

# A QUANTITATIVE LOOK AT COVID-19

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## **Abstract**

This paper will tackle COVID-19 from different perspectives with the help of statistical analyses. The very feature of the virus to create respiratory tract conditions, to aggravate the already existing respiratory conditions, and to transmit diseases via air droplets, together with other triggering factors like age and gender, reveals the significance of the dense population of living spaces and hence the importance of sociodemographic advancement. This scenario necessitates the modeling of the analyses to be made not only in the context of health conditions but also on the basis of the above mentioned variable groups and in a multivariate fashion. The study used multivariate decision-making methods, multivariate statistical methods, and quantitative and qualitative desk and field research. To ensure the data continuity and consistency, COVID-19 struggling systems and performances of the selected countries were modeled. The socio-psychological and socioeconomic conditions of the individuals of the selected countries were all at stake during the lockdown periods.

**Keywords:** Statistical analyses, the attitudes and behaviors of individuals, struggle performance scores of countries, forecasting studies

## Introduction

### A Global and Comparative Perspective on the COVID-19 Pandemic

The viral disease that originated in Wuhan, China in December 2019 was named as COVID-19 as it originated from the novel corona virus, which later turned into and was defined as a global pandemic. While the crude death rate was reported to be 2% by the World Health Organization (WHO) on January 29, 2020, it was revised as 3.8% on the basis of the data obtained from 55,954 cases tested by the WHO and China<sup>1</sup>. On March 3, 2020, the crude death rate was revised again as 3.4%, which comprised a significantly high rate in comparison with death rates arising from seasonal diseases, such as seasonal flu and swine flu.

<b>Name of the Pandemic (In the form of Flu Virus)</b>	<b>Fatality Rate (Worldwide %)</b>
<b>COVID-19</b>	3.40 <sup>2</sup>
<b>SARS</b>	9.60
<b>MERS</b>	34.00
<b>Swine Influenza</b>	0.02
<b>Seasonal Influenza</b>	0.10

As of June 2, 2020, the “case fatality rate” (CFR) originating from COVID-19 prevalent in 213 countries was calculated as 11%, while the pandemic severity rate (PSR) was approximately 2%. The number of COVID-19 cases and death toll dramatically changed from the first degree linear form to an exponential function and increased rapidly between March 16 and 18, 2020. That was revised as the second degree linear form and as a parabolic form on April 28 for the world in general. As per the study conducted with 6,839 patients and the COVID-19-related death cases examined per age group on the basis of the presence of underlying conditions, the relationship between the fatality rate and the presence of underlying conditions was statistically significant ( $p \leq 0,05$ ). Table 2 shows that while the fatality rate until the age of 17 is almost non-existent (0,04%), the individuals in the 18–64 age group with no underlying conditions were more careless and had a higher fatality rate as opposed to individuals aged 65+ with underlying conditions, who seemed to have a growing fatality rate due to the combined effect of advanced age and related geriatric factors.<sup>3</sup>

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- 1 Report of the WHO–China Joint Mission on Coronavirus Disease 2019 (COVID-19) [Pdf]—World Health Organization, Feb. 28, 2020
  - 2 It is not a confirmed value.
  - 3 Coronavirus Disease 2019 (COVID-19) Daily Data Summary, New York City Health as of April 14.

**Table 2.** Fatality Distribution of COVID-19 Patients with an Underlying Condition per Age Group (Person and %)

Age Groups (Age)	Deaths (Person)	Fatality Rate (%)	People with Underlying Conditions (Person)	People with Underlying Conditions (%)	People without Underlying Conditions (%)	People with no Information of Underlying Conditions (%)	People with no Information of Underlying Conditions (%)
0–17	3	0.04	3	0.06	0.00	0.00	0.00
18–44	309	4,50	244	4.74	18.25	2.60	1.00
45–64	1,581	23,10	1343	26.07	43.07	11.54	3.50
65–74	1,683	24,60	1272	24.69	18.98	24.82	6.00
75+	3,263	47,70	2289	44.44	19.71	61.06	14.20
<b>Total</b>	6,839	100,00	5151	100.00	100.00	100.00	24.68

The underlying conditions with the highest impact that determine the severity of the disease and/or ultimately lead to death turned out to be cardiovascular diseases, diabetics, chronic respiratory tract diseases, hypertension, cancer, and kidney diseases. Evidently, gender played a key role in getting infected with the virus and the fatality rate as 62% of the dead patients comprised males, whereas 38% comprised females. Studies have revealed that COVID-19 is transmitted by interaction with an infected person through virus-carrying airborne droplets; humidity; airborne particles; and various objects, surfaces, and floors lengthening the life duration of the virus.

