

COVID-19 Pandemic – Three Months Later

Daniel Benharroch, M.D*

Department of Pathology, Soroka University Medical Center, and Faculty of Health Sciences, Ben Gurion University of the Negev, Beer-Sheva, Israel

Received: September 19, 2021; **Accepted:** September 28, 2021; **Published:** October 01, 2021

Citation: Benharroch D (2021) COVID-19 Pandemic – Three Months Later. *Med Case Rep Ther Stud* 02(01): 34– 39.

Abstract

Subsequent to our investigations on the novel coronavirus, the possible existence of a “second wave” of COVID-19 and its attributes was explored. Identification of nations exhibiting aberrant clinical characteristics was disclosed. The prior classification of the countries scrutinized into A, B, and C groups, is validated herewith, by aligning them in an expending order of mortality per one million inhabitants. The data uncovered at the beginning of our study (22.03.2020), and about three months later (06.07.2020), illustrated a comparison between the first and the second period of the pandemic. Seventeen nations were investigated, highlighting three categories of states. In three countries, a notable disparity of clinical parameters was displayed. A divergence was exhibited with the rate of recovery, the frequency of molecular exams and the number of critical patients, a propensity towards deterioration in the patients’ status, noted at the end of the follow up. The three countries concerned, include the USA, Brazil and Israel. The identity of the first two is far from taking one aback, while the latter might mean for some, an eye-opener.

Keywords: COVID-19; evolution; mortality; recovery; critical patients; deviation; divergence

Introduction

Evidence of a “second wave” of COVID-19, may have followed, at least for some countries, the break succeeding the first outburst. The analysis of a collection of 17 countries reported with COVID-19 in two separate days, spaced out by about a three month-period. In order to realize this goal, a classification of the diverse nations, as introduced previously [1] was readjusted to the present situation. Moreover, the index of states was ranked separately, based on the death rate per one million residents [2].

The objective was to highlight a second period in the pandemic, and the means by which it affects several countries of the planet. In addition, identification of states which departed by two or more parameters from the usual characteristics, was looked for [1]. The changes, ensuing the pause, were tinted by the relaxation in the strict attitude towards the epidemiological precepts, observed during

the quarantine periods and by the certitude that the novel coronavirus had been overwhelmed. Moreover, some states did not reach a pause at all, but most participated in the feasts of the “deconfinement” freedom.

It is expected, therefore, that a comparison between a daily occurrence in the first outburst, with what seems to represent the transition era or even, for some nations, the second wave or outburst, might disclose significant intelligence.

Materials and Methods

The countries selected, adding up to 17, most of which had been studied previously [1–3], included South Eastern Asian nations which had been involved at an early stage of the pandemic; Western European countries, that were hurt severely; and the USA and Brazil, both huge territories.

The data retrieved included the total number of infected patients; the number and proportion of severe-critical patients; the death rate and the number and percent of recovering individuals. Moreover, the number of RT-PCR tests performed in one million inhabitants was noted; death rate per one million residents and the total number of inhabitants in each country. The data were noted twice: once for the date 22.03.2020 and the second for 06.07.2020. Classification in the A, B, C, states groups was adapted from Tables 1–3 in reference [1]. The variables were ranked accordingly and the first period was compared with that obtained at the end of the follow up. The 17 nations were distributed in an increasing order of the death rate per one million residents and the relevant parameters.

Results

Seven nations were classified in group A during the first wave. They displayed limited parameters, including low levels of

recovery. In the second part of the follow up, the variables remained low, except for recovery, which was elevated, justifying the state assignation to group C (Table 1).

Six states were sorted as group B. This was due to their disclosing a high rate of morbidity and mortality. As a rule, two parameters were rated 6% each or more. The second part of the course underlines countries with high death rates, but corresponds to a low number of critical patients. Again, recovery is prominent. While Brazil and Iran were transformed into group C countries, the remainder has persisted as group B countries (Table 2).

Four nations only have been categorized as C group. They are mostly South Eastern-Asian countries, to which Iceland has been added. In the first period, all the variables presented restricted values, except for the healing parameter. In the more recent period, the death rate correlated with the state group: when elevated, it was linked with group B (Table 3).

Table 1: Country group C: Clinical features on March 22nd and on July 6th.

Country (n%)	China	South Korea	Japan	Iceland
Total 22.03	81,054	8,897	1,101	802
Critical pts	1,845 (2.3)	59 (0.66)	49 (4.45)	11 (1.37)
Deaths	3,261 (4.02)	104 (1.17)	41 (3.72)	2 (1.37)
Recovery	72,440 (89.4)	2,909 (32.7)	235 (21.34)	82 (10.22)
Tests/1M	NA	10,509	1,449	109,558
Group (1)	C	C	C	C
Total (2) 06.07	83,557	13,139	19,522	1,866
Critical (2)	5 (0.0059)	15 (0.11)	38 (0.19)	NA
Deaths (2)	4,634 (5.54)	284 (0.022)	978 (5.00)	10 (0.54)
Recovery (2)	78,518 (93.97)	11,848 (90.19)	18,500 (94.7)	1,840 (98.6)
Group (2)	B	C	B	C
Total populat.	1,433,783,691	51,848,059	126,860,301	362,860
Deaths/1M	3.2	5.4	7.7	27
Order	1 st	2 nd	3 rd	4 th

/1M – per one million inhabitants.

