

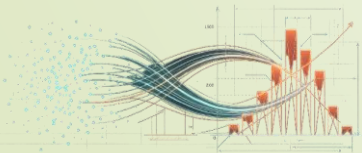
描述性統計的資料 視覺化呈現

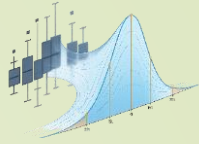
1

醫學研究部 生物統計小組

徐倩儀

2026/4/14





內容大綱

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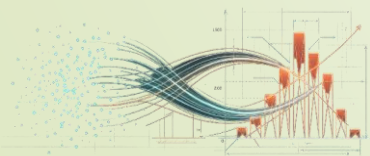
➤ 長條圖 (bar chart)

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Data Definition

Variable



Categorical
(Qualitative)

Numerical
(Quantitative)

Nominal (名義)

利用名稱或數值區分

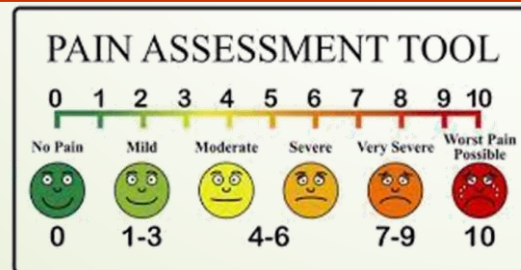
- Race
- Sex (male/female)
- Blood group (A/B/AB/O)



Ordinal (次序)

程度排序

- Pain severity
- 考試名次
- Disease stage (mild/moderate/severe)



Discrete (間斷)

沒有小數點

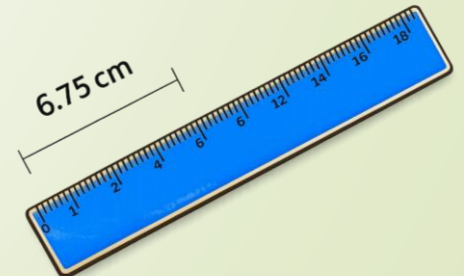
- Number of children



Continuous (連續)

可以有小數點

- Height
- Weight
- Temperature





平均值

Mean

集中趨勢的統計指標

算術平均數

公式

$$\frac{x_1 + x_2 + x_3 + \dots + x_n}{n}$$

樣本 \bar{x}

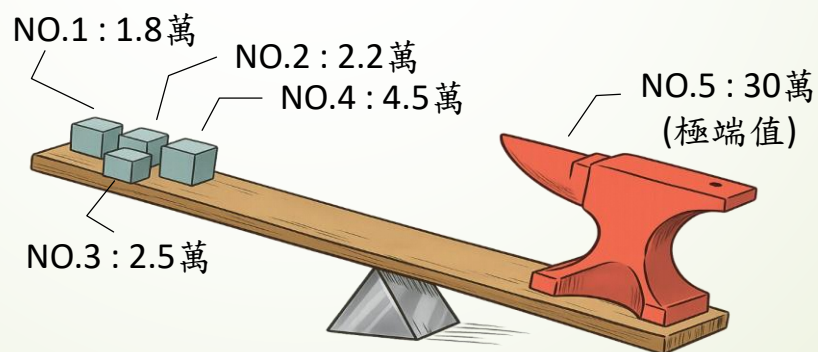
母體 μ

反映資料情況

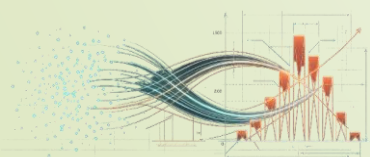
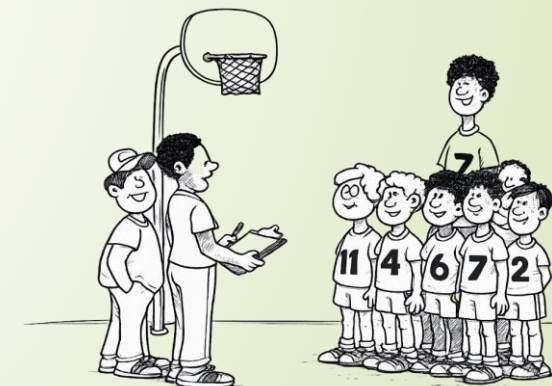
直觀的特性

比較組別的差異

易受到極端值影響



平均值：8.2萬



平均值

易受極端值影響



Table 1: Top 25 in average wealth per adult (USD)

Numbers in parentheses indicate the position held in 2023

	2024	
Switzerland (1)	687,166	①
United States (4)	620,654	②
Hong Kong SAR (3)	601,195	③
Luxembourg (2)	566,735	④
Australia (5)	516,640	⑤
Denmark (6)	481,558	⑥
Singapore (8)	441,596	⑦
New Zealand (7)	393,773	⑧
Netherlands (12)	370,697	⑨
Norway (9)	368,410	⑩
Canada (10)	365,953	⑪
Belgium (11)	349,404	⑫
United Kingdom (13)	339,700	⑬
Sweden (15)	334,391	⑭
Taiwan (16)	312,075	⑮
France (14)	301,503	⑯
Israel (18)	284,224	⑰
Ireland (20)	258,357	⑱
Germany (17)	256,715	⑲
South Korea (21)	251,223	⑳
Austria (19)	243,473	㉑
Spain (22)	233,739	㉒
Italy (24)	214,663	㉓
Japan (23)	205,221	㉔
Finland (26)	183,367	㉕

Table 2: Top 25 in median wealth per adult (USD)

Numbers in parentheses indicate the position held in 2023

Luxembourg (1)	395,340
Australia (2)	268,424
Belgium (3)	253,539
Hong Kong SAR (4)	222,015
Denmark (6)	216,098
New Zealand (5)	207,707
Switzerland (7)	182,248
United Kingdom (8)	176,370
Canada (10)	151,910
France (11)	146,017
Norway (9)	142,501
Netherlands (12)	131,896
Spain (15)	126,290
Italy (13)	124,473
United States (14)	124,041
Malta (19)	120,875
Taiwan (16)	114,871
Singapore (18)	113,976
Ireland (21)	105,626
South Korea (20)	104,067
Japan (17)	102,198
Qatar (22)	102,178
Finland (23)	94,794
Sweden (24)	89,430
Israel (26)	88,866

Source: UBS Global Wealth Report 2025

行政院主計總處於 2026 年 2 月 11 日發布了 114 年（2025 年）全年受僱員工薪資統計結果。該新聞稿指出，隨著景氣復甦及 AI 浪潮帶動，經常性薪資增幅創下 26 年來新高。

以下為 2026 年發布之 114 年全年薪資統計重點內容：

1. 平均薪資統計

每月經常性薪資**平均數：為 47,884 元**，較上（113）年增加 3.09%，增幅為 89 年以來最高。

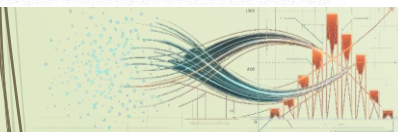
每人全年總薪資平均數：為 760,632 元（含加班費及獎金），亦增 3.91%。

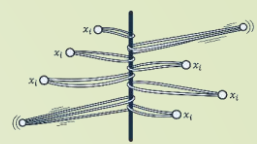
2. 薪資中位數統計

主計總處指出，由於薪資**平均數易受高薪者拉抬，中位數更能反映一般受僱員工的真實感受：**

每月經常性薪資**中位數：為 38,406 元**，較上年增加 3.03%。

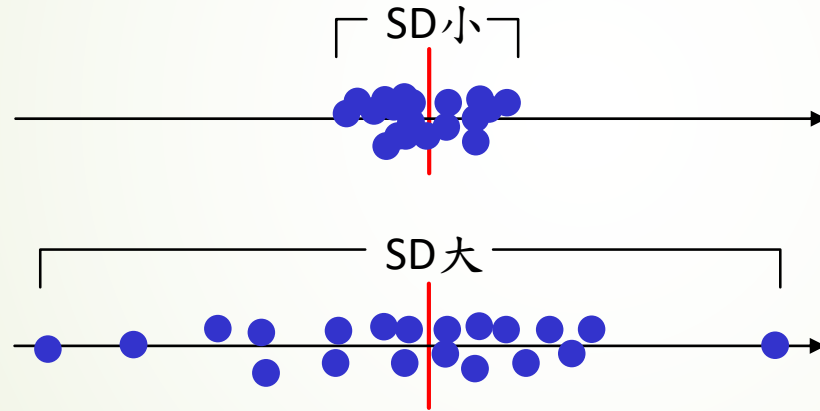
中位數與平均數差距：中位數（3.84 萬）與平均數（4.79 萬）**差距約 9,478 元**。





