

Reliability of Covid Vaccines Using Spss

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Abstract

Better be late than Never. The Government of India is all set and fully equipped and confident to fight and face the challenge that has been spread by the deadly Corona Virus or COVID19. It is with the patience and support of the people that the government is able to slow down the speed of spreading this pandemic of COVID19. It is with people's support and their following of the guidelines issued by the government, that now we the people of India are on the edge of defeating the virus. With the invent of COVID vaccine, the government has setup a milestone that India is capable of getting through with every one or the other situations. But due to certain doubts and questions related to this COVID vaccine, we are trying to find out the reliability of the two vaccines i.e., Covaxin and Covishield in this paper. Different samples and data has been taken into account in order to identify the effect of both the vaccines and calculate its safety and reliability. This calculation has been done with the help of SPSS.

Keywords : COVID 19, Cronbach Alpha, SPSS, T-test, Correlation.

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INTRODUCTION

Since the time, the vaccination drive has been started in the country, there are indeed a lot more questions in the mind of most of the individuals esp. with the safety and reliability of both the

vaccines. Every individual is concerned about the probability of getting COVID infection after getting vaccinated. This paper uses some of the calculation techniques like t test and Cronbach alpha in order to calculate the reliability of the vaccine and probability

of an individual to get an infection after getting vaccinated. Some of the cases taken into consideration includes Total population vaccinated with either of the vaccines (Covaxin or Covishield) number of individuals received first dose, infected without vaccination, number of individuals infected after one dose of vaccination and the number of individuals infected after they get both the doses.

RESEARCH DESIGN

In order to perform the analysis, Quasi Experimental type of Research Designing is being used.

This Research design is used in order to test casual relationships which often involves comparing of the result of pre-existing groups. This type of designing is used since it is conducted in natural environment. Here, we are comparing there liability of two Vaccines COVAXIN & COVISHIELD which are given in a natural environment. These have different effect on different individuals after getting, none, one or both the doses. The table given below represents the above said data comparing the overall doses along with various other dose

Table 1: Data Record of Post Vaccination Breakthrough Infection
(Source: Union Health Ministry)

CATEGORIES	COVAXIN	COVISHIELD
Overall Vaccinations	1.1 Crore	11.6 Crore
First Dose receivers	93,56,436	10,03,02,745
Infected after First dose	4208	17145
% of infected after first dose	0.04%	0.02%
Second Dose Receivers	17,37,178	1,57,32,754
Infected after second Dose	695	5014
% of infected after second dose	0.04%	0.03%

If we analyse the above data, we can see that there is not much difference in the overall percentage of the infected people after vaccination. Rather we can see that more people get infected after their COVAXIN dose.

RESEARCH ANALYSIS

We have performed the analysis of the two vaccine on the statistical software SPSS. The table shown below determines some of the statistical values like Mean, Standard Deviation (SD), Standard Error and variance of both the vaccines i.e., COVAXIN & COVISHIELD. The values determine that there is a large amount of variation in COVISHIELD as compare to the statistical value of COVAXIN.

This could be because the overall vaccinated individuals w.r.t COVISHIELD is far more than that of COVAXIN.

Descriptive Statistics

	N Statistic	Mean		Std. Deviation Statistic	Variance Statistic
		Statistic	Std. Error		
Overall_Vaccinations	2	63500000.0	52500000.0	74246212.0	5.513E+15
First_Dose_receivers	2	54829590.5	45473154.5	64308751.8	4.136E+15
Infected_after_First_dose	2	10676.50	6468.500	9147.840	83682984.5
Second_Dose_Receivers	2	8734966.00	6997788.00	9896366.70	9.794E+13
Infected_after_second_Dose	2	2854.50	2159.500	3053.994	9326880.50
Valid N (listwise)	2				

Now, performing a statistical test i.e., t-test, we get the following output:

One-Sample Test

Test Value = 5

	t	df	Significance		Mean Difference	95% Confidence Interval of the Difference	
			One-Sided p	Two-Sided p		Lower	Upper
Overall_Vaccinations	1.210	1	.220	.440	63499995.0	-6.04E+8	730575744
First_Dose_receivers	1.206	1	.220	.441	54829585.5	-5.23E+8	632620797
Infected_after_First_dose	1.650	1	.173	.347	10671.500	-71518.59	92861.59
Second_Dose_Receivers	1.248	1	.215	.430	8734961.00	-80180366	97650288.0
Infected_after_second_Dose	1.320	1	.206	.413	2849.500	-24589.55	30288.55

Case Processing Summary

		N	%
Cases	Valid	2	100.0
	Excluded ^a	0	.0
	Total	2	100.0

a. Listwise deletion based on all variables in the procedure.

Since the value of $p >$ level of significance i.e., $p \text{ value} > 0.05$

Now, Calculating the value of Cronbach's alpha, we get the following result:

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.697	1.000	5

Here, as we can see the Value of Cronbach's alpha is 0.69. It means the data is Questionable

CONCLUSION

A Pearson Correlation test is being conducted to examine the relationship between the first dose receivers, infected people after first dose, second dose receivers and number of individuals infected after second dose with both COVAXIN and COVISHIELD. It is seen that there is a significant positive relationship between the two types of Vaccines i.e.,

COVAXIN and COVISHIELD, where the Pearson correlation i.e., $r(1) = 1$, $p < 0.001$. Also, a Reliability test is also conducted using Cronbach's alpha where the Reliability comes out to be 0.69. This indicates that 0.69% of the variance in the score is reliable variance and 0.31% is the error variance. This indicates that the internal consistency of the factors are questionable and if taken into account then they may or may not be acceptable.

REFERENCES

- Kerr, J.R.; Schneider, C.R.; Recchia, G.; Dryhurst, S.; Sahlin, U.; Dufouil, C.; Arwidson, P.; Freeman, A.L.J.; van der Linden, S. Predictors of COVID-19 vaccine acceptance across time and countries. medRxiv 2020.
- Freeman, D.; Loe, B.S.; Chadwick, A.; Vaccari, C.; Waite, F.; Rosebrock, L.; Jenner, L.; Petit, A.; Lewandowsky, S.; Vanderslott, S.; et al. COVID-19 vaccine hesitancy in the UK: The Oxford coronavirus explanations, attitudes, and narratives survey (Oceans) II. Psychol. Med. 2021, 1–15.
- Quinn, S.C.; Jamison, A.M.; Freimuth, V. Communicating Effectively About Emergency Use Authorization and Vaccines in the COVID-19 Pandemic. Am. J. Public Health 2021, 111, 355–358.
- Cohen, A.F.; van Gerven, J.; Burgos, J.G.; de Boer, A.; Foucher, R.A.M.; Flore, H.; Teitelbaum, Z.; van Eden, W.; Webb, A.; Cremers, S. COVID-19 vaccines: The importance of transparency and fact-based education. Br. J. Clin. Pharmacol. 2020, 86, 2107–2110.
- WHO Coronavirus Disease (COVID-19) Dashboard. Geneva: World Health Organization; 2021 (<https://covid19.who.int/>, accessed 2 March 2021).
- WHO Coronavirus Disease (COVID-19) Dashboard. Geneva: World Health Organization; 2021 (<https://covid19.who.int/>, accessed 2 March 2021).