Decision / conclusion	Truth / Reality. H_0 true $\theta = 0$	H_0 false $\theta \neq 0$
Do not reject H_0	✓	Type II error.
Reject H_0	Type I error $\boxed{\alpha}$	$\boxed{\text{Power}}$ ✓

Family-wise error rate

Level of significance $= \alpha$.

$$\text{FWER} = P(\text{falsely rejecting at least one } H_{oi} \text{ in a set of } m \text{ tests})$$

$$= P(V \geq 1)$$

$$= 1 - P(V = 0)$$

$$= 1 - P(\text{never falsely rejecting any hypotheses in a set of } m \text{ tests})$$

$$= 1 - (1-\alpha)^m$$

P(falsely rejecting one H_0)

$= P$(making one type I error)

$= \alpha$

P(not making a type I error) $= 1 - \alpha$.

P(not making m type I errors (out of m trials)) $= (1-\alpha)^m$

Case study 2

$H_0: \mu_1 - \mu_2 = 0$
$H_1: \mu_1 - \mu_2 \neq 0$

Uncorrected p-values

	Truth: H_0 true	Truth: H_0 false
do not reject H_0	479	0
reject H_0	21	500

$(21/500 = 0.042)$

Bonferroni p-values

	Truth: H_0 true	Truth: H_0 false
do not reject H_0	500	26
reject H_0	0	474.

BH p-values

	Truth: H_0 true	Truth: H_0 false
do not reject H_0	491	0
reject H_0	9	500.