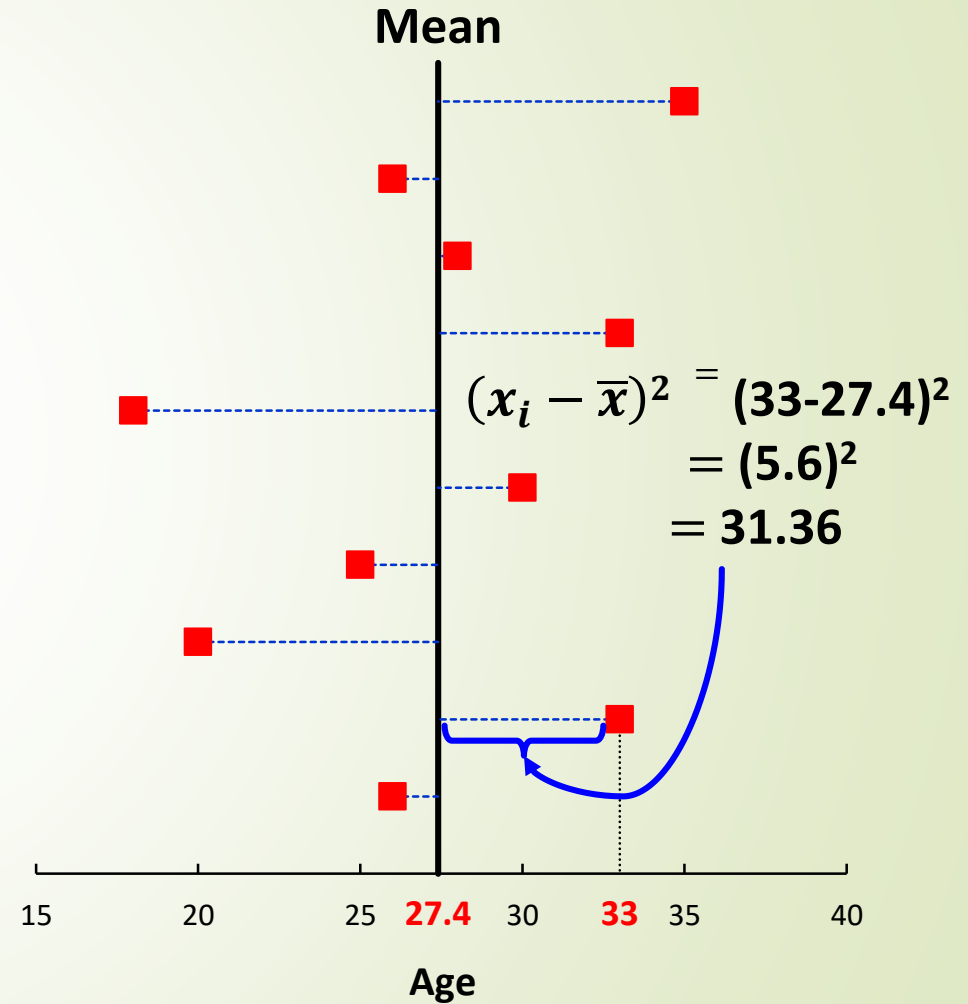
標準差

- Standard Deviation, SD
- 樣本各資料點分布的離散或變異情形



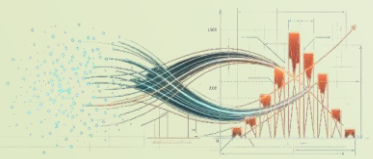
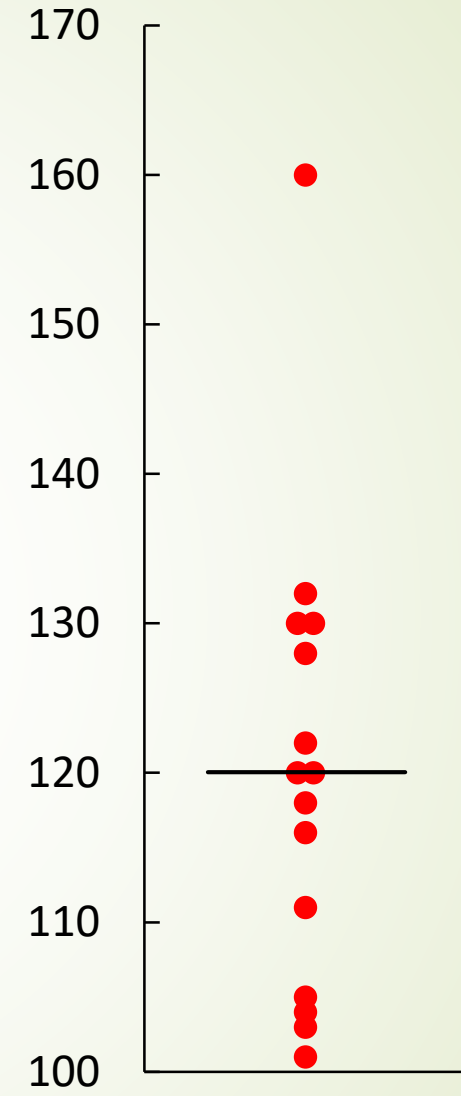
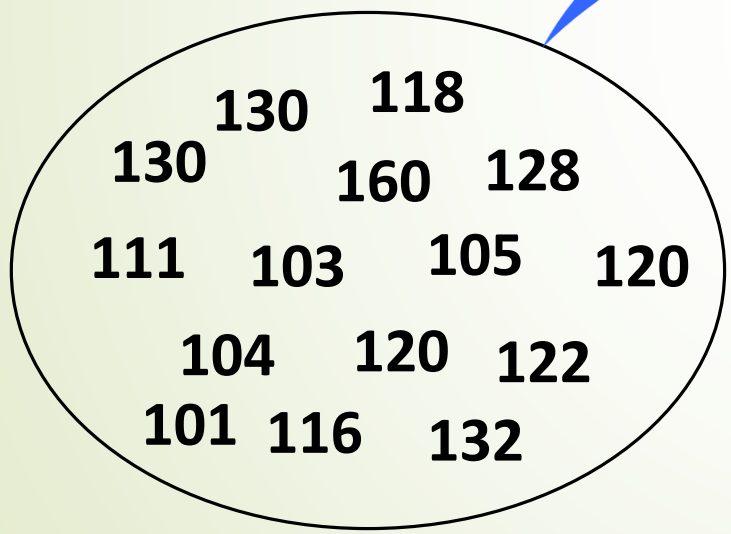
公式

$$\sqrt{\frac{\sum(x_i - \bar{x})^2}{n-1}}$$



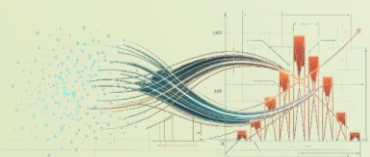
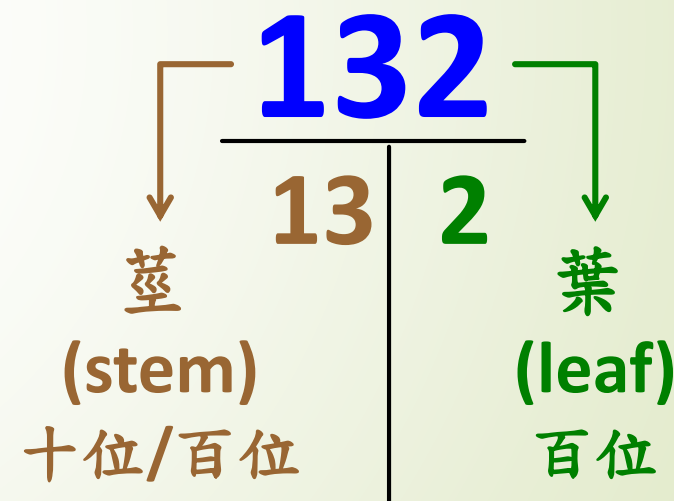
點狀圖 (dot plot)

- 資料數量少
- 保留原始數據
- 分布情形

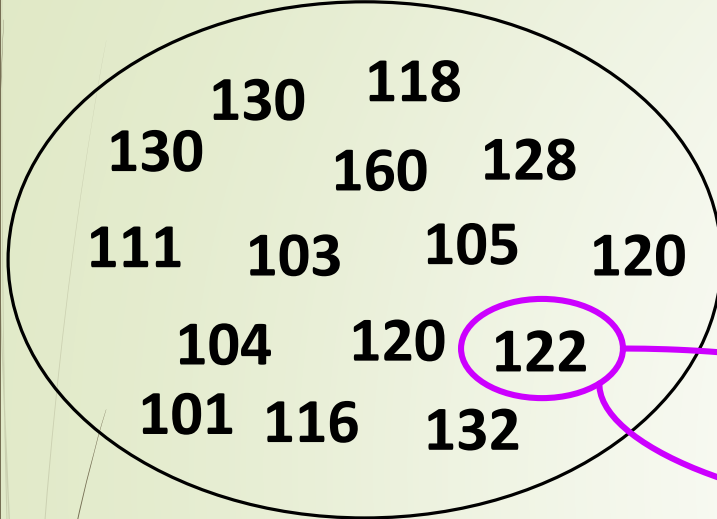


枝葉圖, 莖葉圖 (stem-and-leaf)

- 保留原始數據
- 適用於小樣本
 - 數字即圖形
- 區分莖/葉
 - stem：由小排到大，**不可以有空莖**
 - leaf：由小到大逐一填上

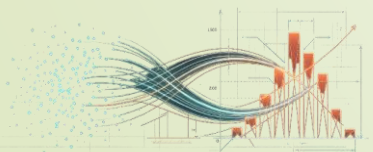


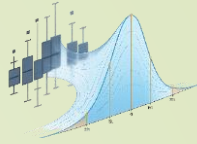
枝葉圖, 莖葉圖 (stem-and-leaf)



stem	leaf
10	0024
11	0446
12	028
13	002
14	
15	
16	0

Group A	stem	Group B
7	10	02
40	11	468
443	12	0238
98765	13	02
30	14	12
6	15	5
2	16	1



