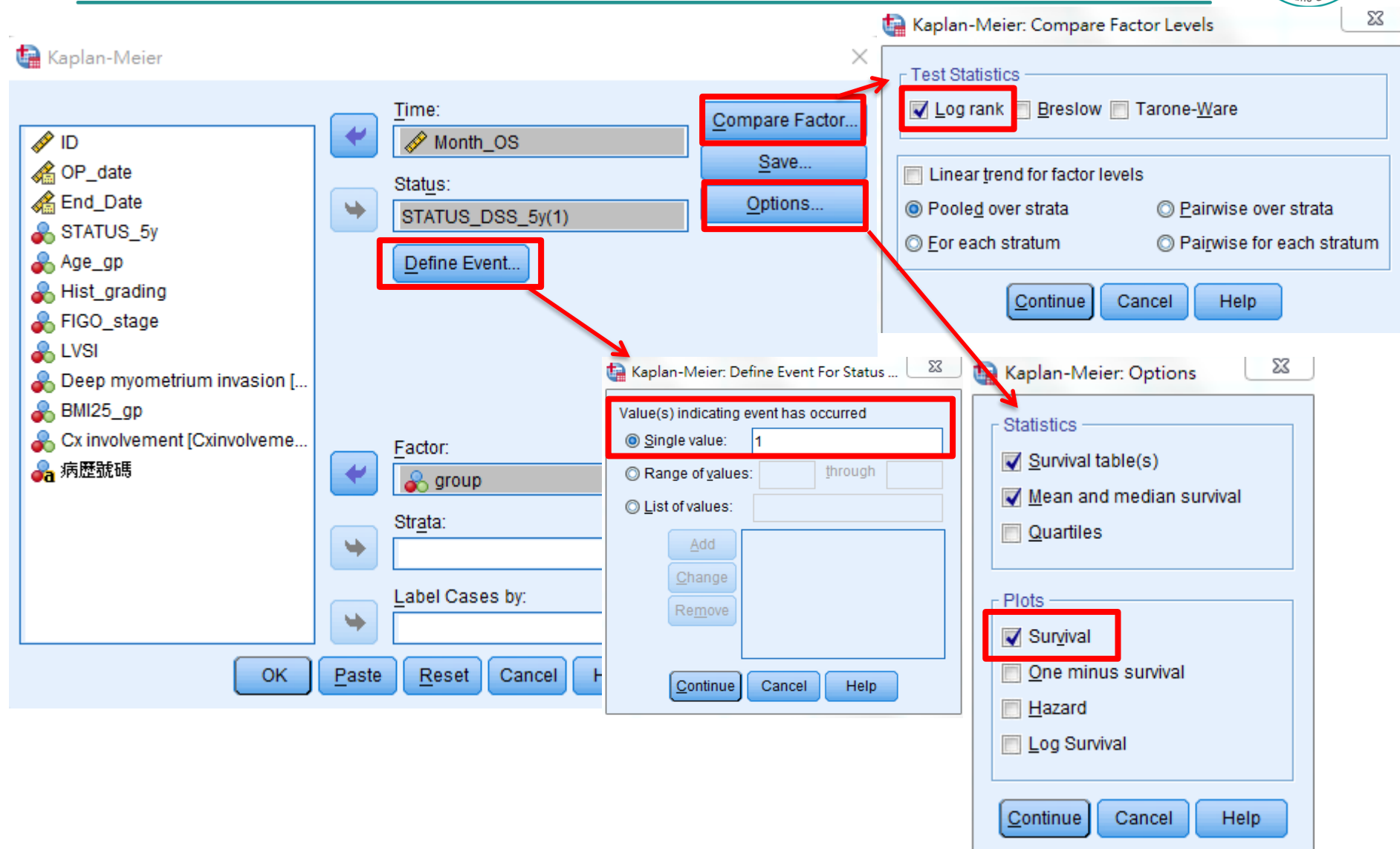
Kaplan-Meier 分析操作



分析>存活分析
>Kaplan-Meier 統計



Kaplan-Meier 分析操作



The image shows the SPSS Kaplan-Meier analysis workflow with three dialog boxes and their options:

