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A Statistical Study on Impact of Coronavirus on Worldwide

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ABSTRACT:
This article describes the statistical impact of Coronavirus worldwide. The data about the impact of this virus was collected. The relations were obtained between active cases, deaths and recoveries. Statistical tools were also used in the analysis of data.

Keywords: Coronavirus, SARS-CoV-2, Regression, Correlation, ANOVA.

I. INTRODUCTION:

Coronavirus disease 2019 (COVID-19) is a contagious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first case was identified in Wuhan, China, in December 2019. It has since spread worldwide, leading to an on-going pandemic.Symptoms of COVID-19 are variable, but often include fever, cough, fatigue, breathing difficulties, loss of smell and taste. Symptoms begin from one to fourteen days after exposure to the virus. Most people (81%) develop mild to moderate symptoms (up to mild pneumonia), while 14% develop severe symptoms (dyspnoea, hypoxia, or more than 50% lung involvement on imaging) and 5% of patients suffer critical symptoms (respiratory failure, shock, or multiorgan dysfunction).At least a third of the people who are infected with the virus remain asymptomatic and do not develop noticeable symptoms at any point in time, but can spread the disease. Some patients continue to experience a range of effects—known as long COVID for months after recovery and damage to organs has been observed. Multi-year studies are underway to further investigate the long term effects of the disease.

People with the same infection may have different symptoms, and their symptoms may change over time. In people without prior ears, nose, and throat disorders, loss of taste combined with loss of smell is associated with COVID-19 with a specificity of 95.COVID-19 spreads from person to person when virus-containing particles exhaled by an infected person, through respiratory droplets or aerosols, get into the mouth, nose, or eyes of other people who are in close contact with the infected person. During human-to-human transmission, an average 1000 infectious SARS-CoV-2 virions are thought to initiate a new infection.

Closer distances can involve larger droplets (which fall to the ground) and aerosols, whereas longer distances only involve aerosols. The larger droplets may also evaporate into the aerosols (known as droplet nuclei). The virus is not known to spread between rooms over long distances such as through air ducts. Airborne transmission is able to particularly occur indoors, in high risk locations such as restaurants, choirs, gyms, nightclubs, offices, and religious venues, often when they are crowded or less ventilated. It also occurs in healthcare settings, often when aerosol-generating medical procedures are performed on COVID-19 patients.

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was first isolated from three people with pneumonia connected to the cluster of acute respiratory illness cases in Wuhan. All features of the novel SARS-CoV-2 virus occur in related coronaviruses in nature.Outside the human body, the virus is destroyed by household soap, which bursts its protective bubble.

Preventive measures to reduce the chances of infection include staying at home, wearing a mask in public, avoiding crowded places, keeping distance from others, ventilating indoor spaces, washing hands with soap and water often and for at least 20 seconds, practising good respiratory hygiene, and avoiding touching the eyes, nose, or mouth with unwashed hands. Those diagnosed with COVID-19 or who believe they may be infected are advised by the CDC to stay home except to get medical care, call ahead before visiting a healthcare provider, wear a face mask before entering the health care provider's office and when in any room or vehicle with another person, cover coughs and

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sneezes with a tissue, regularly wash hands with soap and water and avoid sharing personal household items.

A COVID 19 vaccine is intended to provide acquired immunity against COVID-19. The numbers of mortality vary by region and over time and are influenced by the volume of testing, healthcare system quality, treatment options, time since the initial outbreak, population characteristics such as age, sex, and overall health. Mortality rates are highly related to age, with relatively low rates for young people and relatively high rates among the elderly.

METHOD OF DATA COLLECTION, APPLICATION AND ANALYSIS:

The data was collected from secondary sources and applied. The secondary sources include the reports of WHO, World meter website. The total cases, recovered cases and number of deaths by country-wise were collected. The collected data were put into the different types of analysis like percentage analysis, regression in Excel sheet.This data iscollected by some sources under the government and applied using certain statistical tools.The data related to the study were fed into a computer and verified in order to eliminate errors.

SAMPLE SIZE AND SAMPLE TECHINQUES:

The sample of the present data is collected from the secondary data that means the data is already collected by one or more person. By using that data, we analyse the affected case percentage and the recovered percentage.

DATA COLLECTION TOOLS:

The collected data are put into the analysis through various ways such as:

REGRESSION:

This table provides the R and R square values. The R value represents the simple correlation and is 0.977, which indicates a high degree of correlation. The R square value (the "R Square" row) indicates how much of the total variation in the dependent variable, which can be explained by the independent variable. In this case, 95.4% can be explained, which is very large.

SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.977017907
R Square	0.954563991
Adjusted R Square	0.949515546
Standard Error	31768.89969
Observations	11

The next table is the ANOVA table, which reports how well the regression equation fits the data

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	1.90832E+11	1.90832E+11	189.0808	2.4E-07
Residual	9	9083366887	1009262987		
Total	10	1.99916E+11			

This table indicates that the regression model predicts the dependent variable significantly well. Here, p is greater than 0.05 and indicates that overall, the regression model statistically significant.

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	22170.98733	12956.41257	1.711198005	0.121205	-7138.45	51480.43	-7138.45	51480.43
Death	0.01718429	0.001249706	13.75066463	2.4E-07	0.014357	0.020011	0.014357	0.020011

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Regression and ANOVA for recovered

Multiple R	0.971361582
R Square	0.943543322
Adjusted R Square	0.937270358
Standard Error	1444920.89
Observations	11

This table provides the R and R square values. The R value represents the simple correlation and is 0.971, which indicates a high degree of correlation. The R square value (the "R Square" row) indicates how much of the total variation is in the dependent variable, whichcan be explained by the independent variable. In this case, 94.3% can be explained, which is very large. The next table is the ANOVA table, which reports how well the regression equation fits the data.

