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Covid-19 cases, deaths, recoveries during lockdown (full, smart, semi smart), and effect of lockdown in Pakistan

Abstract

In this research, an endeavor was constructed to realize the suppliable and effectiveness of lockdown in different provinces of Pakistan (KPK, Sindh, ICT, Punjab). And the detailed study of the association of different variables with lockdowns and predicts the number of confirmed cases, deaths and recoveries caused by coronavirus 2 (SARS-CoV-2) during No lockdown, Full lockdown, Smart lockdown, and Semi-smart lockdown and for further analysis one way analysis of variance was used to compare the difference between the mean number of cases, deaths, and recoveries for all provinces. This study used secondary data and analyzed quantitatively the lethal effects of the widespread through the investigation of cases, deaths, and recoveries on the 4 most-affected provinces of Pakistan. The data was collected from the website; www.covid.gov.pk, during the period from 13 March 2020 to 17 March 2021. All the graphs were made in Excel using the SPSS programming, it is best for statistical analysis. The daily change in cases, deaths, and recoveries for all provinces was considered. Combined analysis deaths (10% in No lockdown, 20% in Full lockdown, 48% in Smart lockdown and 22% in Semi-smart lockdown) and recoveries (68% is recoveries occur and 32% does not occur) for comparison deaths and separate analysis for the detailed study were both taken for every province. The GOP every province must be severe too thoughtful to all people of Pakistan while build the strategy. It was found that coronavirus cases death rate was relatively low in Full lockdown. In Smart lockdown and Semi-smart lockdown, the coronavirus cases and death rate were high, because shops were open, business and transport were not closed. The experiment demonstrated that the lockdowns were effective.

Keywords: covid, lockdown, death, cases, recoveries, Pakistan

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Introduction

The world is confronting a viral irresistible disease brought about by severe acute respiratory syndrome Coronavirus 2 (SARS-CoV-2), at first identified in the Wuhan city of China in December 2019, spreading across all landmasses of the world and it was named COVID-19 (WHO, 2020).[1] The word corona signifies "crown," and when inspected almost, the round infection has a "crown" of proteins called peplomers jutting away from its middle in each bearing (WHO, 2020; NHB, 2020).[2] It is primarily spread between individuals through respiratory beads from coughs also, sneezes, and sometimes watery diarrhea (Campbell, 2020; CDC, 2020).[3] Coronavirus is not first occurred it is the third disease after the severe acute respiratory syndrome (SARS-CoV) in 2002 and the Middle East respiratory syndrome (MERS-CoV) in 2012. The SARS and MERS fertility rate are high compared to Covid-19, but the spread is less. Worldwide 8098 were infected and 774 died people from SARS disease with a fertility rate is 9.6%. MERS 2494 absolute confirmed cases and 858 reported deaths with a 34.4% fertility rate.[4]

Coronavirus first two cases were reported on February 26, 2020, in Karachi Pakistan, within 3 days three more cases occurred from the different areas around the country and there was no interaction between these infected people. Slowly, increased cases until 14 April the cases were 5,716 with more cases of Punjab 2,826, 1454 cases have occurred in Sindh, 800 cases in KPK, 233 cases in Gilgit-Baltistan, 231 cases in Baluchistan, 131 cases in Islamabad, and 43 cases in Azad Jammu Kashmir severely. The Recovered were to be 1378 and 96 were dead.[5] With no vaccine available at that time, the only way to control and stop the virus was by lockdown and social spacing. Pakistan-wide full lockdown on 24 March 2020 until was more than one month continue. The main reason for the spread of the coronavirus in Pakistan is 7000 people returning from Iran. People returned from Iran which 1433 have been testing positive on 4 May 2020.[6] The absolute number of confirmed cases reached 12,731,015 and 565,376 deaths occurred over a 6th months duration of time.[7] China announces a Full lockdown at Wuhan city for over two months and controls the coronavirus.[8] Pakistan, being a helpless nation was/isn't in a situation to go for a particularly extensive complete lockdown for such a significant stretch of time. Consequently, Pakistan has organized and managed a complete lockdown for fifteen days. After 15 days the complete lockdown converts to partial lockdown. In partial lockdown school, college, university, air transport, gym, marriage hall, and another unessential were closed. And then imposed smart lockdown after the partial lockdown.[9] Lockdown, track down, and case segregation are measures that have been demonstrated to be powerful in controlling an outbreak.[10]