- Kaplan-Meier (Main Dialog):**
 - Time:** Month_OS
 - Status:** STATUS_DSS_5y(1)
 - Define Event...** (Annotated with a red box)
 - Factor:** group
 - Strata:** (Empty)
 - Label Cases by:** (Empty)
- Kaplan-Meier: Define Event For Status ... (Annotated with a red box):**
 - Value(s) indicating event has occurred:**
 - ☒ Single value: 1
 - ☐ Range of values: through
 - ☐ List of values:
 - Buttons: Add, Change, Remove, Continue, Cancel, Help
- Kaplan-Meier: Compare Factor Levels (Annotated with a red box):**
 - Test Statistics:**
 - ☒ Log rank
 - ☐ Breslow
 - ☐ Tarone-Ware
 - ☐ Linear trend for factor levels
 - ☒ Pooled over strata
 - ☐ Pairwise over strata
 - ☐ For each stratum
 - ☐ Pairwise for each stratum
 - Buttons: Continue, Cancel, Help
- Kaplan-Meier: Options (Annotated with a red box):**
 - Statistics:**
 - ☒ Survival table(s)
 - ☒ Mean and median survival
 - ☐ Quartiles
 - Plots:**
 - ☒ Survival
 - ☐ One minus survival
 - ☐ Hazard
 - ☐ Log Survival
 - Buttons: Continue, Cancel, Help

Kaplan-Meier Output



Case Processing Summary

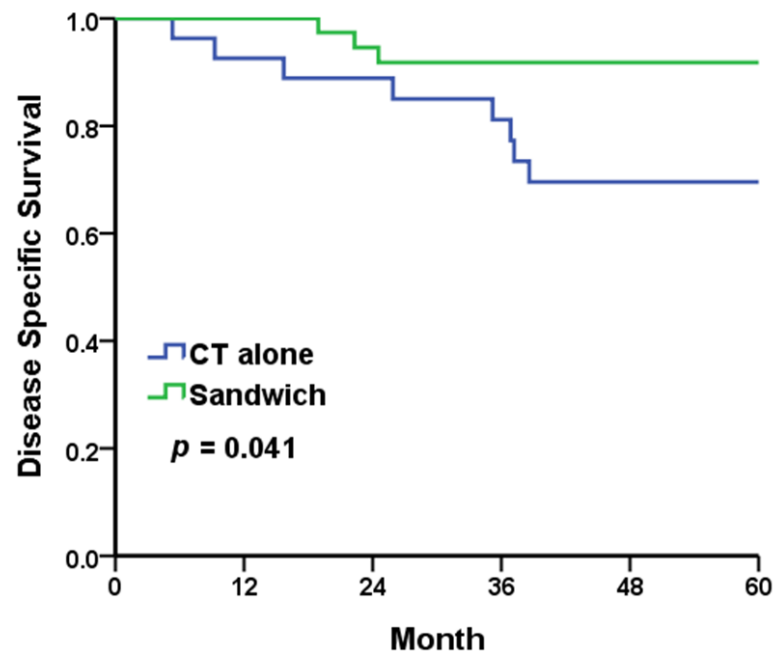
group	Total N	N of Events	Censored	
			N	Percent
CT alone	27	8	19	70.4%
Sandwich	39	3	36	92.3%
Overall	66	11	55	83.3%

Disease specific survival

	Total	DSS	Censored		Survival rate (%)			p for log rank
			n	%	1y	3y	5y	
Treatment								0.041
CT alone	27	8	19	70.4%	92.6%	81.2%	69.6%	
Sandwich	39	3	36	92.3%	100.0%	97.4%	91.8%	

