

★ The 10% condition

Ref: <https://www.statology.org/10-percent-condition/>

在實驗實際上不獨立的情況下，如果使用的樣本不超過母體的 10%，仍然可以假設他們是獨立的

Classroom Size	Sample Size / Classroom Size	P(All 4 students prefer football) <i>Independent trials</i>	P(All 4 students prefer football) <i>Not Independent trials</i>
20	20.0%	$10/20 * 10/20 * 10/20 * 10/20 = .0625$	$10/20 * 9/19 * 8/18 * 7/17 = .0433$
40	10.0%	$20/40 * 20/40 * 20/40 * 20/40 = .0625$	$20/40 * 19/39 * 18/38 * 17/37 = .0530$
100	4.0%	$50/100 * 50/100 * 50/100 * 50/100 = .0625$	$50/100 * 49/99 * 48/98 * 47/97 = .0587$
1,000	0.4%	$500/1,000 * 500/1,000 * 500/1,000 * 500/1,000 = .0625$	$500/1,000 * 499/999 * 498/998 * 497/997 = .0621$

★ Accuracy vs. Precision

Ref:

<https://www.forecast.app/blog/difference-between-accuracy-precision>

<https://asana.com/zh-tw/resources/accuracy-vs-precision>

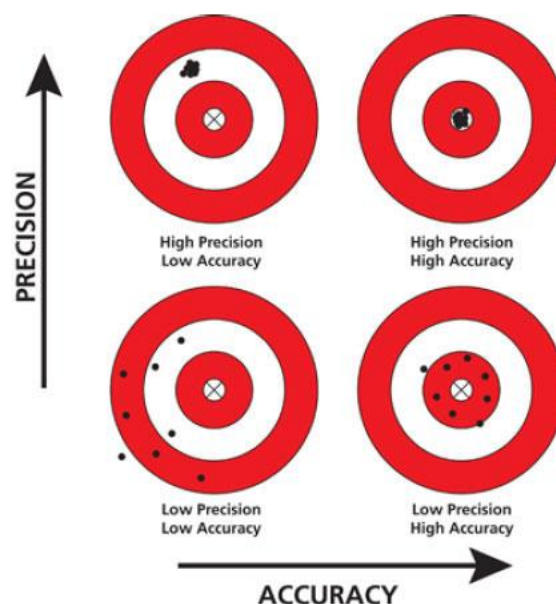
Accuracy	準確度	測量結果和實際有多接近
Precision	精確度	每次測量的結果有多接近

當樣本數增加，抽樣分配的變異程度會降低

Distribution of Sample Means

$$X \sim N(\mu, \sigma)$$

$$\bar{X} \sim N\left(\mu, \frac{\sigma}{\sqrt{n}}\right)$$



★ Standard Error vs. Standard Deviation

Ref: <https://haosquare.com/standard-error/>

Standard Deviation	標準差	各資料點與樣本平均數的距離	$s = \sqrt{\frac{\sum (X - \bar{X})^2}{n - 1}}$
Standard Error	標準誤	樣本平均數距離母體平均數多遠	$SE = \frac{s}{\sqrt{n}}$