The virus spread to 200 countries and millions of people were infected around the universe. The only solution to develop vaccine and lockdown imposed.[11, 12] Pakistan was the second hit country in South Asia and 14 highest cases, deaths count Universally.[13] The first coronavirus cases in Pakistan on 26 February 2020, the one infected person from ICT and another from Karachi. In the next fifteen days, the virus spread around the country with 20 confirmed deaths and 470 cases reported. At that time the highest cases were in Sindh.[14] The people returned from Iran, Syria, and London which have positive tests. At the end of august 2020, the virus spread around 30,000 cases and 6000 deaths. Then again government lockdown imposed called smart lockdown, and the United States imposed targeted lockdowns.[15] The highest cases of province Sindh 14, 5 in GB, 1 in Baluchistan. The overall infected people traveled from Iran, Syria, and London.[16] And one more reason

of the fast increase of Covid-19 cases and deaths is the God-fearing people assembly at Raiwind, Lahore in early March. Around 80000 to 1250000 individuals participated out to which 3000 were strangers from different countries.[17] HMO of Pakistan get hold of some steps to control the increase of virus, by syndromic warm screening at purpose in passages isolating explorers at borders connected to Iran and Afghanistan, travel limitations including establishing line control by the suspension of every worldwide flight, and burden of a severe country-wide lockdown as a danger relief measure.[16,18] The government of Pakistan closed schools, colleges, and universities all over the country on 13 March 2020.[19] The total confirmed cases in Pakistan were 246,351, and 5,123 deaths on 11 July 2020.[20] On August 5, 2020, the number of confirmed deaths cases was 6035.[21] A total number of 308208 positive confirmed cases and a total number of confirmed deaths were 6437 have been reported on 24 September 2020 in Pakistan. Surprisingly, our country is 128th in the Covid-19 positive cases list and 13th in Covid-19 deaths per a population of one million.[22] Lockdown, track down, and case segregation are measures that have been demonstrated to be powerful in controlling an outbreak.[10] Therefore, the government of Pakistan imposed a comprehensive lockdown to control Covid-19 cases and deaths.[16] However, the lockdown was lifted in the first seven days of May 2020. The WHO re-imposed a partial lockdown on 10 June 2020, but the prime minister rejected it.[23] He demands that the people could not live more lockdown with job dropping and raising numbers of hungry individuals.[24] A review by Imperial College London had forecast by different calculations that Pakistan would report the biggest number of deaths on the tenth of August 2020 with the complete arriving at 78515 after which Pakistan would observe a decay.[25] Up to till no one compared the death rate of different provinces of Pakistan and different lockdown stages (no, full, smart, and semi-smart lockdown) will no one check of different variables (cases, deaths, and recoveries) association with different types of lockdowns between lockdown and a different variable. The current study was attempted to Check the association of different provinces with recoveries and check the difference in average death rate at different lockdowns (no, full, smart, and semi-smart lockdown).

Materials and methods

Study area

In this research paper, the detailed study of the association of different variables with lockdown and predicts the number of confirmed cases, deaths, and recoveries caused by coronavirus during No lockdown, Full lockdown, Smart lockdown, and Semi-smart lockdown. The pandemic through the study of cases, deaths, and recoveries on the four most-affected provinces of Pakistan. (Kpk, Sindh, Islam Abad, Punjab). The daily change in cases, deaths, and recoveries from 13 March 2020 to 17 March 2021, for four provinces were considered. The coronavirus first cases occurred on 26 February 2020 in Pakistan. But the cases were very few and there was no lockdown at that time. Consequently, the data collected in this study ranged from 13 March 2020 to 17 March 2021. In that time Pakistan reported (77,443 absolute confirmed cases, 71,297 Recoveries, 2,188 deaths in Province KPK), Province Sindh (262,207 confirmed cases, 4,469 deaths, 253,237 recoveries), Province Punjab (191,186 confirmed cases, 5,896 deaths, 174,269 recoveries), and Islamabad (49,476 confirmed cases, 531 deaths, 44,828 recoveries).