Survival Table

group		Time	Status	Cumulative Proportion Surviving at the Time		N of Cumulative Events	N of Remaining Cases
				Estimate	Std. Error		
CT alone	1	5.322	DSS	.963	.036	1	26
	2	9.265	DSS	.926	.050	2	25
	3	15.704	DSS	.889	.060	3	24
	4	22.472	no-DSS	.	.	3	23
	5	25.889	DSS	.850	.069	4	22
	6	35.187	DSS	.812	.076	5	21
	7	36.862	DSS	.773	.082	6	20
	8	37.191	DSS	.734	.086	7	19
	9	38.604	DSS	.696	.090	8	18
	10	63.639	no-DSS	.	.	8	17
	11	64.526	no-DSS	.	.	8	16
	12	64.657	no-DSS	.	.	8	15
	13	72.279	no-DSS	.	.	8	14
	14	85.290	no-DSS	.	.	8	13
	15	89.823	no-DSS	.	.	8	12



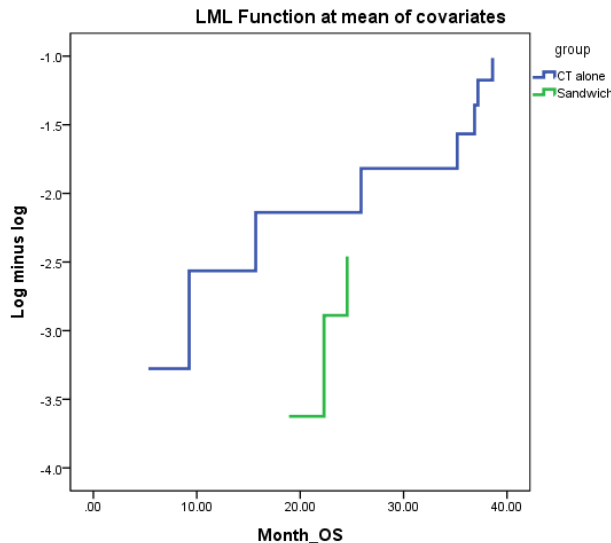
Overall Comparisons

	Chi-Square	df	Sig.
Log Rank (Mantel-Cox)	4.169	1	.041

Test of equality of survival distributions for the different levels of group.

Cox PH assumption

- 透過Cox model 中 **log minus log (LML)** 圖形判定是否符合假設
 - 交叉代表未符合
 - 平行代表符合
- 在Cox model加入time-dependent變數的交互作用項判定是否符合假設
 - 顯著代表未符合
 - 未顯著代表符合