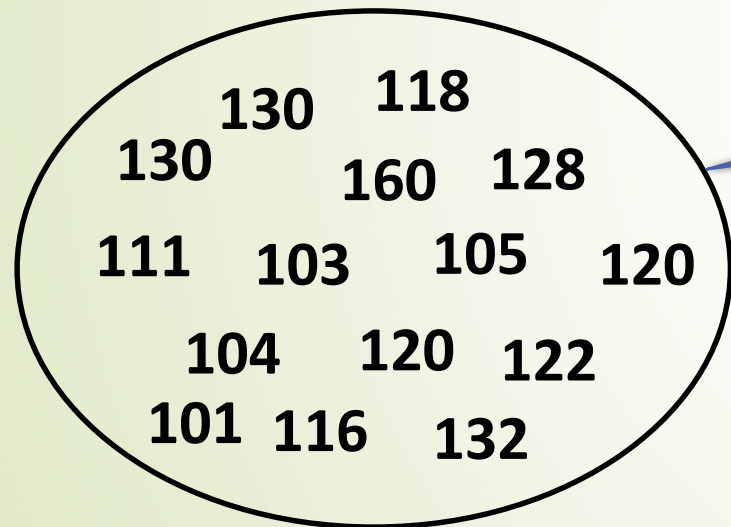


次數分配表

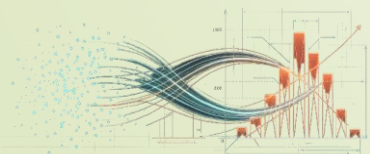
➤ 所有數值的出現次數

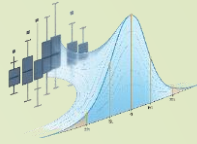
➤ 表格方式呈現

➤ 數值依照大小排序



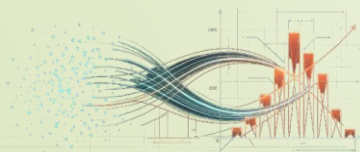
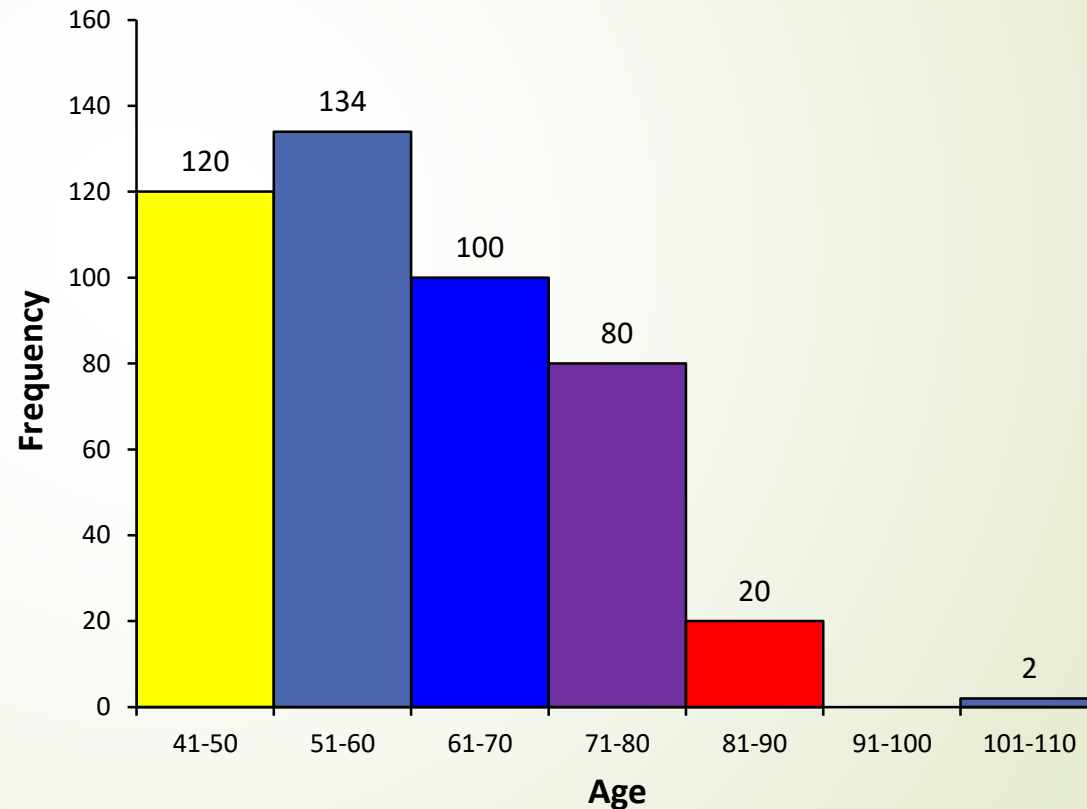
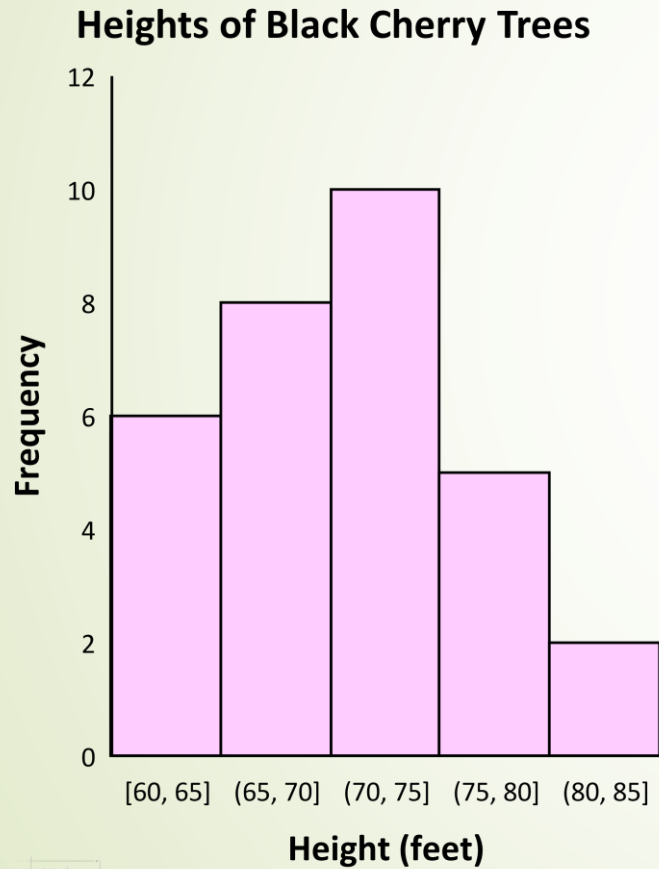
	Frequency	Percent	Cumulative Frequency	Cumulative Percent
100	2	13.3	2	13.3
102	1	6.7	3	20.0
104	1	6.7	4	26.7
110	1	6.7	5	33.3
114	2	13.3	7	46.7
116	1	6.7	8	53.3
120	1	6.7	9	60.0
122	1	6.7	10	66.7
128	1	6.7	11	73.3
130	2	13.3	13	86.7
132	1	6.7	14	93.3
160	1	6.7	15	100

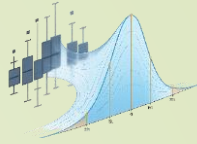




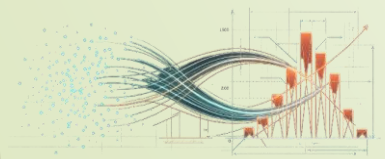
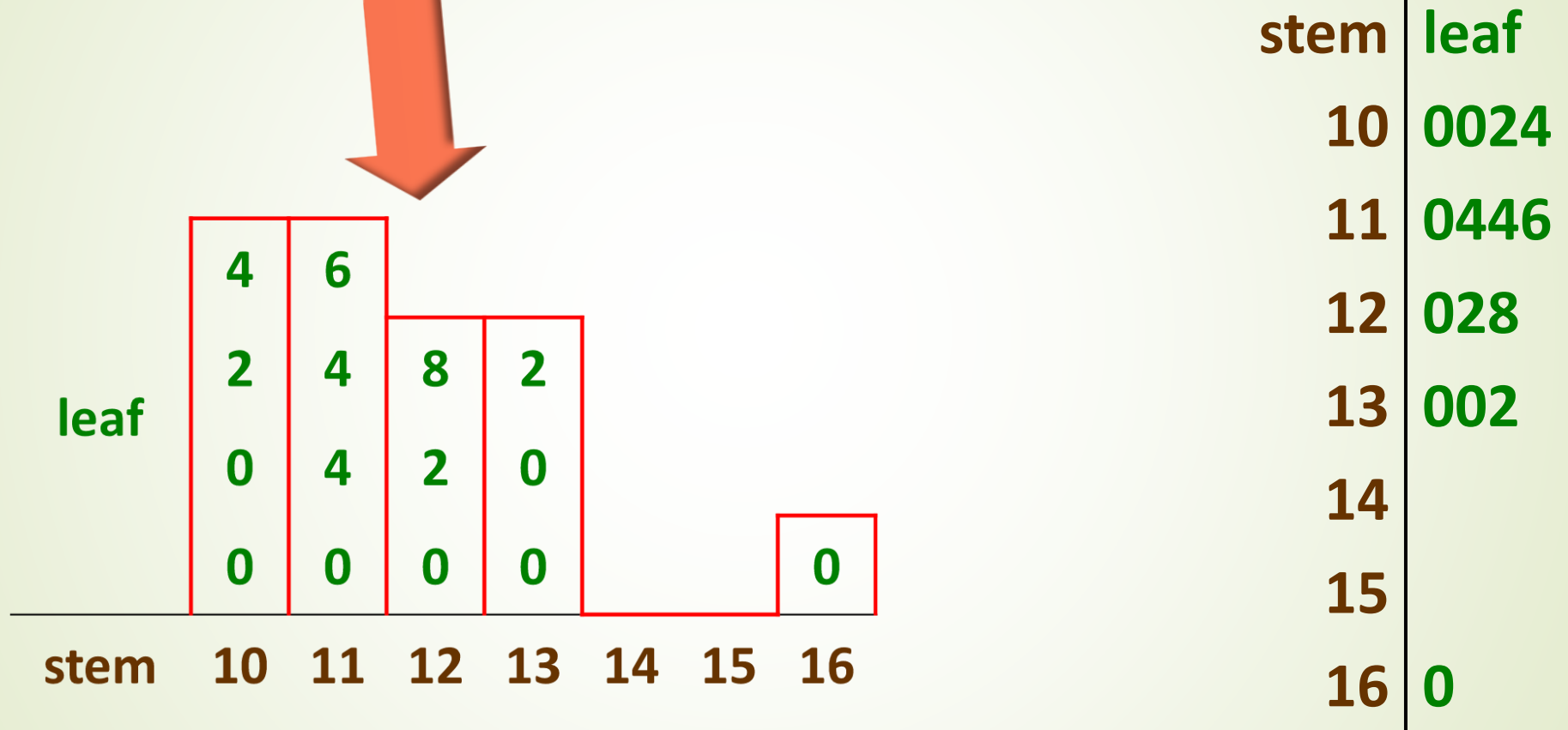
直方圖 (histogram)