Data collection

This study used secondary data of Covid-19 cases, deaths, and recoveries. The data was collected from a website (https://www.covid.gov.pk). We collected data during the period of 13 March 2020 to 17 March 2021.

Study design

The data collected were coded, tabulated, and analyzed using statistical packages (SPSS 2013; 23 version). The data were analyzed using the Chi-square ($\chi 2$) test, Descriptive, one-way Analysis of variance (ANOVA), and Multiple comparisons between the various province of Pakistan. All the graphs were made by Excel.

Different phase of lockdown

a. Full lockdown

Everything was closed in full lockdown.

b. Smart lockdown

Medicine, Grocery, and essential items shop shall remain open 24/7. All other shops open only from 10:00am to 07:00pm. Businesses, education, tourism, marriage hall, sports, gym, courts, and transport. On 09 May 2020, all shops and businesses open 5 days a week from 8:00 to 8:00pm.

c. Semi or micro smart lockdown

Marriage hall, gym, tourism, School, Colleges, University, and air transport closed in semi-smart lockdown.

Lockdown in different province

a. Kpk lockdown

i. Full lockdown was imposed on 21 March to 15 April 2021.
ii. Smart lockdown starts from 15 April 2020 to October.
iii. Micro smart lockdown starts after the smart lockdown.

b. Punjab lockdown

i. Full lockdown will be imposed on 24 March 2020, till 14 April 2020.
ii. Smart lockdown imposed on 28 April 2020, to till 05 Aug 2020.
iii. Semi smart lockdown imposed on 12 October 2020 and continue for a long time.

c. Sindh lockdown

i. Full lockdown imposed on 14 March 2020, in Karachi to till 30 April 2020.
ii. Smart lockdown imposed on 10 May 2020 to till 15 July 2020.
iii. Micro Smart lockdown imposed on 01 October 2020.

d. Islamabad lockdown

i. Complete lockdown from 25 March to 15 April 2020.
ii. Smart lockdown imposed on same day 15 April 2020.
iii. Mini smart lockdown imposed on 11 October 2020.

Results and discussion

The analysis of coronavirus 2 (SARS-CoV-2), the number of confirmed cases, the number of deaths, the number of recoveries with No lockdown, Full lockdown, Smart lockdown, Semi-smart lockdown in Province KPK, Punjab, Sindh, and Islamabad. Both separate analysis and combined analysis of the provinces. The result shows that the lockdown is effective.

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Combined analysis

The performance of each province's deaths and recoveries are defined combinedly in various lockdowns.

Total deaths

The results showed that 10% of deaths occur in No lockdown, 20% in Full Lockdown, 48% in Smart lockdown, and 22% in Semi-smart lockdown. The death ratio is less in No lockdown because the COVID-19 first entered in Pakistan Feb 2020, so No lockdown represents Feb 2020 to 13 March 2020. Another reason is that cases are very few at that time. The ratio of death in Full lockdown is normal because everything is closed in Full lockdown and there is no interaction between individuals except family members. The number of deaths in Smart lockdown is very high since the lockdown is half and more interconnection of people. The quantity of death is again decreased in Semi-smart lockdown because people were vaccinated (Figure 1).

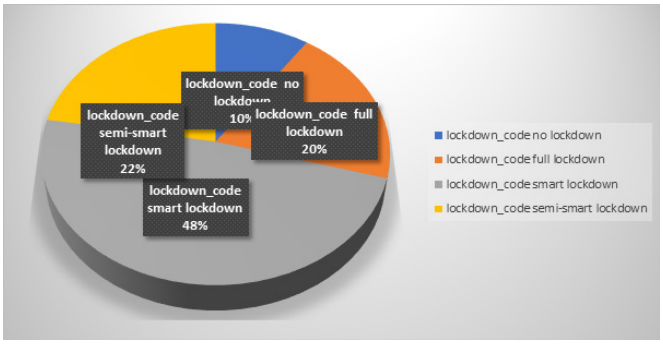

Figure 1 Deaths in different kinds of lockdown.

