Linear Statistical Model
Control, placebo, blind, double blind

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1 Introduction

What is the main statistics we are using in this course linear statistical model ,they are

- Control
- Confounding
- Blocking
- Randomisation

2 Control

Whenever we have some black box system for every input we will have a output in the black box system, if we want to see whether some input has some influence on the output or not always compare it with the identical level of other inputs.
We will discuss this topics in brief here. **Example why Control is important?**

- A doctor gives some specific medicine to a patient and the patient recovers from the illness with in a week, but how the doctor will know is that specific medicine is helping to cure that decease or not. For that we need another almost identical patient who will get the placebo, now we can know whether that specific medicine works for that decease or not. And this another identical man who got the placebo is control here. SO, without the control we can not conclude anything
- Supposes you went to a room and there are two switches one in "on" position and one in "off" position and there is a bulb in the room which is also "on". You will immediately conclude that the switch which is on is the switch for the bulb but actually the bulb is controlled by the

another switch so if we use the second switch as control then we can have a conclusion more efficiently.
So, do not compare value of the input with value of the output compare the change of the input with change of the output

2.1 Placebo

Suppose we want to test some medicine works for some particular illness or not. We will have 2 identical group and in one group we will give the medicine and to the another group we will give some dummy medicine like some sugar pill which neither helps nor harms. And this dummy tablet is called **Placebo**. And the group which gets the placebo is called the **Control Group**.

2.1.1 How it helps?

So, the control group helps to compare the output with the output of the group which gets the actual medicine. And this type of experiment where all the subjects kept in the dark everyone we will get the identical looking pills is called **Blind Experiment**.

2.2 Double Blind Experiment

In the blind experiment the subjects(on whom we are doing the experiments) are blind. But there are another case where the experimenter are also blind so that they can't favour any group. This type of experiment is called **"Double Blind Experiment"**. Here both the experimenters and the subjects kept in the dark.