## COVID-19 Pandemic Comparative Analyses in the Context of Countries

### Based on Primary and Secondary Data

#### Materials and Methods

##### Desk Research with Quantitative and Qualitative Scopes

There has been an increase in the number of organizations compiling data gathered from different forms of research studies supported by statistical analyses throughout the world, and these data-driven open access platforms also contribute greatly in matters of health. Specifically, data gathered from the WHO and [www.worldometers.info](http://www.worldometers.info) allow researchers to conduct advanced statistical analyses.

The desk research of this study is based upon elaborating the available secondary data with basic and advanced statistical analyses. As per the data obtained on June 02, 2020, out of a population of 1 million, the first 100 countries with two or more patients died due to

COVID-19, where Belgium ranked 1st, the US 9th, and Turkey 30th. When the COVID-19 occurrence rate was examined in the scope of a population of 1 million, the ranking emerged to be 9th for Belgium, 5th for the US, and 32nd for Turkey. This is a considerably simple indicator of how inaccurate ranking countries in accordance with one single variable can be although the comparisons were made on the basis of a population of 1 million. Consequently, this study tackled the performances of countries in terms of their struggles against the COVID-19 pandemic on a multivariate platform while employing the grey relational analysis method (GRAM) as a multi-criterion decision-making method with the idea of reaching robust results to determine the ranking of countries on the basis of their performance rates.

Three major criteria, namely, (i) the reliability of the obtained data, (ii) GNP per person, and (iii) human development index were considered while determining the countries to be included in this analysis. Within the scope of the countries included in the study, no relationship was found to exist between the COVID-19 struggling performance of the country in question and the GNP ( $p \geq 0,05$ ), while a negative and weak relationship was observed between the IGI and the COVID-19 struggling performance ( $R = -0,2602$ ;  $P \leq 0,05$ ). Along the same line, the economic output of the countries has no relationship with their success levels in terms of their struggles against COVID-19.

Surprisingly, the increase in the level of the development of any given country is linked with the decrease in its performance in struggling against COVID-19 (see Graph 1).

In the context of the performance evaluations of the countries tackled in this study, the analyzed factors per country are the following: (i) the first date when the virus was discovered, (ii) the continent where the country is located, (iii) the standardized (S) number of serious patients/active patient ratio performance (P), (iv) S case per population P., (v) S casualty per population P., (vi) S test per population P., (vii) S GNP P., (viii) S health expense amount/ GNP P., (ix) S. highly educated population P., (x) S new case per population P., and (xi) S total healing per population P.

### **Observational Research with Qualitative and Quantitative Scopes**

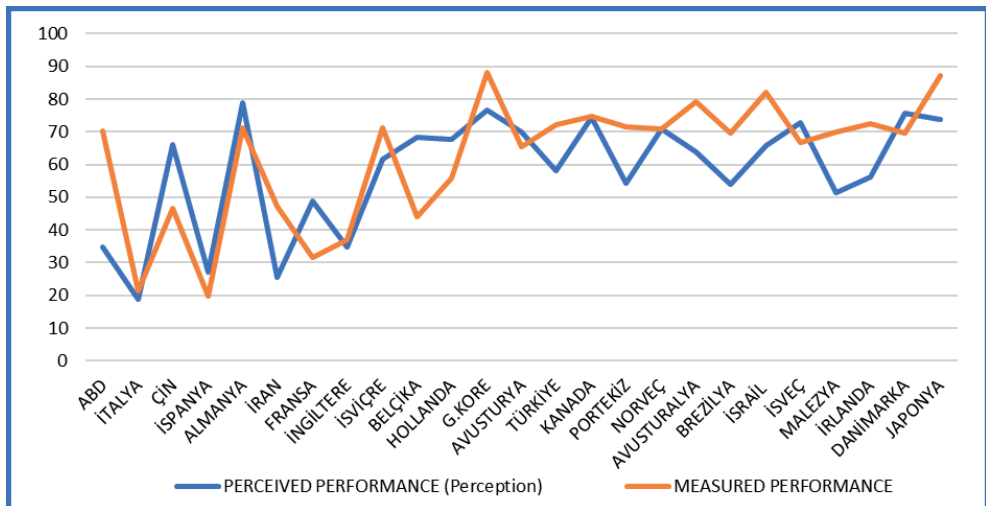
For this study, a twofold field study with qualitative and quantitative research and data gathering methods was conducted to obtain primary data. The perceptions and attitudes of Turkish people toward COVID-19 were examined to compare them with the findings of the desk research within the scope of the study. The goal was to reach strategically important findings on the basis of the comparative analyses and the results of the twofold research conducted.