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	3.14034E+14	3.14034E+14	150.4143	6.39E-07
Residual	9	1.87902E+13	2.0878E+12		
Total	10	3.32825E+14			

This table indicates that the regression model predicts the dependent variable significantly well. Here, p is greater than 0.05 and indicates that overall, the regression model statistically significant. The coefficients table provides us with the necessary information to predict recovered from total cases.

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	518695.68	589286.73	0.8802	0.401	-814	185	-814	185
Recovered	0.697	0.05683	12.26	6.39E-07	0.568	0.825	0.568	0.825

CORRELATION:

	TOTAL CASES	**TOTAL DEATHS**	**TOTAL RECOVERED**	**ACTIVE CASES**
Total cases	1			
Total deaths	0.977017907	1		
Total recovered	0.971361582	0.938051569	1	
Active cases	0.859722469	0.861283105	0.713769528	1

A correlation was run to access the relationship between total cases and total deaths. There is a strong positive correlation between total cases and total deaths (r=0.97),total cases and total recovered (r=0.97) and total cases and active cases (r=0.85).

ANOVA: Single Factor

A one way ANOVA is used to compare two means from two independent groups.
Null hypothesis: There is no difference between the total affected cases, total deaths, total recovered cases and active cases.
Alternative hypothesis: There is a difference between the total affected cases, total deaths, total recovered cases and active cases.
$\alpha = 0.05$

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SUMMARY				
Groups	**Count**	**Sum**	**Average**	**Variance**
Total cases	11	76793929	6981266.273	6.46232E+13
Total deaths	11	1563530	142139.0909	19991559751
Total recovered	11	59238606	5385327.818	3.32825E+13
Active cases	11	15991793	1453799.364	7.13746E+12

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	3.4249E+14	3	1.14163E+11	4.34647162	0.00964	2.83874
Within Groups	1.05063E+15	40	2.62658E+13			
Total	1.39312E+15	43				

P-value is less than alpha value 0.05, so we reject null hypothesis and accept alternative hypothesis. There is a difference between the total affected cases, total deaths, total recovered cases and active cases.

II. CONCLUSION:

To curb the crisis, we are advised to follow basic guidelines such as, frequent hand washing, using disinfectants, following cough etiquette, and using facemask. Recent studies suggest that masks could slow down the disease transmission. A study reported that DIY masks made of four-layer kitchen paper and one-layer cloth could block 95.15% of the virus in aerosols, while surgical mask and N95 mask could block up to 97.14% and 99.98%, respectively. However, unless one is sick, it is not recommended to use surgical masks or N95s, which are valuable resource for front-line healthcare workers.

1. The regression model predicts the dependent variable significantly well. Here, p is greater than 0.05 and indicates that overall, the regression model statistically significant
2. There is a strong positive correlation between total cases and total deaths (r=0.97), total cases and total recovered (r=0.97) and total cases and active cases (r=0.85).
3. P-value is less than alpha value 0.05, so reject null hypothesis and accept alternative hypothesis. There is a difference between the total affected cases, total deaths, total recovered and active cases.

REFERENCE:

[1]. Coronaviridae Study Group of the International Committee on Taxonomy of Viruses. The species severe acute respiratory syndrome-related coronavirus: classifying 2019-nCoV and naming it SARS-CoV-2. Nat Microbiol. 2020 Apr;5(4):536-44.
[2]. World Health Organization. COVID-19 clinical management: living guidance. 2021 [internet publication].
[3]. National Institutes of Health. Coronavirus disease 2019 (COVID-19) treatment guidelines.2021 [internet publication].
[4]. Novel Coronavirus Pneumonia Emergency Response Epidemiology Team. The epidemiological characteristics of an outbreak of 2019 novel corona virus diseases (COVID19) in China [inChinese].Zhonghua Liu Xing Bing XueZaZhi. 2020Feb17;41(2):14551.
[5]. Colaneri M, Sacchi P, Zuccaro V, et al. Clinical characteristics of coronavirus disease (COVID-19) early findings from a teaching hospital in Pavia, North Italy, 21 to 28 February 2020. Euro Surveill. 2020 Apr;25(16).
[6]. Docherty AB, Harrison EM, Green CA, et al. Features of 20133 UK patients in hospital with covid-19 using the ISARIC WHO clinical characterisation protocol: prospective observational cohort study. BMJ. 2020 May 22;369:m1985.
[7]. CDC COVID-19 Response Team. Severe outcomes among patients with coronavirus disease 2019 (COVID-19): United States, February 12 - March 16, 2020. MMWR Morb Mortal Wkly Rep. 2020 Mar 27;69(12):343-6.
[8]. LeidmanE,DucaLM,OmuraJD,etal. COVID-19trendsamongpersonsaged0-24 years: United States, March 1-December 12, 2020. MMWR Morb Mortal Wkly Rep 2021 Jan 22;70(3):88-94.

[9]. Viner RM, Mytton OT, Bonell C, et al. Susceptibility to SARS-CoV-2 infection among children and adolescents compared with adults: a systematic review and meta analysis. JAMA Pediatr. 2021 Feb 1;175(2):143-56.
[10]. Li B, Zhang S, Zhang R, et al. Epidemiological and clinical characteristics of COVID-19 in children: a systematic review and meta-analysis. Front Pediatr. 2020 Nov 2;8:591132.