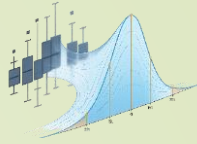
➔ X軸-數值型連續變數





直方圖 & 莖葉圖





長條圖 (bar chart)

➡ X軸-類別型離散變數

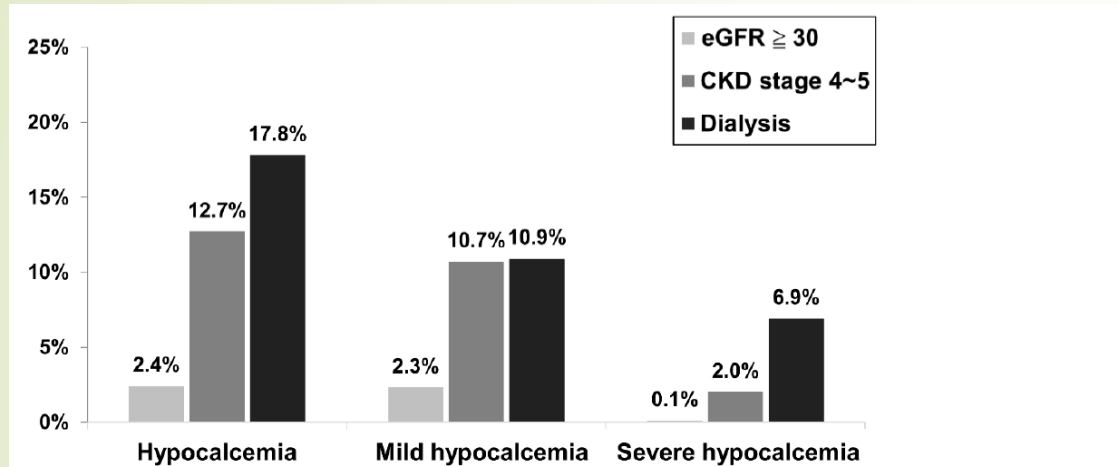
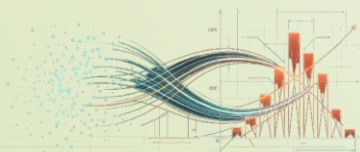
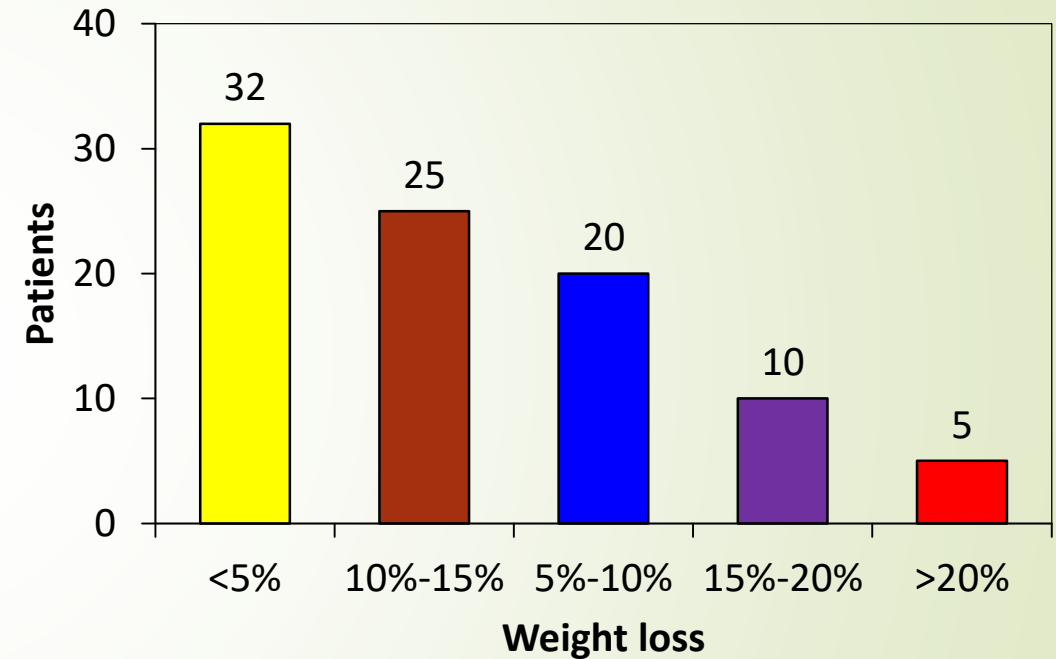
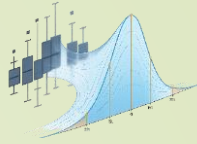


Figure 1. Incidence of hypocalcemia within 30 days post denosumab treatment among different renal function groups on denosumab. Hypocalcemia was defined as a corrected calcium level less than 8.5 mg/dl. Mild hypocalcemia was defined as a corrected calcium level higher than or equal to 7.0 mg/dl and less than 8.5 mg/dl ($7.0 \leq$ corrected calcium < 8.5 mg/dl). Severe hypocalcemia was defined as a corrected calcium level less than 7.0 mg/dl.

Healthcare (Basel). 2023 Jan 20;11(3):313. Integrated Osteoporosis Care to Reduce Denosumab-Associated Hypocalcemia for Patients with Advanced Chronic Kidney Disease and End-Stage Renal Disease. Chia-Tien Hsu, Ya-Lian Deng, Mu-Chi Chung, Shang-Feng Tsai, Shih-Yi Lin, Cheng-Hsu Chen

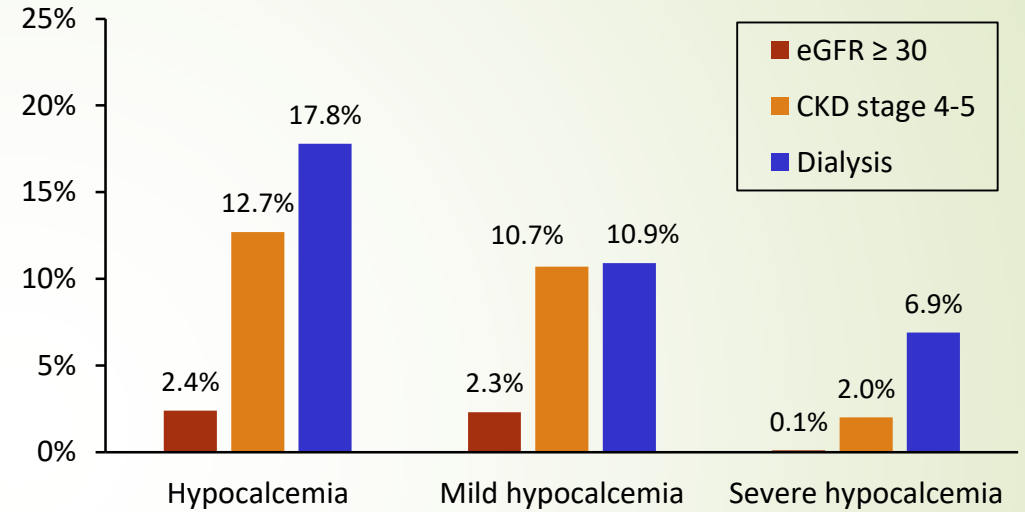
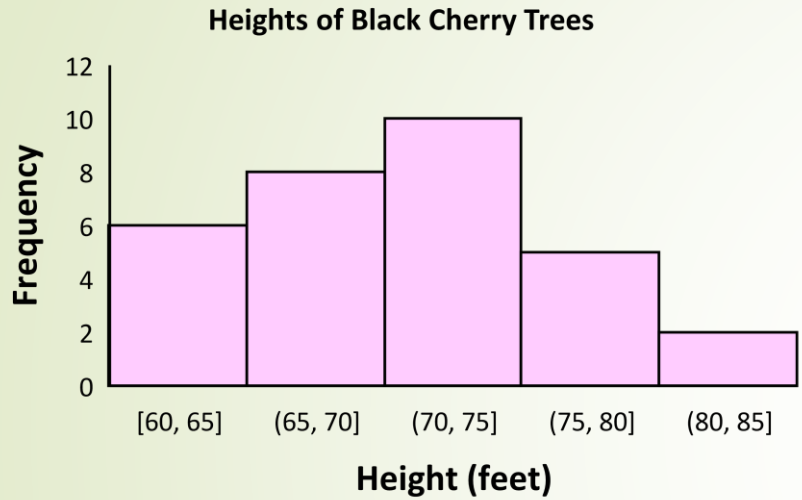