Variables in the Equation

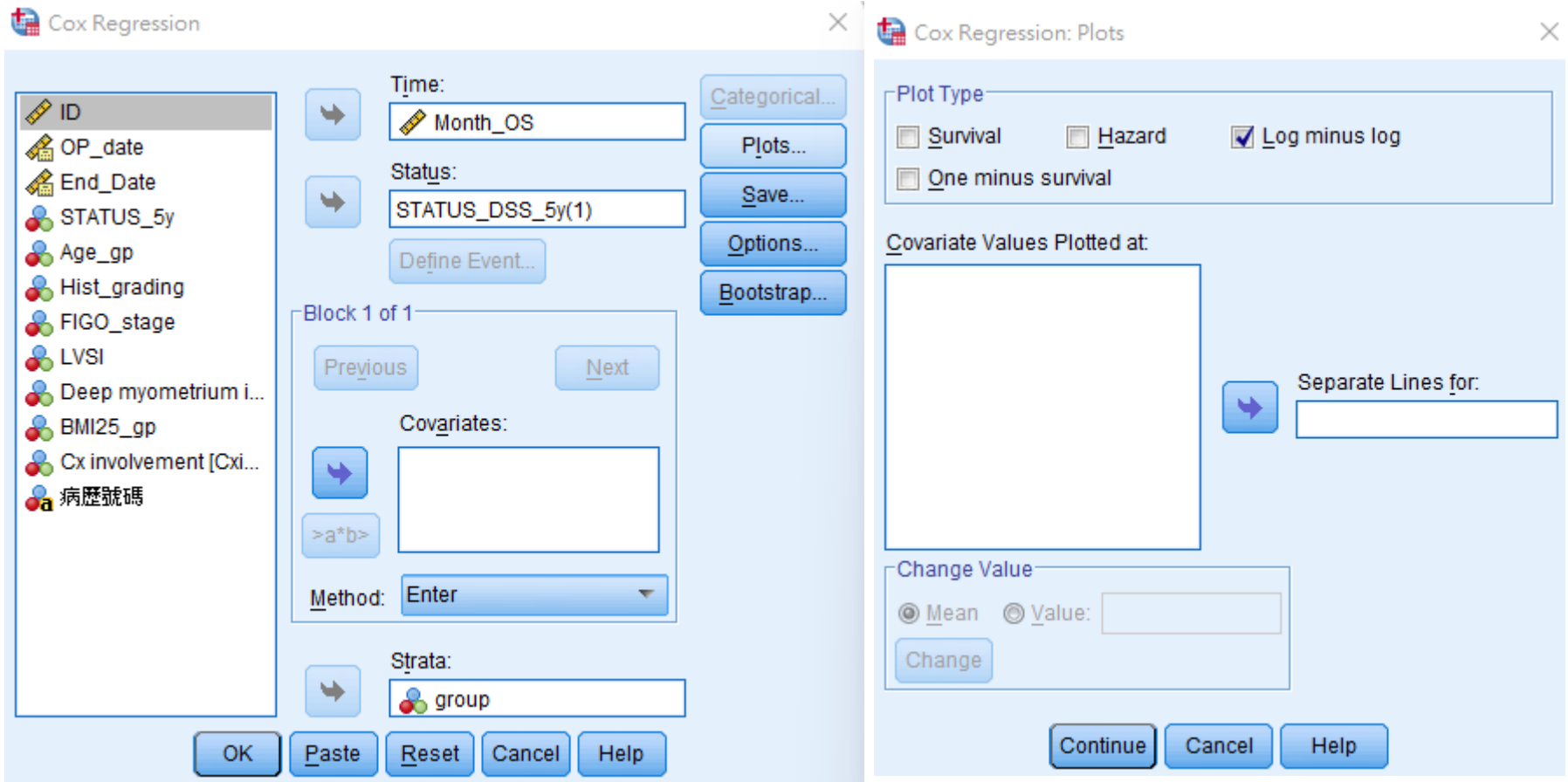
	B	SE	Wald	df	Sig.	Exp(B)
T_COV_	-.022	.062	.120	1	.729	.979
group	-.786	1.581	.247	1	.619	.456

- 方法：
 - 將一個基線變數（如 `group`）與時間（`time`）相乘生成交互項（例如 `group*time`）。
 - 將此交互項納入 Cox 模型，然後檢驗其顯著性。
- 交互項公式：

$$h(t) = h_0(t) \cdot \exp(\beta_1 \cdot \text{group} + \beta_2 \cdot \text{group} \cdot \text{time})$$

Cox PH assumption

- Log minus log (LML) 圖形



The image displays two SPSS dialog boxes for Cox Regression analysis. The left box, 'Cox Regression', shows the 'Time' variable as 'Month_OS' and the 'Status' variable as 'STATUS_DSS_5y(1)'. The 'Covariates' list is empty, and the 'Method' is set to 'Enter'. The 'Strata' variable is 'group'. The right box, 'Cox Regression: Plots', shows the 'Plot Type' as 'Log minus log' (checked). The 'Covariate Values Plotted at' area is empty, and the 'Separate Lines for' field is also empty. The 'Change Value' section shows 'Mean' selected and 'Value' set to 1.0. Both boxes have 'Continue', 'Cancel', and 'Help' buttons at the bottom.