With the field research, the perceptions of Turkish people regarding the struggles of other countries against COVID-19 were identified. The study was realized with 460+24 households and the same number of individuals residing in Istanbul, Turkey. The quantitative and qualitative interviews were conducted with the CATI and CAWI data gathering methods to examine the individuals face-to-face.

### Findings and Evaluations

The success perceptions and general attitudes and behaviors of the individuals in the context of struggles against COVID-19 were thoroughly examined through desk research. With the help of the findings of the desk research, the COVID-19 struggle performance scores were generated per each selected country to be exposed to further examinations through comparative analyses.

The following graph depicts the “COVID-19 Struggle Performance Scores per Country” generated on the basis of the real data published by each selected country along with the comparative analyses of the field research data.

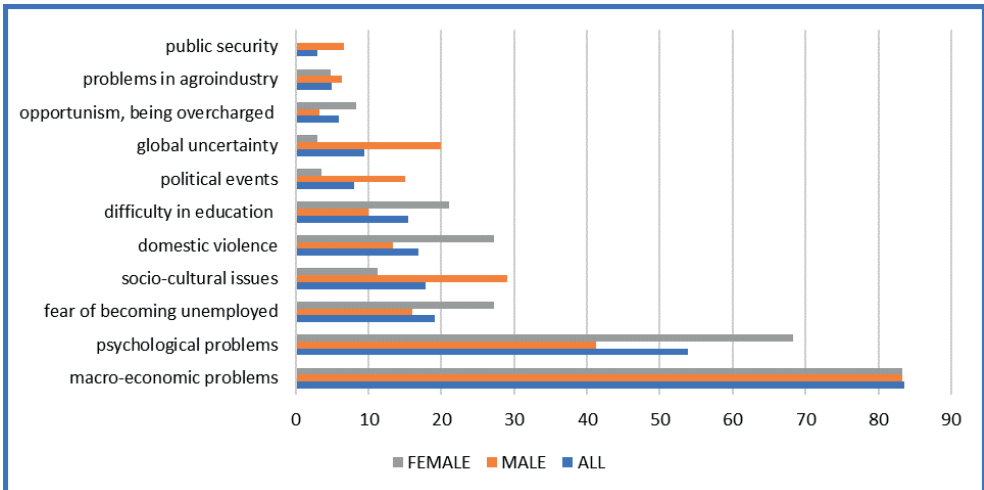


**Graph 1.** Perceived and Measured COVID-19 Struggle Performance Score Comparisons between Selected Countries

Graph 1 depicts that the perceived COVID-19 struggle performance perceptions of Istanbul residents, interviewed within the scope of this study, appeared to be lower than the actual performance scores for the US. In other words, the US appeared to be the only country with the most disappointing COVID-19 struggle performances. In a similar vein, developed countries received higher scores in terms of their perceived performances in comparison with

their actual performances, whereas relatively less developed countries received much lower perceived performance scores in comparison with their actual performance scores. Moreover, the perceived performance score of Turkey remained lower than its actual performance score. In other words, the actual performance score of Turkey turned out to be much higher, with a statistically significant value, than the world average performance score. The study eventually came up with remarkable positive performance scores for countries such as Japan, South Korea, Israel, Australia, Turkey, and Canada.

The desk research also enabled the researcher to examine the prevalent perceptions regarding the “balanced quarantine” period experienced in Turkey along with the related social and individual issues. These examinations were furthered to look into the issue on the basis of gender and some related sub-categories (see Graph 2).



**Graph 2.** *Social and Individual Problems Felt/Perceived during the Balanced Quarantine Period (%)*

Seventy-two percent of the households interviewed throughout the study comprised individuals who kept on working outside of their dwelling either on full-time/part-time or in an alternating mode, except for those who are pensioners and unemployed. Furthermore, out of an average of 56% of these residences, at least one individual goes outside every day. The samples of the study (interviewed individuals) did not have any concern as to maintaining the public order while the social distancing measures and the “Turkey; Stay-at-Home” order was in place, apart from a small number of the female respondents who mentioned their concerns regarding corruption, being overcharged (for certain commodities), and opportunism. Issues such as psychological problems, domestic violence, fear of becoming unemployed, and difficulty in education were also mostly mentioned by

the female respondents, while the male respondents mostly focused on macro problems with a socioeconomic and sociopolitical scope.

Table 3 summarizes how Turkish people spent their time at home during COVID-19 quarantine days.