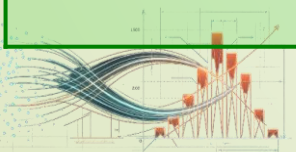
直方圖

VS

長條圖



資料分佈	呈現結果	資料大小
數值	X軸變項	類別
Continuous variables (連續變項)	變項類型	Discrete variables (間斷變項)
連接、無間隔 (代表數據連續)	組距間隔	有間隔 (代表各自獨立)
有順序	組距順序	無順序
不可置換	資料邏輯	可置換 (可依大小或類別置換)



圓餅圖 (pie plot)

➤ Parts-to-whole

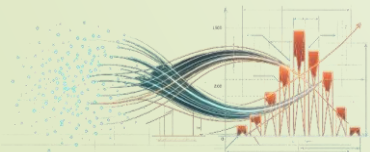
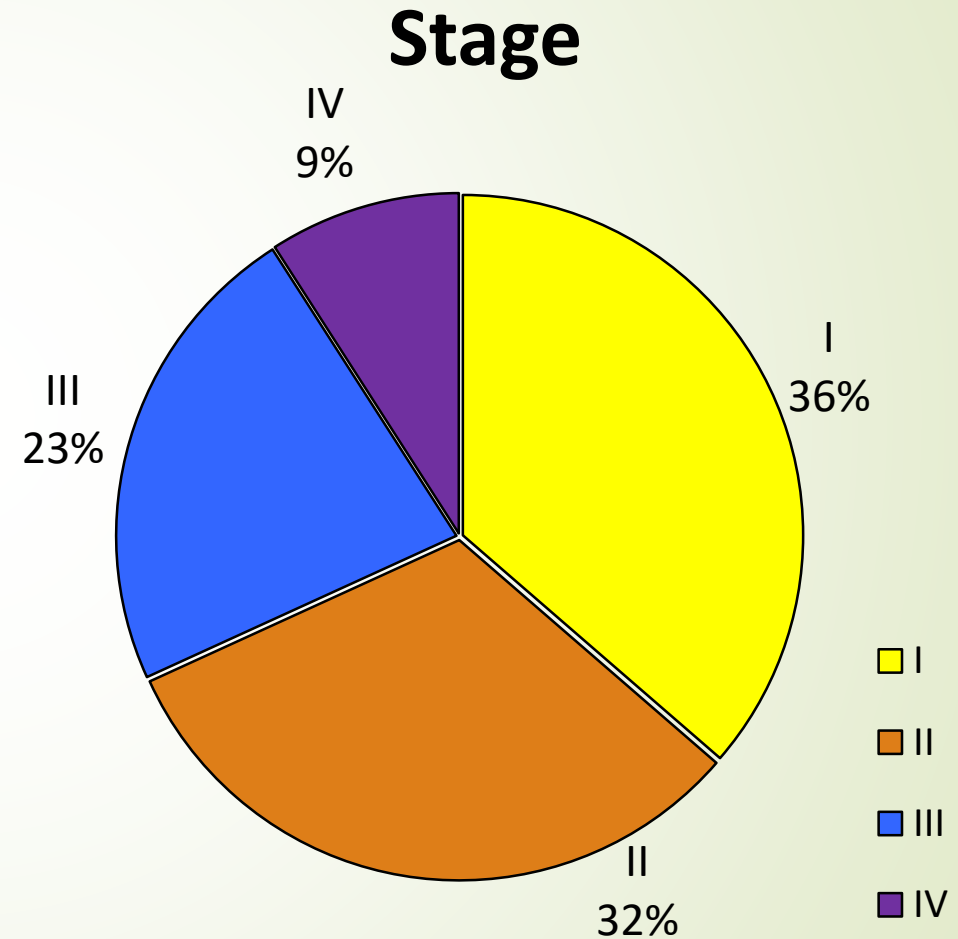
➤ Categories add up to 100%

➤ 不建議使用

➤ 類別過多

➤ over 5-7

➤ 比例接近



箱型圖 (box plot)

盒鬚圖 (Box-whisker plot)

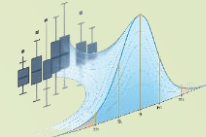
數據分佈情況

➤ 偏態 (skewness)

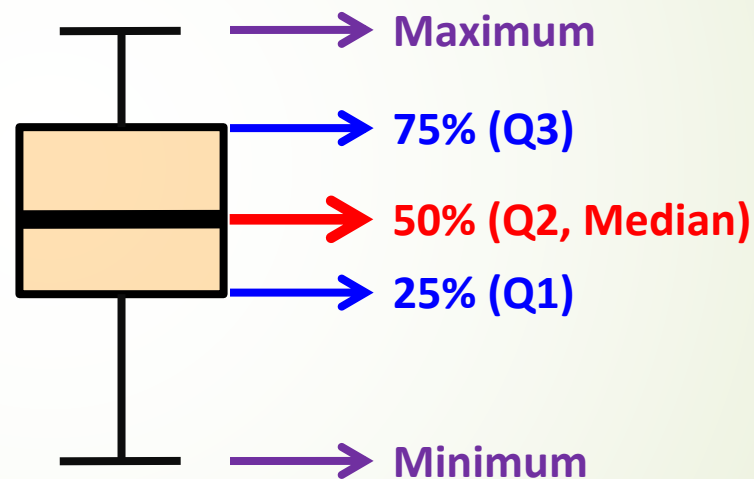
➤ 離群值 (outliers)

➤ 特殊組群

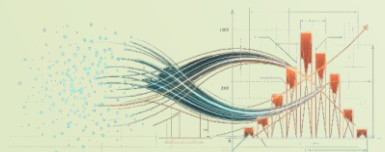
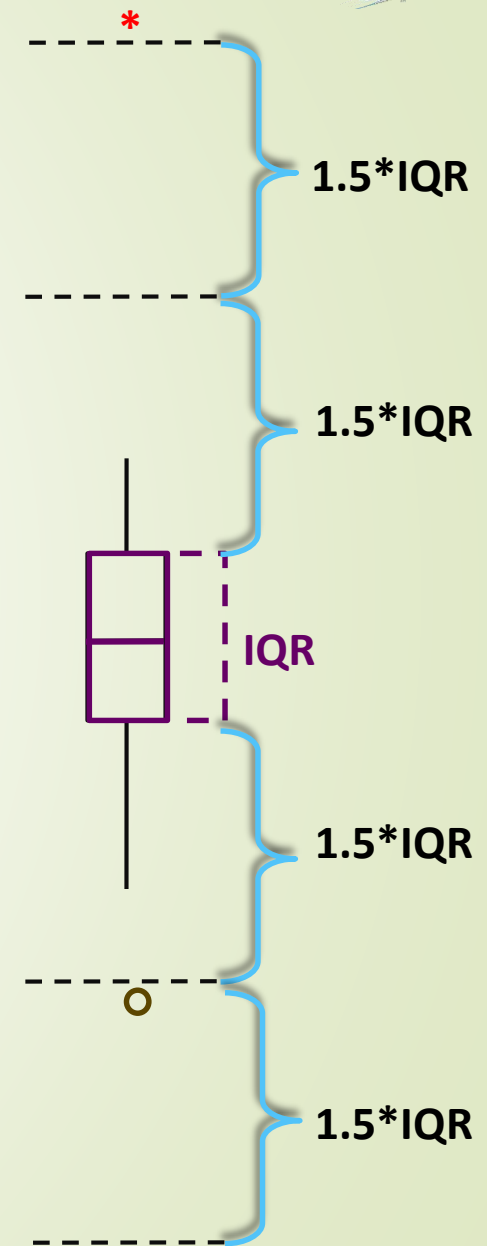
➤ 隱藏更重要情形

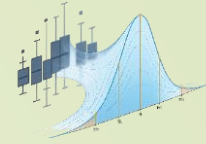


嚴重離群值
(極端值)

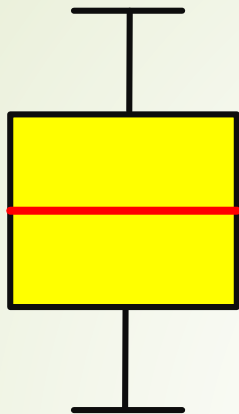


溫和離群值
(outliers)