Table 2: Country group A – clinical features in two terms.

Country (n%)	Israel	Norway	Turkey	Austria	Germany	Portugal	USA
Total pt	1,071	4,465	10,827	4,474	24,873	5,170	85,612
Critical	18(1.7)	97(2.2)	568(5.3)	10(0.2)	23(0.09)	89(1.72)	2122(3)
Deaths	1 (0.9)	32(0.7)	168(1.5)	16(0.4)	94(0.4)	100(1.9)	1301(1.5)
Recovery	37(3.5)	12(0.3)	162(1.5)	0	266(1.07)	43(0.83)	1868(2)
Tests/1M	21634	33624	13886	79500	20629	137040	22182
Group 1	A	A	A	A	A	A	A
Total 2	30162	8930	205758	18367	197633	44129	2985897
Critical 2	90(0.3)	3(0.034)	1127(.6)	11(.059)	1127(.6)	73(.2)	15997(.5)
Deaths 2	332(1.1)	251(2.8)	5225(2.5)	706(3.8)	9086(4.6)	1620(4)	132610(4.5)
Recover 2	17974(59)	8138(91)	180680(87)	16647(90)	182200(92)	29160(66)	1289836(43)
Group 2	C	C	C	C	C	C	C>B>C
Total pop	9136000	5367586	83154997	8859000	83186719	10260000	328239523
Death/1M	36	47	63	80	109	158	404
Order	5 th	6 th	7 th	8 th	9 th	11 th	13 th

Table 3: Country group B – clinical features in two periods.

Country (n%)	Iran	Brazil	France	Sweden	Italy	Spain
Total	21,638	4,661	16,018	4,028	59,138	28,768
Critical	3509(16.2)	295(6.35)	1746(10.9)	306(7.6)	3000(5.07)	1785(6.2)
Deaths	1685(7.8)	165(9.54)	674(4.2)	146(3.6)	5476(9.3)	1772(6.2)
Recovery	7913(96.5)	127(2.72)	2200(13.7)	16(.4)	7024 (11.88)	2575(8.95)
Tests/1M	NA	1597	16856	11833	36244	41332
Group 1	B	B	B	B	B	B
Total 2	243051	1604585	166960	71419	241611	297625
Critical 2	3201 (1.32)	8318 (0.52)	560(0.34)	124(0.17)	74(.03)	617 (0.2)
Deaths 2	11721(4.8)	64900(4)	29833(17.9)	5420(7.6)	34861(14.4)	28385(9.5)
Recover 2	204083(84)	978615(61)	77060(46)	NA	192108(80)	NA
Group 2	C	C	B	B	B	B
Total pop	82913906	210301591	64810000	10230000	60359546	46940000
Death/1M	141	308	460	529	577	605
Order	10 th	12 th	14 th	15 th	16 th	17 th

In Table 4, the countries are listed in a growing order of mortality per one million inhabitants. The segregation of table 4 into three subgroups highlights a complete correlation is low mortality rate with a state group C (first

category); a near absolute association of an intermediary mortality grade with a country group A (second category), and a strong relation between very high mortality level and the state group B (third category).

Table 4: Assortments of countries – clinical correlations based on mortality per 1M residents, on two terms.

Country	Death Per 1M	Class 1 st > last	Recovery Last FU	Tests/1M	Critical pts 1 st > last
China	3.2	C > B	78,518 (93)	NA	1,845 > 5
S. Korea	5.4	C > C	11,848 (90)	10,509	59 > 15
Japan	7.7	C > B	18,500 (94)	1,449	235>38
Iceland	27	C > C	1,840 (98)	109,558	11 > NA
Israel	36	A > C	17,974 (59.6)	21,634	18 > 90
Norway	47	A > C	8,138 (91)	33,624	97 > 3
Turkey	63	A > C	180,680 (88)	13,886	568 > 1127
Austria	80	A > C	16,647 (91)	79,510	10 > 11
Germany	109	A > C	182,200 (92)	20,629	23 > 1127
Iran	141	B > C	204,083 (84)	NA	3,509 > 3,201
Portugal	158	A > C	29,166 (66)	137,040	89 > 73
Brazil	308	B > C	978,615 (61)	1597	296 >8,318
USA	404	A>B>C	1289836(43)	22,182	2,122 > 15,997
France	460	B > B	77,060 (46)	16,856	1,746 > 560
Sweden	529	B > B	NA	11,833	306 > 124
Italy	577	B > B	192,108 (79)	36,244	3000 > 74
Spain	605	B > B	NA	41,332	1,785 > 617

Table 4, further compares the recovery levels, the PCR tests ratio and the alteration in the number of severe to critical patients, as it relates with the two periods. In a few cases, the percent recovery was low, or it had not been evaluated at all. In several instances, the number of critical patients displayed an inverse trend, from a low to a high value. When consideration was given to two or more aberrations in the same case, three countries were

underlined, the USA, Brazil and Israel which might be expected for the first two territories, but not necessarily so with regard to Israel.

