

# COVID-19

**Description:** Covid-19 also known as Coronavirus is a kind of common virus that causes an infection in your nose, sinuses or upper throat. Most Corona viruses aren't dangerous.

In early 2019, after a December 2019 outbreak in China, the WHO identified SARSCov-2 as a new type of Coronavirus. The outbreak quick spread around the world.

**Objective:** To know whether there is overall significance of deaths happened due to this pandemic between different countries.

**Data Collection:** The data collected here is about the number of deaths happened due to this disease between the 3 countries(I.e. India, Australia, Germany). The data collected here is **secondary data** since it has been collected from other source (internet).

**Structure of Data:** The data of no. of deaths happened in India, Australia, Germany is given in the table below.

May Month (Dates)	India	Australia	Germany
14	134	0	89
15	100	0	101
16	103	0	57
17	120	0	33
18	157	1	21
19	134	0	72
20	140	1	83
21	132	0	57

## Graphical Representation of Data:

The Multiple bar graph as shown below gives information about the number of deaths occurred due to COVID-19. In countries like India, Australia, Germany in month of may from date(14 to 21).

### Multiple Bar diagram

Syntax for Multiple Bar Graph –

```
India=c(134,100,103,120,157,134,140,132)
```

```
Australia=c(0,0,0,0,1,0,1,0)
```

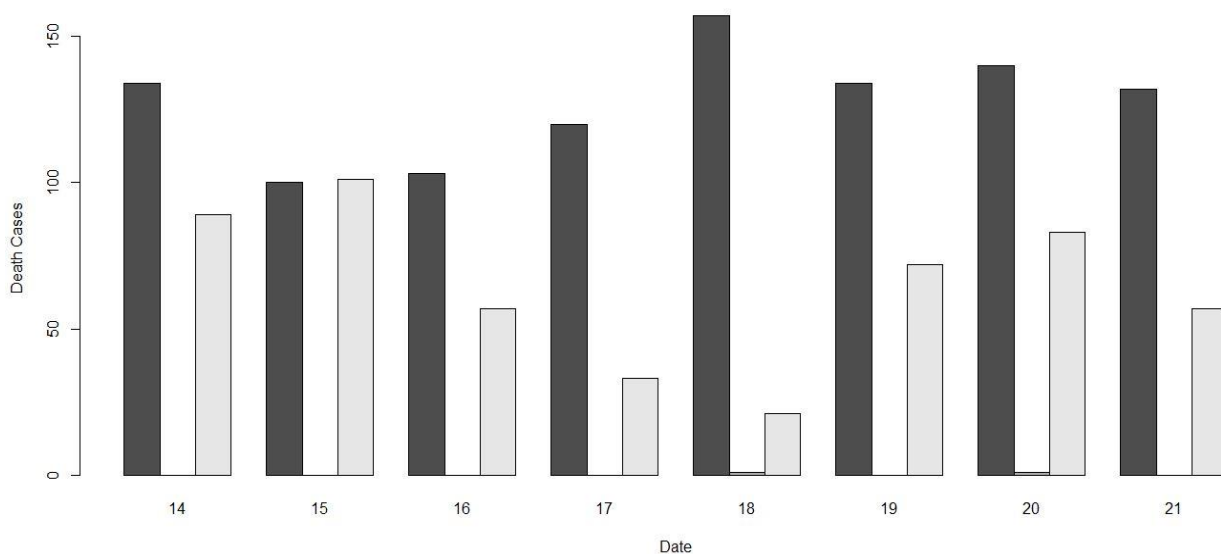
```
Germany=c(89,101,57,33,21,72,83,57)
```

```
Date=14:21
```

```
d=data.frame(India,Australia,Germany)
```

```
dm=as.matrix(d)
```

```
barplot(t(dm),beside=T,names.arg=Date,xlab="Dates",ylab="DeathCases")
```



## Formulation of Hypothesis :

Ho: There is no significant difference between the countries.

H1: There is significant difference between the countries.

## Observation table:

May Month (Dates)	India	Australia	<u>Germany</u>	Total
14	134	0	81	223
15	100	0	101	201
16	103	0	57	160
17	120	0	33	153
18	157	1	21	179
19	134	0	72	206
20	140	1	83	224
21	132	0	57	189
Total	1020	2	513	1535

## Construction of Anova Table:

Source of variation	D.F	S.S	M.S.S	Fcal	Ftab
Days	7	1661.625	227.375	-----	-----
Country	2	64770.5833	32785.29	73.001	3.74
Error	14	6210.75	443.625		
Total	23				

- Since  $F_{2cal} > F_{2tab}$ , so we conclude that there is a significant difference between countries.

### Anova using R software:

Deaths	Countries	Month May(Dates)
134	India	14
0	Australia	14
89, 1	Germany	14
100	India	15
0	Australia	15
101	Germany	15
103	India	16
0	Australia	16
57	Germany	16
120	India	17
0	Australia	17
33	Germany	17
157	India	18
1	Australia	18
21	Germany	18
134	India	19

0	Australia	19
72	Germany	19
140	India	20
1	Australia	20
83	Germany	20
132	India	21
0	Australia	21
57	Germany	21

```

> death_cases=c(134,0,89,100,0,101,103,0,57,120,0,33,157,1,21,134,0,72,140,1,83,132,0,57)
> Countries=c("India", "Australia", "Germany")
> time=c('day1','day1','day1','day2','day2','day2','day3','day3','day3','day4','day4','day4','day5','day5','day5','day6','day6','day6','day7','day7','day7','day8','day8','day8')
> my_data=data.frame(death_cases,Countries,time)
> anova=aov(death_cases~Countries+time,data=my_data)
> summary(anova)

            Df Sum Sq Mean Sq F value    Pr(>F)
Countries    2  64771   32385.5  73.002 3.93e-08 ***
time          7   1662     237.4   0.535  0.794
Residuals   14    6211     444
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
> |

```

Since  $p \text{ value} < 0.5$  we reject  $H_0$  & conclude that there is significant difference between the countries.

## **Summary -**

This project consists a small data of number of deaths happened due to COVID-19 in cities like India, Australia & Germany in month May(from date 14 to 21).The idea is to help capture, summarize, and display accurate information on Coronavirus in a manner that facilitates reading. For this I have represented the data through multiple bar graph using R software so that it can be easily accessible by general people. Also I have calculated data manually using ANOVA(TWO WAY) to check whether there is significant difference between countries or not. I have also performed ANOVA in Rstudio using necessary syntax required. Thus, this project.

## **Experience :**

I haven't done such type of project before so it was a complete new task for me to accomplish. Also got to learn some new things during this process. Few problems faced while doing this activity but I managed to resolve & overcome it. My experience while doing this project was something new. It was good.