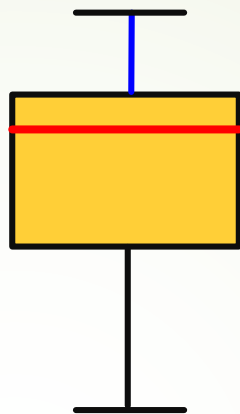




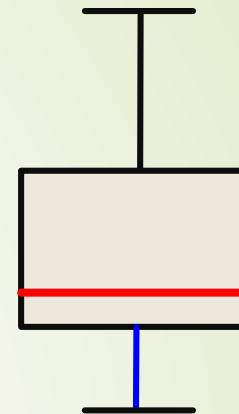
箱型圖 (box plot)



對稱



負偏態 (左偏分佈)

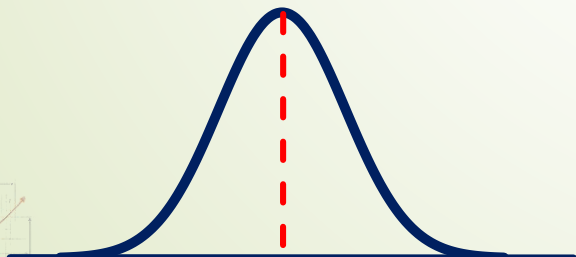


正偏態 (右偏分佈)

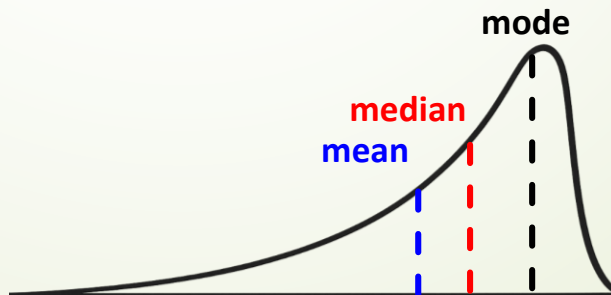
中位數	盒子中間	盒子上方	盒子下方
鬚長度	上下相同	上短於下	下短於上



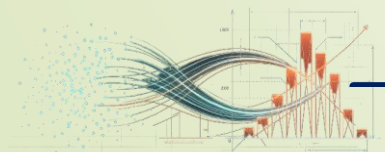
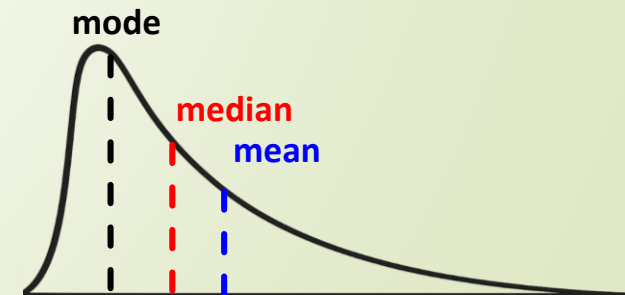
mean
median
mode



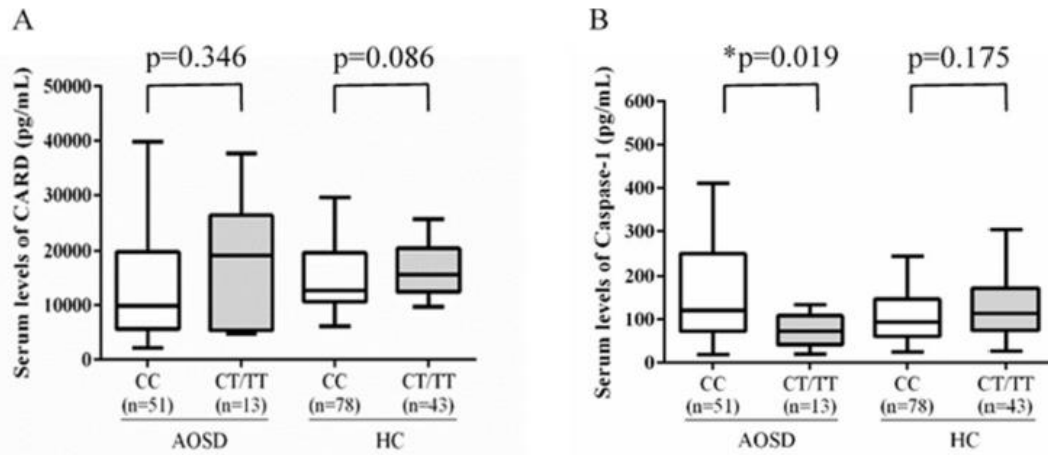
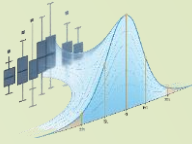
mode
median
mean



mode
median
mean



箱型圖 (box plot)



Life (Basel). 2021 Apr 23;11(5):382. CARD8 SNP rs11672725 Identified as a Potential Genetic Variant for Adult-Onset Still's Disease. Wei-Ting Hung, Yi-Ming Chen, Shuen-lu Hung, Hsin-Hua Chen, Ning-Rong Gung, Chia-Wei Hsie, Kuo-Tung Tang, Der-Yuan Chen

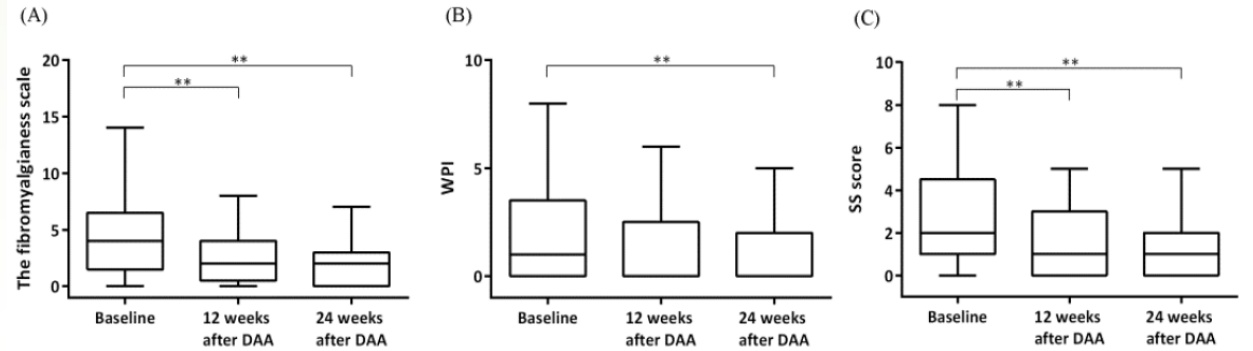
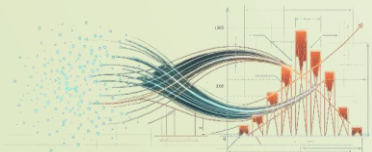
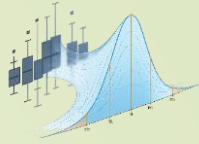


Figure 3. Comparison of (A) fibromyalgia, (B) widespread pain index (WPI), and (C) symptom severity (SS) score between baseline, 12 and 24 weeks after cessation of DAA therapy in CHC patients. CHC, chronic hepatitis C; DAA, direct-acting antiviral drugs. ** $p < 0.001$ by the Wilcoxon signed rank test.

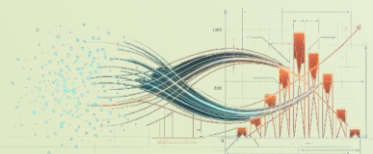
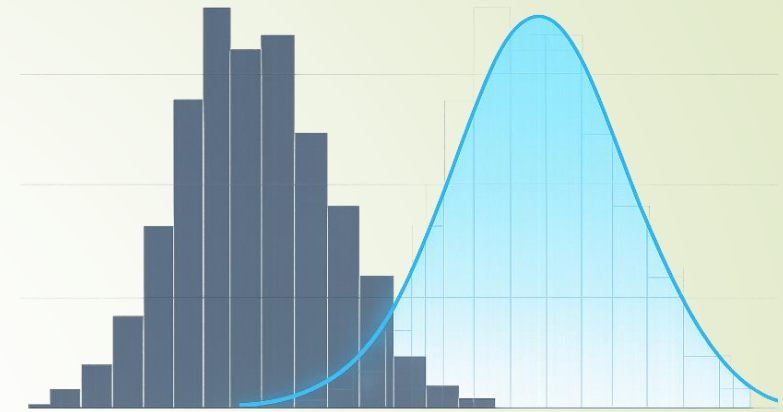
J Clin Med. 2022 Sep 10;11(18):5327. Direct-Acting Antiviral Drugs Reduce Fibromyalgia Symptoms in Patients with Chronic Hepatitis C. Kuo-Tung Tang, Ching-Chun Lin, Yi-Hsing Chen, Tsai-Ling Liao, Der-Yuan Chen, Sheng-Shun Yang, Chia-Chang Chen

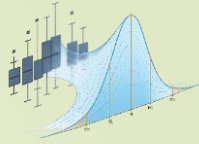




密度圖 (density plot)

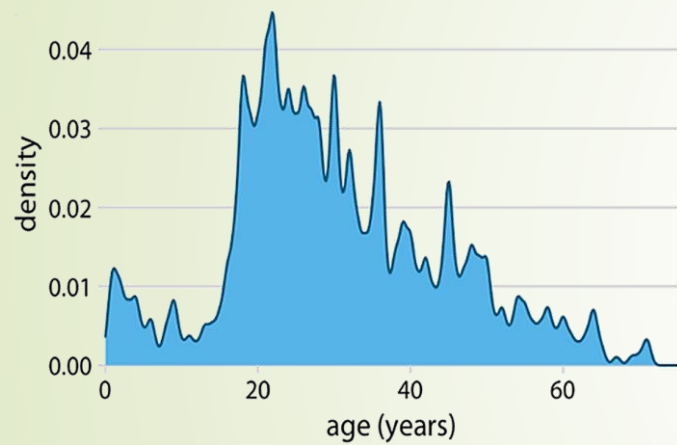
- X軸-數值型連續變數
- 類似直方圖
 - 連續平滑曲線
- 帶寬(bandwidth)
 - 大小決定機率密度函數有多平滑
 - 越小-曲線會越尖銳，保有細部的分布
 - 越大-曲線會越平滑，分布的細節消失





