

# Analysis of the spread of COVID-19 worldwide: Difference and similarity

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## Research

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## Abstract

**Background:** Today, the world faces a global health challenge caused by COVID-19, but its lethal effect varies from one country to another. Indeed, the COVID-19 does not seem to have the same gravity and lethality wherever transmission focus and chains exist. With COVID-19 epidemic's progression, measures to stem its propagation are more and more drastic and numerous. Some were taken in a hurry, others are the result of feedback. Did the multiple measures taken to fight the coronavirus have to be adapted to the local specific conditions of each country?

In this work, a review of measures taken to stop this pandemic propagation will be first proposed as well as their impacts analysis. It will also provide an overview of COVID-19 levels of vulnerability depending on the disposals and measures taken to fight this virus which differs from one country to another and sometimes overlap. In a second step, we will relate the disparities' reasons of the lethality rate which must be interpreted with precaution, based on the 10,000 people scale's demographic rate considered to be reasonable far from any overbidding or chaotic overestimation.

The scenarios studied keep into account a wide range of standards and measures adopted, such as: health system's condition (medical infrastructure, joblessness allowance, etc.), socio-economic development, epidemics' propagation mode (confinement, age, population density, etc.) and in particular reactivity in measures' taking (borders' closing, a mask taking and wearing obligation, distancing, etc.). The choice of France as a reference to compare the different cases is not harmless since it allows comparisons with countries of the same rank at the economic, demographic, social and geographic level, and also with other countries presenting different socio-economic and demographic situations.

**Result:** The analysis of the various scenarios implemented to combat the spread of the coronavirus and cautious answers' research forces us to ask the following questions: did we need to distribute given statistics between deaths due to coronavirus or death with coronavirus? Then how can we distinguish between the true death due to coronavirus and its accidental presence at the death time? These questions and observations brought out that, the available statistics are relatively incomplete or even inconsistent and don't allow rational explanation.

**Conclusion:** COVID-19 advent and its globalization recommend courage, clarity and humility. In addition to the uncertainty and ambiguity of incomplete or distorted data, their using modality would be at the origin of bad decisions. The design of efficient pandemic scenarios combined with a logical outcome processing structure establishment can mitigate the risk of incomplete data. Today, epidemiological statistics, moreover, informative and indicative can be at coming up crises' better treatment origin. The right strategy and the right decision-making can restore the society liveliness in these troubled times. We can say that it is in the announced results there is lacking, creating a psychosis through fear and dramatization.

## Introduction

With Covid-19 epidemic's advance, numerous measures to stop its propagation have been taken, but they have variable relevance from one country to another [1]. What is the pandemic magnitude? Why does it vary from one country to another? Do the same measures have the same impact on COVID-19? Are these measures efficient? Much questions that we will try to answer by profiling some countries we seemed to be representative. France case has been taken as reference for the comparative study to analyze the inconsistencies in death statistics in countries. To this end, we will develop a more complete picture of how the virus spreads in countries, and reasons behind these differences in propagation, which highlight the disparities and inconsistencies in occurred death statistics in each country.

Each country better remarkable measures' impact understanding allows better orientation, with more accuracy and objectivity, of efforts made in response to the pandemic as it's in progress.

Currently, the United States of America is the most affected by coronavirus with more than two millions cases identified and more than 120,000 deaths recorded [2]. This statistic can scare, compared to the number of deaths in France it is slightly less than the double for the same period. USA population is five times greater than France population. These statistics will have significations if we take into account the number of people. Reduced to the number of deaths per 10,000 people, the lethality rate is 3.6 in France, which is lower, but is much higher than other countries' rate such as Morocco's lethality rate estimated to 0.06.

It is more awesome to announce 25,000 deaths than to say 3 deaths per 10,000 people. Is it a deliberate will to dramatize the situation? The officials also do not present the comparison of numbers of deaths according to different countries while the coronavirus affects everyone in the same way. This is the purpose of this study, which will analyze measures' effects and impact to fight COVID-19. We are going to present:

- Measures impact on the number of deaths and inconsistencies of available statistics;
- Major lessons pulled from this analysis.

## Method

In this part, a review of the measures taken to stop this pandemic spread will first be proposed as well as their impact analysis. we will also provide an overview of the levels of vulnerability to COVID-19 based on the measures taken to combat this virus which differs from country to country and sometimes overlaps.