Total recovered

The following figure shows that 68% of patients recovered from the coronavirus 2 (SARS-CoV-2), and 32% of patients don't recover. Pakistan involves in top highest countries of COVID-19 cases, but surprisingly the more infected people were recovered (Figure 2).

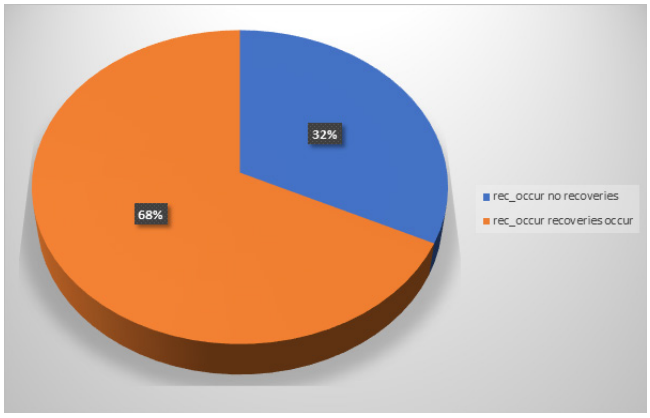

Figure 2 Covid-19 recoveries in all over Pakistan

Separate analysis

The results of each Province with coronavirus cases, deaths, and recoveries analyzed are separately in different lockdowns.

Total deaths

The following figure displays the segregated result in the provinces (KPK, Sindh, Islamabad, Punjab). The first 2 cases occurred in Pakistan 1 infected person from Karachi and another from Islamabad/ so the death rate is high in Islamabad in No lockdown, Full lockdown, Smart lockdown, and decrease in Semi-smart lockdown. The second highest cases were Punjab in Smart lockdown because Punjab are a longer population. The number of deaths in KPK, Sindh is almost the same and high at Semi-smart lockdown in all Pakistan (Figure 3).

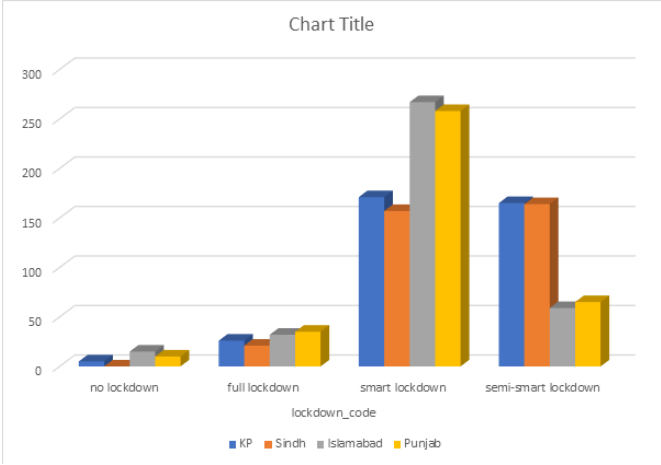

Figure 3 Deaths in KPK, Sindh, ICT and Punjab with different lockdowns.

Total recovered

The following figure shows total recoveries of infected people by Coronavirus before lockdown, within lockdown, and after the lockdown. During No lockdown, Full lockdown the recoveries are slighter and Smart lockdown and Semi-smart lockdown the recoveries are high. The reason is that before the lockdown and Full lockdown the coronavirus spread was slow in Pakistan so recoveries will be also less. Smart lockdown and Semi-smart lockdown virus infected more people the 68% is recovered and 32% is dies (Figure 4).

