

⑥

(a)

$\bar{X}$ $\rightarrow$ operation

$$\bar{X} = 4.5, \quad SD = 0.5 \quad \text{Sample size} = 100$$

$$\bar{Y} = 4.8, \quad SD = 1.0, \quad \text{Sample size} = 400$$

$\uparrow$
chemotherapy

$$\bar{Y} - \bar{X} = 4.8 - 4.5 = 0.3$$

$$SE(\bar{X} - \bar{Y}) = \sqrt{\frac{0.5^2}{100} + \frac{1.0^2}{400}}$$

95% ~~confidence~~ confidence interval

goes from $0.3 - 2 \cdot SE$

to $0.3 + 2 \cdot SE$

(b) older (Y : chemo)

younger (X : operation)

$$P(X > Y) = P(X - Y > 0)$$

~~$E(X - Y)$~~

$$E(X - Y) = 4.5 - 4.8 = -0.3$$

$$SD(X - Y) = \sqrt{0.5^2 + 1.0^2}$$

$$= \sqrt{1.25}$$

$$\text{So } P(X - Y > 0) = P\left(Z > \frac{0 - (-0.3)}{\sqrt{1.25}}\right)$$

$$= P\left(Z > \frac{0.3}{\sqrt{1.25}}\right)$$

look up from table 1-table value

"Independence" between X, Y is not ~~not~~ reasonable.