<b>Table 3. Indoor Activities Household Individuals Engage in during COVID-19 Quarantine Days</b>	
<b>Indoor Activities</b>	<b>Distribution (%)</b>
Watching TV Regularly	75.8
Watching News Programs on TV	94.7
Watching News Shows	74.9
Watching Films and TV Shows	54.4
Watching Other TV Shows	18.7
Working from Home	27.6
Internet Usage	58.4
Watching Films and TV Shows on the Internet	38.4
Watching News Shows on the Internet	18.7
Social Media Usage	53.3
Shopping on the Internet	11.6
Food	11.1
Buying Cleaning Products	10.9
Buying Technological Products	8.2
Buying Baby Products	7.1
Buying Books and Stationery Products	5.8
Hobbies/Pastime Activities (Drawing, Painting, Knitting, Reciting the Qur'an, Gardening, Walking Indoors/Exercising)	4.4

Table 3 illustrates that 4.4% of the Turkish population almost had no hobbies to spend their spare time with. In terms of age groups and gender, a significant part of the urban population comprising mostly of 70+ males had almost no hobbies to engage in. As for the females, no statistically significant hobbies were found, except for cooking and knitting for the middle and lower-middle class socio-economic groups. Likewise, conventional mass media usage increased with the TV watching rate climbing up to almost 95%, and 74.9% of the population relied on news coverage on TV rather than on social media or online news sources. There was literally a decline on the level of trust regarding COVID-19-related news coverage on social media sites, which was measured as 56.4%. The respondents frequently mentioned the prolonged negative impact triggered by social media posts shared in the aftermath of the first lockdown announcement. The reason for the increased level of trust for news coverage and programs on TV channels was stated as the scientific tone of the

discussions mostly participated by prominent scientists and medical doctors prominent in their fields, rather than personal perspectives and viewpoints to be shared. During the COVID-19 quarantine period, the TV watching rate turned out to vary between 0.5 and 5.0 hours for the general population, while the time spent on the Internet was on an average of 2.5 hours to be mostly spent on social media sites and online news sources in the form of frequent and short intervals. However, unlike the general public, the time spent on the Internet went up to as high as 8 hours for the age group of 44 years and below.

When the time spent at home was exposed to further analyses, individuals in the Turkish society tended to act more instinctively and intuitively rather than to follow systematic behavioral patterns. This tendency must urgently be adjusted and improved through tailor-made education and training sessions designed for specific target groups in the population. For instance, certain talents and skill sets along with games to be played in groups as pastime activities can be taught and improved through tailor-made education and training sessions designed for divergent socio-demographic segments of the society, such as youngsters, seniors, and gender specific.

Additionally, this study revealed that shopping through the Internet turned out to be lower than expected with the narrower range of general products/services, except for health-care products, masks, and medicines. This can be attributed to three main reasons, namely, (i) not being able to determine the necessary products apart from the basic needs due to uncertainty, (ii) tendency to save from expenses related to uncertainty, and (iii) postponement for the future. Overall, all these can be linked to the fact that Turkish people tend to act more impulsively at times of crises.

The already existing health problems of the households were also looked into. Tables 4 exhibits the problems stated by the respondents.



<b>Asthma-Allergy</b>	64,4
<b>Cardiovascular Diseases</b>	38,4
<b>Hypertension</b>	24,3
<b>Spinal and Backbone Conditions</b>	21,4
<b>Depression</b>	30,9
<b>Chronic Cough</b>	22,3
<b>Stomach Conditions</b>	19,5
<b>Diabetes</b>	18,9
<b>Obesity</b>	11,1
<b>Chronic Renal Conditions</b>	10,2
<b>Other Diseases (Including COVID-19)</b>	3,2

Table 4 also affirms that respiratory tract diseases, cardiovascular diseases, high blood pressure, and chronic cough were identified as the most prevalent health conditions in Turkey. These conditions were twice as common among males as opposed to females, and the triggering factors seemed to be intertwined with smoking and insufficient access to fresh air either indoors or outdoors. Moreover, depression and related psychological conditions were mostly expressed by females from the middle-age and below middle-age socio-demographic groups.

### **Conclusion**

The lifetime of the humankind on Earth is a long journey and prone to several epidemics and crises, with COVID-19 as only one of them. The scholars and academics are expected to explore this process by proof-based analytical research studies to come up with solutions for the during- and post-crisis periods. This expectation necessitates focusing on the cause-and-effect relationship of the phenomena to discover the hidden patterns behind them. Sophisticated phenomena and incidents bring forth the need for an analytical perspective to generate more accurate and academically sound findings and conclusions. The present research is an exploratory study with an analytical nature based on a similar need, with which the researcher hopes to generate contributory results and conclusions.

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