

Null Hypo: New Medicine do not have ~~any~~ effect
in curing disease

Alt Hypo: New medicine have effect on curing disease

Null Hypo

True

(suppose set true)

ie Medicine do not effective
in real sense

Decision

Correct decision

(If hypo is true
then it must be
accepted)

ie New medicine
do not have
effect on
curing disease
that we need
to accept

Incorrect decision

If hypo is set

true though
we reject it.

ie an error or
Incorrect decision

(Type I error)

Hypo Right + Reject

ie New medicine ~~is~~ is
not effective is
true though
we reject it &
says that medicine
is effective

False

(suppose set false)

(actually Medicine is effective
but we set it wrong)

Decision

Correct

(If hypo is set
false then it
must get rejected)

(ie New medicine
is actually effective
but we set it in
a wrong way
& so it must be

Rejected in the

correct way
ie Right
to make
decision)

Incorrect

If hypo is set
false though
we accept it

Type II error

(ie new
medicine is
actually
effective but
we
accept null
hypo, means
we say that
new medicine
is not effective
ie wrong
decision &
so it is an
error)

Type I and Type II Error :

1. We always test for null Hypothesis and make decision on null hypothesis.
2. i.e. we either accept null or Reject null
(based on population parameter)
3. Population parameter is truth.
4. Refer below table

		Decision	
Truth in the population	True	Retain null (accept) Correct $(1-\alpha)$	Reject Null Type I error α
	False	TYPE II error β	Correct $1-\beta$ (Power)

→ Meaning of correct decision : Retain (accept) True null hypo.

Meaning

→ Meaning of Incorrect decision : Reject True null hypo.

→ So when you Reject null hypo though it is true then it is known as Type I error.

[It is like finding an Innocent person guilty]

→ when you accept null hypo though it is false then it is known as Type II error.

Example: Medicine effect on curing disease

Decision

True in Population say No effect of new medicine		accept Null	Reject Null
		correct: medicine not effective & accepted	Type I error medicine not effective & we say it is effective
	True		
	False	Type II error medicine is really effective & we say it is not	Correct

Null Hypo: ^{New} Medicine is not effective

Here correct decision: Null Hypo is true & accept it

ie Really new medicine has no effect in curing disease

& accept it

Incorrect decision: Null hypo is true & Reject it

ie Really new medicine is not effective & we reject saying medicine is effective

This is type I error

Now: Say Null Hypo. is false (set false)
ie (medicine has actually no effect)

Here correct decision: Null hypo is false & ~~accept~~ ^{Reject} it

ie new medicine is not effective & ~~accept~~ ^{Reject} it

& Incorrect decision: Null hypo is false & ~~Reject~~ ^{accept} it

ie new medicine is not effective that ^{we} ~~accept~~ ^{thought} it is effective

This is type II error