Cox Regression

Time: Month_OS

Status: STATUS_DSS_5y(1)

Block 1 of 1

Previous Next

Covariates:

Method: Enter

Strata: group

Cox Regression: Plots

Plot Type

☐ Survival ☐ Hazard ☒ Log minus log

☐ One minus survival

Covariate Values Plotted at:

Separate Lines for:

Change Value

☒ Mean ☐ Value: 1.0

Change

Cox PH assumption

- Cox time-dependent變數的交互作用項

Analyze Direct Marketing Graphs Utilities Add-ons Window

Reports

Descriptive Statistics

Tables

Compare Means

General Linear Model

Generalized Linear Models

Mixed Models

Correlate

Regression

Loglinear

Neural Networks

Classify

Dimension Reduction

Scale

Nonparametric Tests

Forecasting

Survival

Multiple Response

PS Matching

Missing Value Analysis...

Multiple Imputation

STATUS_5y STATUS_DSS

1

1

1

1

1

0

1

0

1

1

1

1

1

0

Life Tables...

Kaplan-Meier...

Cox Regression...

Cox w/ Time-Dep Cov...

1

Compute Time-Dependent Covariate

Expression for T_COV_:

T_ * group

Function group:

Model...

Cox Regression

T_COV_ [T_COV_]

ID

group

OP_date

End_Date

STATUS_5y

Age_gp

Hist_grading

FIGO_stage

LVS1

Deep myometrium i...

BMI25_gp

Cx involvement [Cxi...

病歷號碼

Time:

Month_OS

Status:

STATUS_DSS_5y(1)

Define Event...

Categorical...

Save...

Options...

Cox Regression: Define Categorical Covariates

Covariates:

T_COV_ [T_COV_]

Categorical Covariates:

group(Indicator(first))