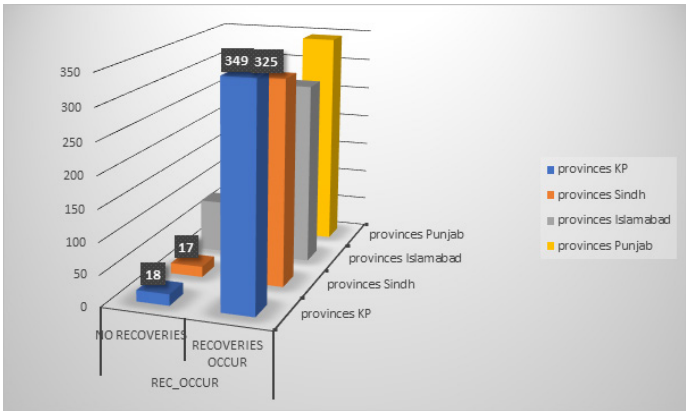

Figure 4 Recoveries in KPK, Sindh, ICT and Punjab with different lockdowns.

Mean of cases, deaths, and recoveries

The following three-figure extremely define mean of cases, deaths, and recoveries with No lockdown, Full lockdown, and Semi-smart lockdown in Pakistan. Figure 5 shows that mean of cases less in No lockdown, then slowly high in Full lockdown. The cases are very firstly high in Smart lockdown and small change in Semi-smart lockdown. Figure 6 defines the mean of deaths in No, Full, and Smart lockdown are Same to cases graph (Figure 5), but deaths are fewer than cases. Then slowly decrease in Semi-smart lockdown. Figure 7 showed that the recovery change is moderate in Full lockdown and before the Full lockdown is compared to cases and deaths. In Smart

lockdown, the recovery speed is high, because a lot of people were infected at that time. Then again decrease the speed of recovery in Semi-smart lockdown, and the result of one-way ANOVA showed in appendix that there is highly statistically significant difference among the mean of cases, death and recoveries in four groups (NO, full, smart and semi smart lockdown) with p value is less than 0.05 (i.e., p=0.000).

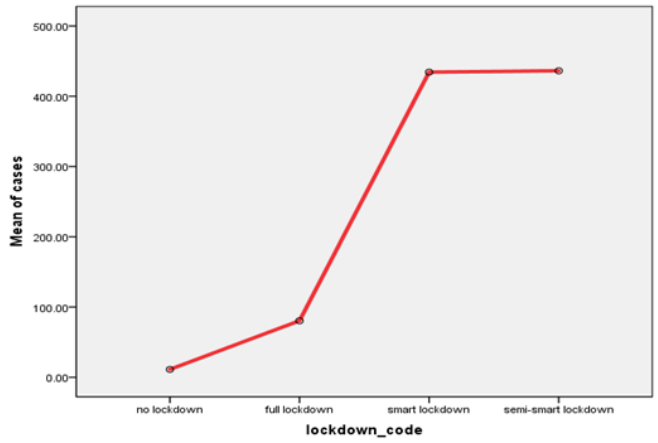

Figure 5 Total cases of mean in all over Pakistan during various lockdown.

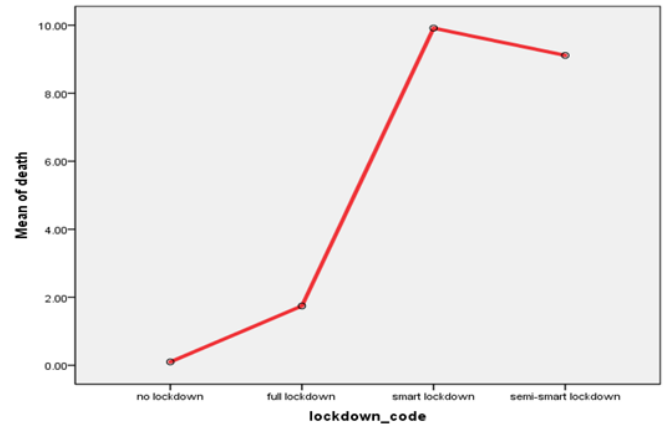

Figure 6 Total deaths of mean in all over Pakistan during various lockdown.