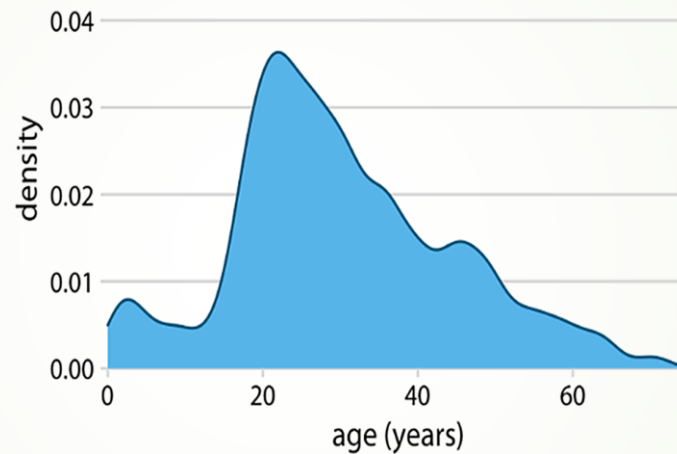
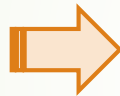
密度圖 (density plot)

➡ 帶寬 (bandwidth) 的影響力



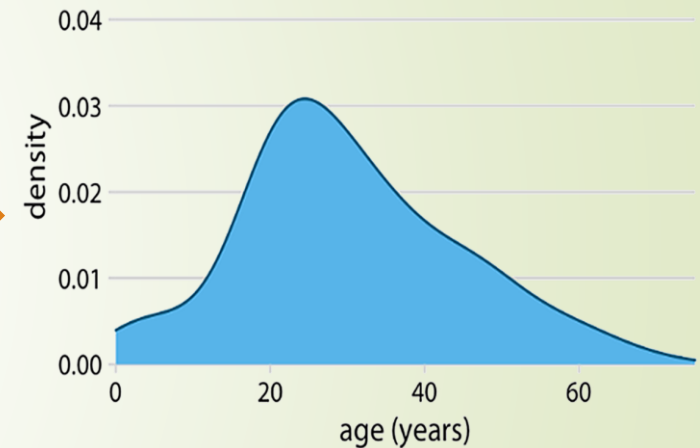
bandwidth = 0.5

曲線尖銳
保留所有細部分佈
但雜訊過多



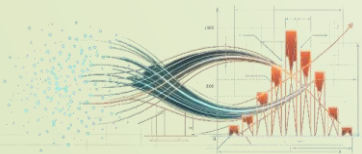
bandwidth = 2

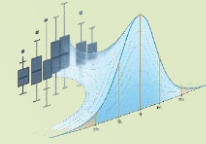
曲線適度平滑
呈現真實趨勢



bandwidth = 5

曲線過度平滑
重要分佈細節消失





常態分佈

➤ 高斯分佈 (Gaussian shape)

➤ 以 平均值 為中心的對稱曲線

➤ 平均值 = 中位數 = 眾數

➤ 標準差 (StD)

➤ 鐘型曲線形狀

➤ 機率 (面積) (CI of mean)

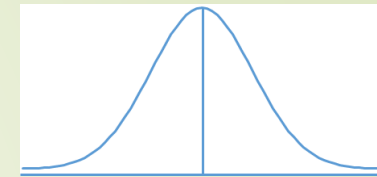
➤ 68.27% = mean \pm 1 SD

➤ 95.45% = mean \pm 2 SD

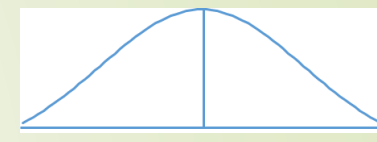
➤ 95% = mean \pm 1.96 SD

Mean=0

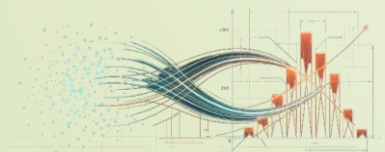
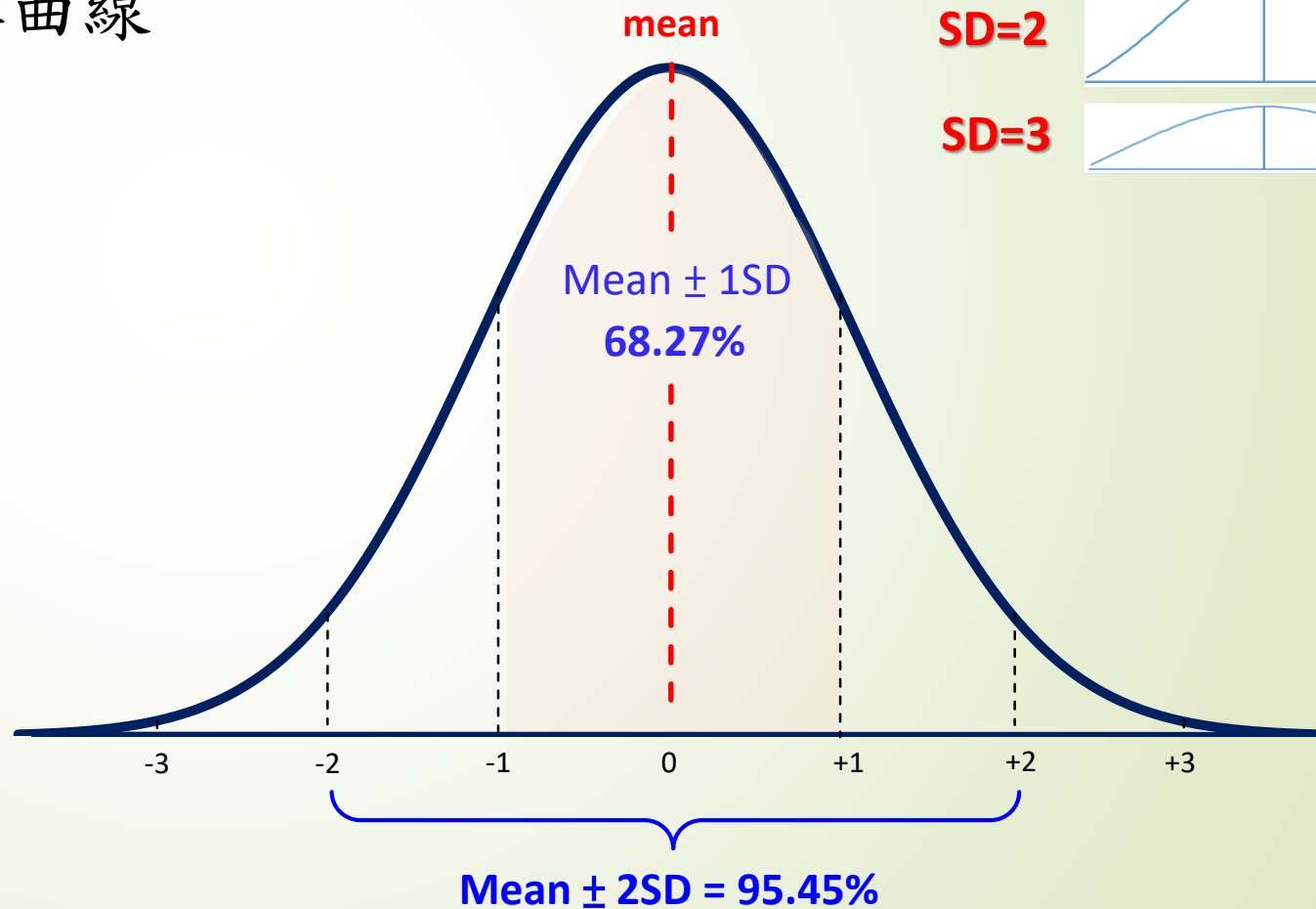
SD=1

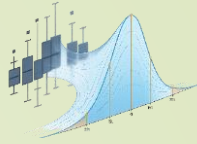


SD=2



SD=3





常態分佈

常態檢定

樣本數 ≥ 50

Kolmogorov-Smirnov
(K-S)

	Kolmogorov-Smirnov		
	Statistic	df	Sig.
Age	0.065	56	0.200
SBP	0.108	56	0.099

接受 H_0
常態分佈

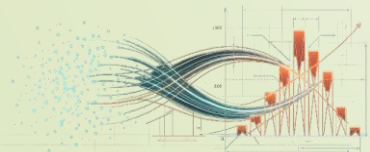
樣本數 < 50

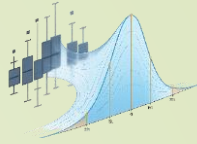
Shapiro-Wilk
(S-W)