Change Contrast

Contrast: Indicator

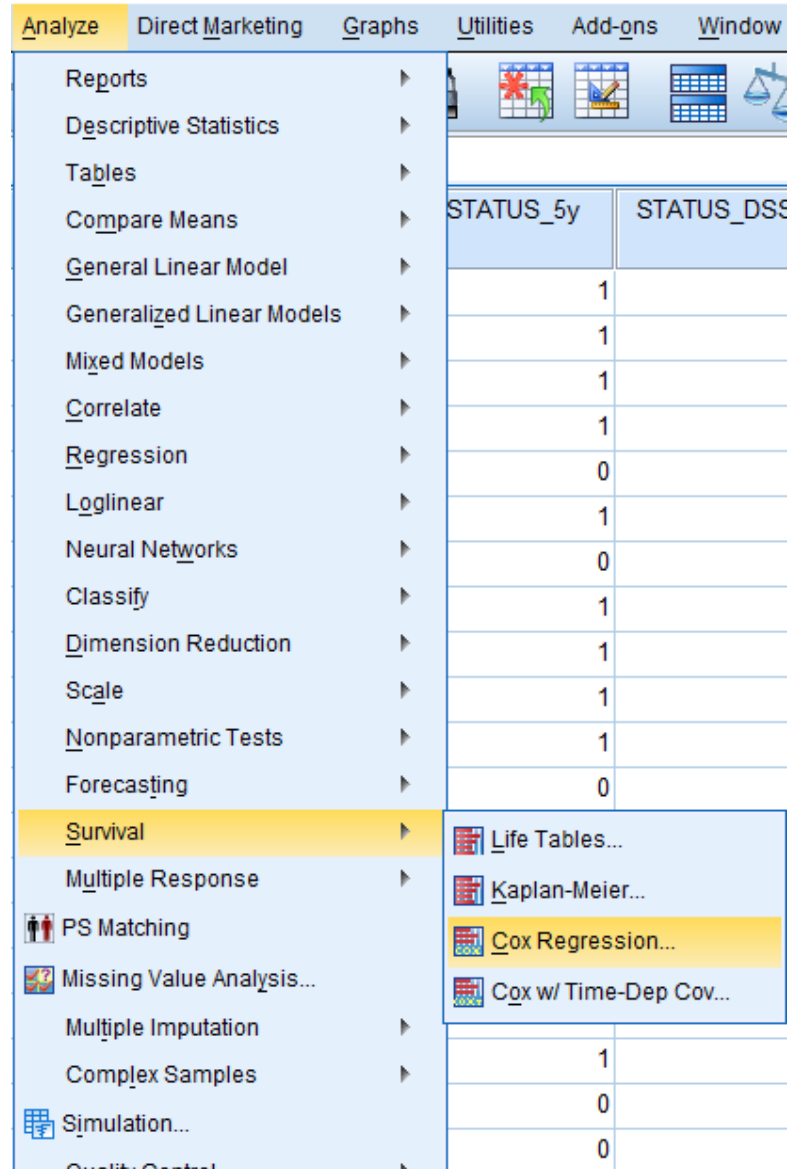
Change

Reference Category: Last First

OK Paste Reset Cancel Help

Cox model-分析操作

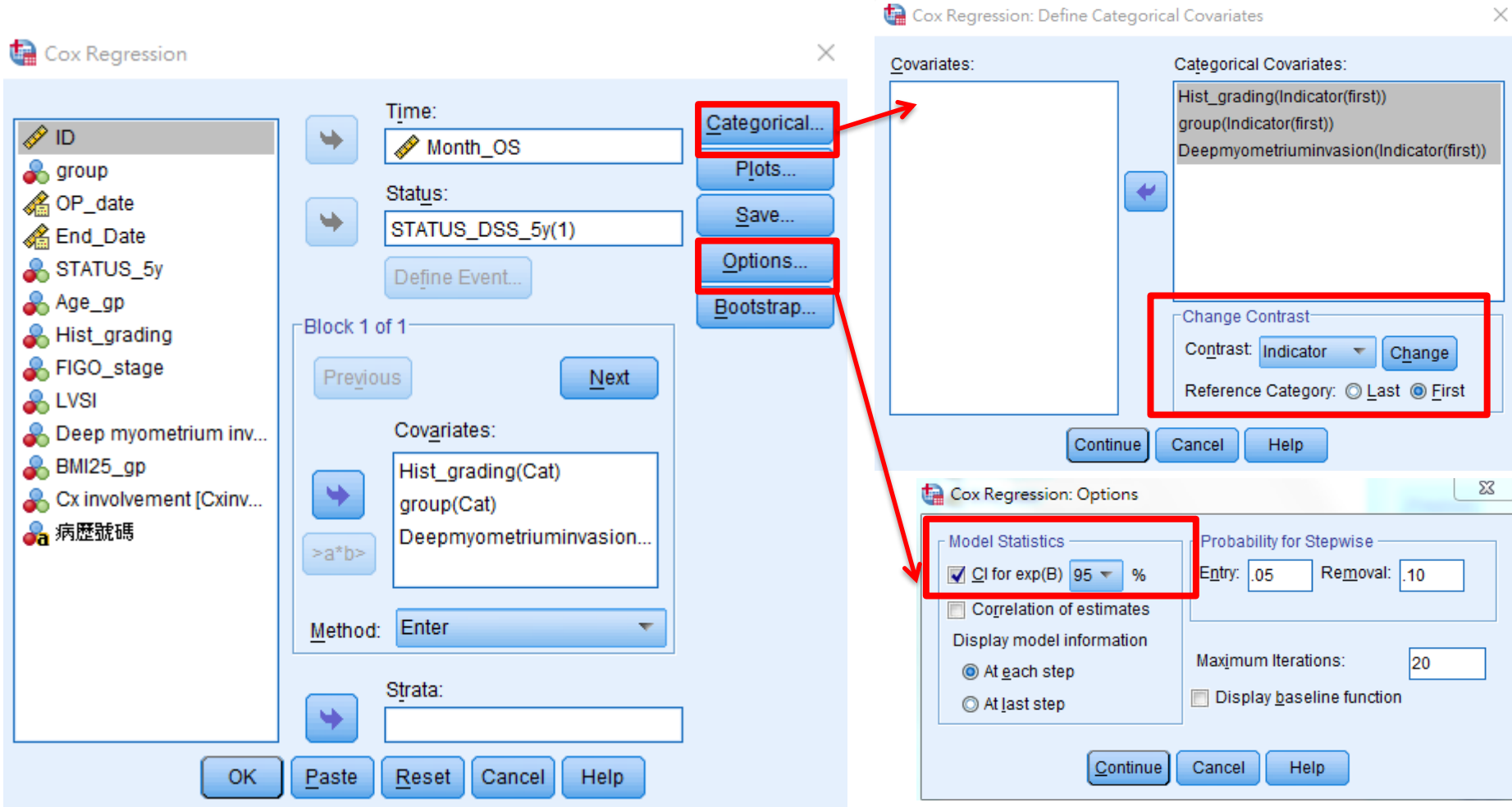
分析>存活分析>Cox迴歸



The image shows the SPSS software interface with the 'Analyze' menu open. The 'Survival' option is highlighted, and its submenu is displayed. The submenu includes options like 'Life Tables...', 'Kaplan-Meier...', 'Cox Regression...' (which is highlighted), and 'Cox w/ Time-Dep Cov...'. The background shows a data view with columns 'STATUS_5y' and 'STATUS_DSS'.

STATUS_5y	STATUS_DSS
1	
1	
1	
1	
0	
1	
0	
1	
1	
1	
0	
1	
1	
1	
0	
1	
0	
0	

Cox model-分析操作



The image displays two SPSS dialog boxes for Cox Regression analysis, with red boxes and arrows highlighting specific settings.

Cox Regression: Define Categorical Covariates

- Covariates:** (Empty list)
- Categorical Covariates:**
 - Hist_grading(Indicator(first))
 - group(Indicator(first))
 - Deepmyometriuminvasion(Indicator(first))
- Change Contrast:**
 - Contrast: Indicator (dropdown)
 - Change (button)
 - Reference Category: ☐ Last ☒ First
- Buttons: Continue, Cancel, Help

Cox Regression

- Time:** Month_OS
- Status:** STATUS_DSS_5y(1)
- Define Event...** (button)
- Block 1 of 1:**
 - Previous (button)
 - Next (button)
- Covariates:**
 - Hist_grading(Cat)
 - group(Cat)
 - Deepmyometriuminvasion...