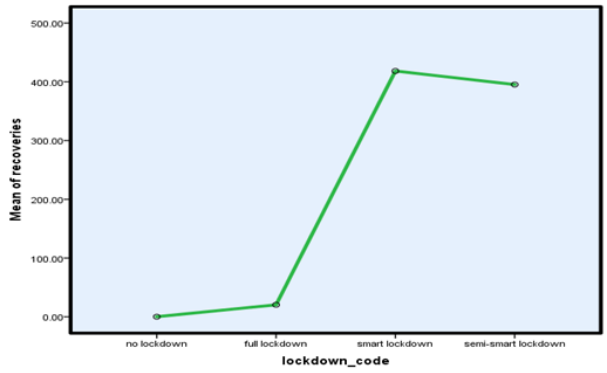

Figure 7 Total recoveries of mean in all over Pakistan during various lockdown.

Conclusion

This study talks about the spread of coronavirus 2 (SARS-CoV-2) in various provinces of Pakistan (KPK, Sindh, ICT, Punjab), and proposed an association between lockdowns (No lockdown, Full lockdown, Smart lockdown, and Semi-smart lockdown). The investigation demonstrates that the lockdowns were effective. It was found that in coronavirus cases, the deaths rate was comparatively low in Full lockdown. In Smart lockdown and Semi-smart lockdown as the detail results are shown in the appendix (the result showed that there is highly statistically significant difference among the mean of cases, death, and recoveries in four groups (NO, full, smart, and semi smart lockdown), the multiple comparison of cases, death and recoveries in no lockdown, full lockdown, smart lockdown, and semi smart lockdown. In group 1 the cases result show that in no lockdown and full lockdown the mean is same and mean of smart lockdown and semi smart lockdown is also same, because the p value is greater than 0.05 (0.885). and other results in group 1 are strongly significant, because the p value is less than 0.05 (0.000). the process is same in group 2 (death) and group 3 (recoveries). The coronavirus cases and deaths rate are high because shops are open, business and transport are not closed. The lockdowns where helpful so additionally performance can be very well appropriately, and the equitable pace can get hold also balance (the SARS-CoV-2) Cases and deaths.

Appendix

Table 1 Total cases, death and recover in no, full, smart, and semi smart lockdown

		N	Mean	Std. deviation	Std. error	95% Confidence interval for mean		Minimum	Maximum
						Lower bound	Upper bound		
cases	no lockdown	30	11.2667	19.0642	3.48063	4.148	18.3854	0.00	73
	full lockdown	114	80.4912	163.1089	15.27655	50.2256	110.7568	0.00	1411
	smart lockdown	853	434.306	518.4451	17.75122	399.4647	469.1472	0.00	3038
	semi-smart lockdown	453	436.223	410.8401	19.30295	398.2883	474.1576	0.00	2013
	Total	1450	398.3352	474.3819	12.45788	373.8978	422.7726	0.00	3038
death	no lockdown	30	0.1	0.40258	0.0735	-0.0503	0.2503	0.00	2
	full lockdown	114	1.7456	3.6014	0.3373	1.0774	2.4139	0.00	30
	smart lockdown	853	9.9156	12.72266	0.43562	9.0606	10.7706	0.00	79
	semi-smart lockdown	453	9.1126	10.00213	0.46994	8.189	10.0361	0.00	58
	Total	1450	8.8193	11.56041	0.30359	8.2238	9.4148	0.00	79
recoveries	C	30	0.1667	0.59209	0.1081	-0.0544	0.3878	0.00	3
	full lockdown	114	20.4211	55.66873	5.21385	10.0915	30.7506	0.00	389

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Table Continued...

	N	Mean	Std. deviation	Std. error	95% Confidence interval for mean		Minimum	Maximum
					Lower bound	Upper bound		
smart lockdown	853	418.4267	1055.69	36.14612	347.4808	489.3726	12	14027
semi-smart lockdown	453	395.2936	555.415	26.09567	344.0097	446.5775	0.00	6952
Total	1450	371.2545	875.1006	22.98127	326.1744	416.3346	0.00	14027

Table 2 ANNOVA

		Sum of squares	Df	Mean square	F	Sig.
Cases	Between Groups	1.78E7	3	5921818.376	27.773	0.00
	Within Groups	3.08E8	1446	213219.112		
	Total	3.261E8	1449			
Death	Between Groups	9049.156	3	3016.385	23.628	0.00
	Within Groups	184599.504	1446	127.662		
	Total	193648.659	1449			
recoveries	Between Groups	2.03E7	3	6774221.506	8.992	0.00
	Within Groups	1.089E9	1446	753335.469		
	Total	1.110E9	1449			