	Shapiro-Wilk		
	Statistic	df	Sig.
Age	0.940	39	0.038
SBP	0.883	39	0.001

拒絕 H_0
非常態分佈

H_0 : 資料分佈為常態分佈
 H_1 : 資料分佈非常態分佈



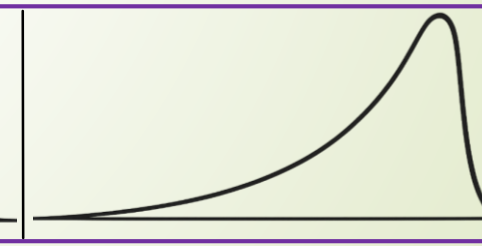
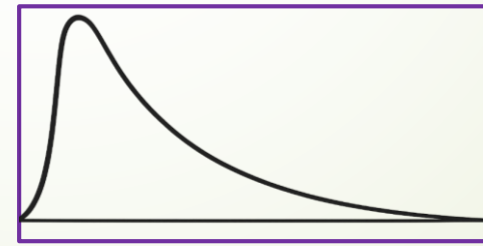
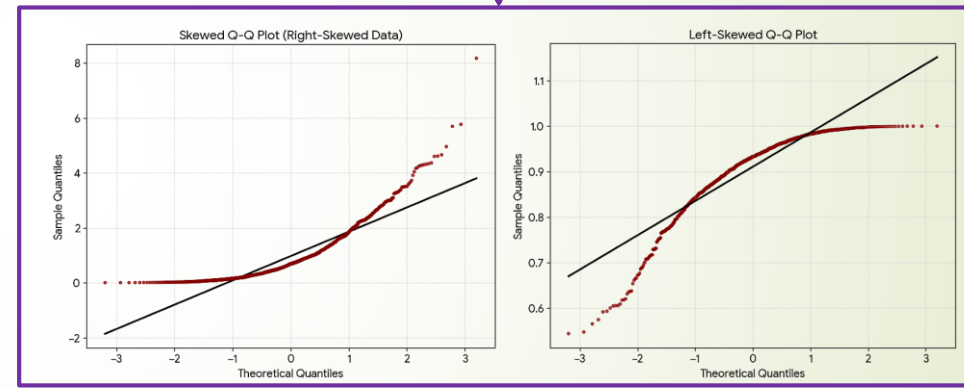
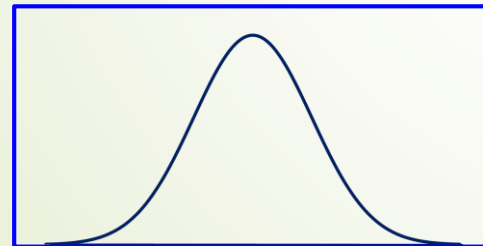
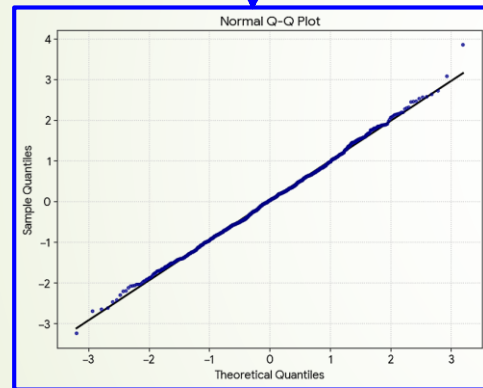


常態分佈

Q-Q plot

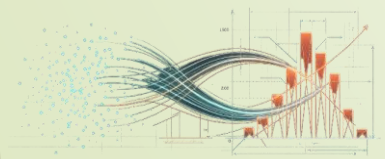
常態分佈

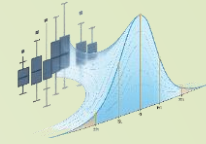
偏態分佈



右偏分佈

左偏分佈

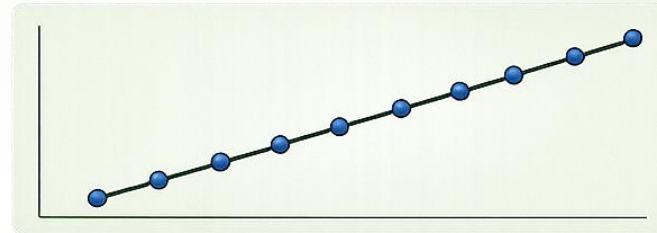




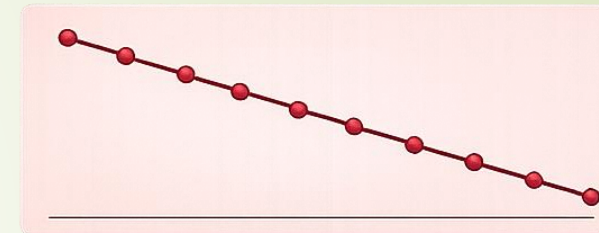
散佈圖 (scatter plot)

- ➡ 兩個連續變項之間的關係
- ➡ 相關強度

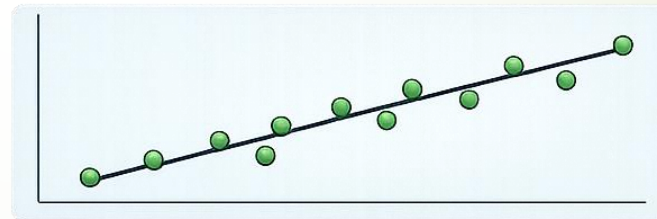
$r = +1$
(Perfect positive correlation)



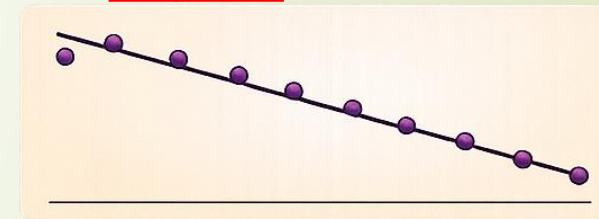
$r = -1$
(Perfect negative correlation)



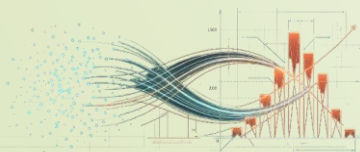
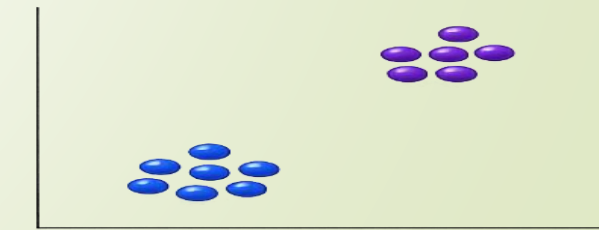
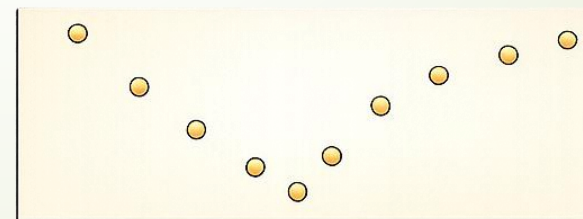
$0 < r < 1$
(Positive correlation)



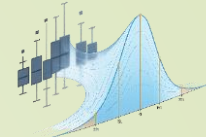
$-1 < r < 0$
(Negative correlation)



r close to 0
(Weak or no association)



總結



目的

分佈
(Distribution)

比較
(Comparison)

相關
(Correlation)

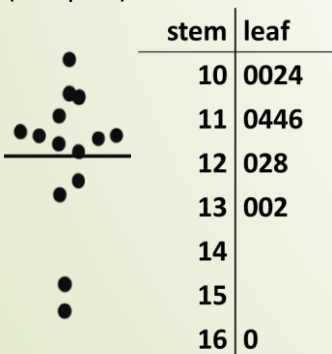
小樣本
(保留原始數據)

大樣本

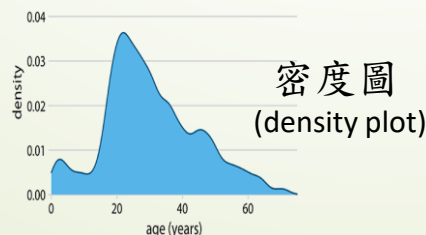
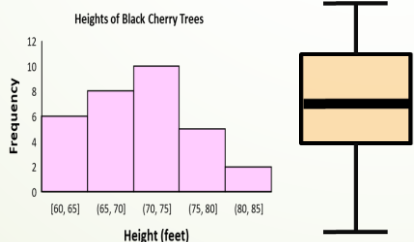
類別資料

兩個
連續變項

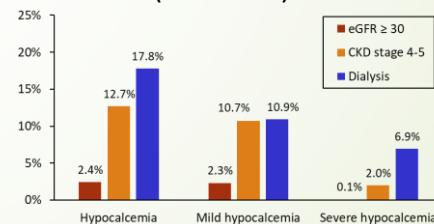
點狀圖 (dot plot) 枝葉圖 (stem-and-leaf)



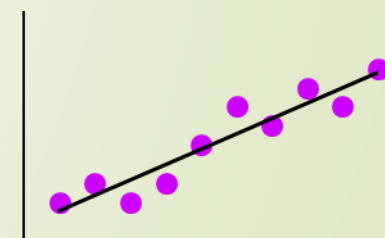
直方圖 (histogram) 箱型圖 (box plot)

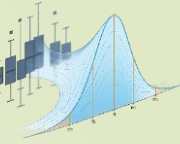


長條圖 (bar chart)



散佈圖 (scatter plot)





生統小組
統計方法教育訓練



Thank you

問卷調查



For your attention!!