In contrast, China displays different results: its mortality rate is the lowest, and is markedly restrained. RT-PCR tests were not reported; is it because they were not performed? Moreover, only 5 severe-critical patients

were reported in the second part of the pandemic. Could it be an indication that by July, 2020, China had already overcome the pandemic?

Discussion

The present analysis highlights five divergent parameters of the pandemic, displayed by 17 countries which describe a range of features in the course of COVID-19 [1, 2]. Thus, a high mortality per one million inhabitants correlated with country group B, in addition to one or more of three variants with digressive qualities. These variables encompassed either a low rate of recuperation; absence of data on recovery; reduced rate of RT-PCR tests, or an inverse level of critical patients. It is through the integration of two or more of these variables, in a given nation, that an increased risk for a more severe illness is disclosed [3].

Among the divergent factors mentioned, part displays an obvious association with a poor outcome malady. A link between a relatively low rate of healing, or between a growing number of severe-to-critical patients, and a grave ailment is evident and self-explanatory. The association of the rate of tests per million residents, with the illness severity, requires a more elaborate justification. It is of note, that regarding the USA and Brazil, a low range of PCR tests must have contributed to a mediocre disease outcome. Pending their being representative, such low levels of exams may reflect a suboptimal care of the authorities to the involvement of their subjects in the pandemic.

The distribution of the parameters in our limited cohort has rendered the confirmation of our classification of countries, relevant. This was made possible by putting in order the 17 states according to the increasing rate of mortality per million individuals. The analysis displayed an association between the mortality and our classification into state group C (low mortality); country group A (intermediate mortality) and nation group B (high mortality). It is suggested that the group C countries, especially those from South East Asia, had been involved with COVID-19, at least for one - one and a half month before the other countries. This may explain a higher degree of maturity in the evolution of the disease, and thus, a milder and more lenient form of the ailment [4].

The consistency in the ranking of the groups of nations and their stable relationship with the proportional mortality, are possibly suggestive of an association with the virus behavior. The restriction of one country group at a given localization may meet the proposed evidence of certain SARS-CoV-2 mutations to certain countries. It is advanced, that group C or B will represent a mutation, or a group of mutations; and evidence that group A may be preferentially transformed into a group C country, while B progresses to a group B, may be consistent with this principle. Thus, the features of COVID-19 in a given land will tend to differ from that of another, consideration being given to the fact that the genetic aspect of a virus is only one determinant of the illness characteristics.

The remaining variables were scrutinized in a combined manner [5]. A special attention was given to states which cumulated two or more aberrations in the parameters studied. Moreover, it seems that China stands out for the lowest value of mortality of our collection; for a lack of mention of the RT-PCR exams; and for the drift, at the last follow up, to the lowest number of critical patients [6]. This may reflect the high degree of recuperation, underlined in [Table 1](#), concerning this country.

Israel displays a moderate-to-low rate of recuperation, when compared to the collection. In addition, a rise in the number of critical patients became evident within 3 months. An association between the deviation of both these parameters and the rigorous status of COVID-19 in Israel may come as a surprise to some observers.

Brazil discloses several divergences: a high level of mortality; transformation from territory group B to C; a low level of healing; a low degree of RT-PCR tests; and a reverse trend in the severity of the illness at last follow up. The five elements mentioned above with their deviation, might have contributed directly or indirectly, to the tragic medical condition prevailing in July 2020 in that huge country.

The USA displayed a departure from the remaining countries involved, by five sets of deviations in the clinical parameters. For one, its classification is unique, and includes periodically, the three groups (A, B, and C). Moreover, its level of recuperation is the lowest ever and PCR exams were relatively scarce. These breaks from normality might be part of the causes of the persistently

growing deterioration in the condition of COVID-19 in the USA.

Regarding the divergences noted with the five parameters, notably in the four deviant countries, one wonders whether they might represent possible mechanisms leading to failure in preventing the virus progression. A further query would be whether an inverse relationship prevails between deviation in the five parameters and the adherence to the facial mask, to social distancing, and to hygiene. In Israel, notorious departures from the three health precepts, on religious, cultural, social and political grounds, are recurrently reported, and might be blown up at the gates of the international airport, by highly questionable quarantine observances.

This study assesses possible avenues, by which a lack of adherence to the epidemiological principles of behavior, might be translated into divergence of COVID-19 through its different clinical components.

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***Corresponding author:** Prof. Daniel Benharroch, Department of Pathology, Soroka University Medical Center, Rager Blvd., P.O.Box 151, Beer-Sheva 84101, Israel;

Phone: 972-507579140;

E-mail: danielbenharroch1@gmail.com