- Method:** Enter (dropdown)
- Strata:** (Empty text box)
- Buttons: OK, Paste, Reset, Cancel, Help

Cox Regression: Options

- Model Statistics:**
 - ☒ CI for exp(B) 95 %
 - ☐ Correlation of estimates
 - Display model information
 - ☒ At each step
 - ☐ At last step
- Probability for Stepwise:**
 - Entry: .05
 - Removal: .10
- Maximum Iterations:** 20
- ☐ Display baseline function
- Buttons: Continue, Cancel, Help

Red annotations include boxes around the **Categorical...**, **Options...**, **Change Contrast** section, and the **Model Statistics** section in the Options dialog, with arrows pointing to the corresponding fields in the other dialog boxes.

Cox model-Output

Categorical Variable Codings^{a,c,d}

		Frequency	(1)
group ^b	0=CT alone	27	0
	1=Sandwich	39	1
Hist_grading ^b	1=Grade 1 and 2	29	0
	2=Grade 3	37	1
Deepmyometriuminvasion ^b	0=Absent	27	0
	1=Present	39	1

a. Category variable: group

b. Indicator Parameter Coding

c. Category variable: Hist_grading

d. Category variable: Deepmyometriuminvasion (Deep myometrium invasion)

經多變項調整後, Sandwich相較於CT alone降低0.23倍的風險死於子宮內膜癌且有統計差異(p= 0.03)

Variables in the Equation

	B	SE	Wald	df	Sig.	Exp(B)	95.0% CI for Exp(B)	
							Lower	Upper
Hist_grading	2.215	1.050	4.452	1	.035	9.161	1.170	71.701
group	-1.474	.679	4.711	1	.030	.229	.060	.867
Deepmyometriuminvasion	2.245	1.051	4.559	1	.033	9.442	1.202	74.150

生統小組：統計方法教育訓練



Thank you for listening