Table 3 Tukey HSD multiple comparison

Dependent Variable		(I) lockdown code	(J) lockdown code	Mean difference (I-J)	Std. error	Sig.	95% Confidence interval	
							Lower bound	Upper bound
dimension1	Cases	no lockdown	full lockdown	-69.2246	94.75044	0.885	-312.9247	174.4756
			smart lockdown	-423.03931*	85.77452	0.000	-643.6532	-202.4254
			semi-smart lockdown	-424.95629*	87.05163	0.000	-648.8549	-201.0577
		full lockdown	no lockdown	69.22456	94.75044	0.885	-174.4756	312.9247
			smart lockdown	-353.81475*	46.04679	0.000	-472.2481	-235.3814
			semi-smart lockdown	-355.73173*	48.38414	0.000	-480.1768	-231.2867
		smart lockdown	no lockdown	423.03931*	85.77452	0.000	202.4254	643.6532
			full lockdown	353.81475*	46.04679	0.000	235.3814	472.2481
			semi-smart lockdown	-1.91698	26.84485	1.000	-70.9625	67.1286
		semi-smart lockdown	no lockdown	424.95629*	87.05163	0.000	201.0577	648.8549
			full lockdown	355.73173*	48.38414	0.000	231.2867	480.1768
			smart lockdown	1.91698	26.84485	1.000	-67.1286	70.9625
	Death	no lockdown	full lockdown	-1.64561	2.31846	0.893	-7.6087	4.3175
			smart lockdown	-9.81559*	2.09883	0.000	-15.2138	-4.4174
			semi-smart lockdown	-9.01258*	2.13008	0.000	-14.4912	-3.534
		full lockdown	no lockdown	1.64561	2.31846	0.893	-4.3175	7.6087
			smart lockdown	-8.16998*	1.12672	0.000	-11.0679	-5.272
			semi-smart lockdown	-7.36697*	1.18392	0.000	-10.412	-4.3219
		smart lockdown	no lockdown	9.81559*	2.09883	0.000	4.4174	15.2138
			full lockdown	8.16998*	1.12672	0.000	5.272	11.0679
			semi-smart lockdown	0.80301	0.65687	0.613	-0.8865	2.4925
		semi-smart lockdown	no lockdown	9.01258*	2.13008	0.000	3.534	14.4912
			full lockdown	7.36697*	1.18392	0.000	4.3219	10.412
			smart lockdown	-0.80301	0.65687	0.613	-2.4925	0.8865

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Table Continued...

Dependent Variable	(I) lockdown code	(J) lockdown code	Mean difference (I-J)	Std. error	Sig.	95% Confidence interval	
						Lower bound	Upper bound
Recoveries	no lockdown	full lockdown	-20.2544	178.0994	0.999	-478.3298	437.8210
		smart lockdown	-418.26006*	161.2276	0.047	-832.9409	-3.5792
		semi-smart lockdown	-395.127	163.6282	0.075	-815.982	25.7282
	full lockdown	no lockdown	20.25439	178.0994	0.999	-437.821	478.3298
		smart lockdown	-398.00568*	86.55268	0.000	-620.621	-175.3904
		semi-smart lockdown	-374.87255*	90.94613	0.000	-608.7879	-140.9572
	smart lockdown	no lockdown	418.26006*	161.2276	0.047	3.5792	832.9409
		full lockdown	398.00568*	86.55268	0.000	175.3904	620.621
		semi-smart lockdown	23.13313	50.45941	0.968	-106.6495	152.9158
	semi-smart lockdown	no lockdown	395.1269	163.6282	0.075	-25.7282	815.9820
		full lockdown	374.87255*	90.94613	0.000	140.9572	608.7879
		smart lockdown	-23.1331	50.45941	0.968	-152.9158	106.6495

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Conflicts of interests

The authors declare that there are no conflicts of interest.

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