## Hospital structures' quality

What happened in countries with a poorly developed health sector, medical infrastructure, public health human resources and limited financial resources? At this first reading, we could fear a devastating effect and terrible damage causing. However, the number of deaths per 10,000 people is as followed:

- 3.6 in France,
- 0.06 in Morocco a developing country,
- 0.1 in Greece in an economic crisis,
- 0.06 in Ukraine emerging from a war,
- However in Bangladesh, there are 0.01 deaths per million of people and as its population of 168 million people, more than three times the population of France, and at the same rate, the number of deaths in France would be then 50/10000 people.

The literature review showed that it is Western countries with the best hospital infrastructures in the world, in particular countries belonging to NATO [1], which are the most affected by COVID-19. The opposite can also be seen in poor countries, especially in Africa. So it isn't medical infrastructure differences which could explain the differences in mortality between countries.

## Borders' closures reactivity

Microbes pass over borders and their transmission has been constant over centuries. Since the 1980s, air transport has facilitated contagion to many destinations. So evolution and progress are not in contradiction with the virus transoceanic traveling, but, on the opposite, contribute to its propagation [3]. Thus, closing the borders has become one of the priorities to stem this contagion. However, this reactivity does not seem to be in correlation with the number of deaths reported. In fact, chronologically:

- The United Kingdom, United States and Spain closed their borders first. But they are among the most affected countries with the number of deaths, respectively 58, 32 and 57 per 10,000 people [4][5];
- Portugal has 8 deaths / 10,000 people despite the risk of border contagion with Spain (300 km from Madrid);
- Vietnam with its 300 recorded cases and 0 deaths for 98 million of people. However this country is near the first pandemic focus, China (border at 300 km);
- Same for Cambodia and Laos (no deaths) ;
- In Burma 5 deaths for a population of 55 million of people;
- In Thailand 60 deaths for the same number of people as in France.

Knowing that these Asian countries are very close to China borders which was the epidemic starting point, borders' closing cannot explain this disparity in the number of deaths by country [6][7][8][9].

## The crisis management quality

It would be thought that, more great and populous is a country, more difficult it will be to implement measures to protect its population, sick people detecting and isolating in order to avoid sick people and deaths number increasing. In absolute terms, United States is from far away the most bereaved country in the world with almost 98,000 deaths. If we consider the mortality linked to COVID-19 in relation to the population, United States is surpassed by not less than eight countries with in the first place Belgium with its 82.8 deaths per 100,000 people. It outstripped the United Kingdom (58.7 victims per 100,000 people). Otherwise, the most European bereaved countries by the COVID-19 are, Spain (57.8) and Italy (55.5).

In Nigeria a country with 196 million of people, there are only 233 deaths or 140 times less than in France. India with its 1.4 billion of people recorded only 0.05 deaths per 10,000 people, or 650 times less than in France [2][6][7][8][9]. Same observation for the other highly populated nations included in the list of the most bereaved countries:

- Brazil (29,000 deaths for more than 200 million of people) deplores for example "only" 1.4 deaths due to COVID-19 per 10,000 people,
- Germany ~ 1 (8,500 deaths for 83 million of people),
- Iran 0.96 (7,900 deaths for 82 million of people) and Mexico 0.8 (9,900 deaths for more than 120 million of people),
- About China (around 4,600 deaths), with its 1.4 billion of people, it officially has only 0.03 deaths per 10,000 people.

Even if these statistics allow a more detailed analysis of the epidemic situation in each considering country the measures adopted to protect their population, they must be compared with caution.

## Confinement adoption and respect

In contrary of Europe, where people can live inside houses and have all convenience, African people live outside and only use their homes at night to sleep. Ask to an African to stay at home is ask him to completely change his life way. Everything is done outside and often in a community way, Africans prefer proximity, a real precariousness protection. They don't have any social assistance to live, what can push them to confinement non respect.

- Ivory Coast, Ethiopia and Democratic Republic of Congo have respectively 30, 6 and 68 deaths [6] with a curfew but without confinement;
- In Brazil, the President is opposed to confinement because it is very little followed;
- In Sweden there is no confinement and there are only half of the cases in number of deaths in France;
- In Hong Kong, with the highest population density in the world, there was no social distancing or confinement until late (720 deaths February 2020).

Several governments have not imposed confinement solution, or have done it partially, while recording a low number of deaths. So confinement isn't a decisive factor in the number of deaths huge disparity between countries explanation.

# Can age and climate explain the difference in the number of deaths?

Since the virus seems to apparently more affect older people: do countries with young people have fewer deaths than aging countries? Do countries with warm climate have fewer deaths than countries with cold climate? So does temperature have any influence on the pandemic propagation?

A novel exceptional study in Europe reports that men, elderly and poorest people are at risk populations [10]. Launched on May 7, the first results of the Opensafely project are based on medical data from 17 million people living in the United Kingdom.

However, Japan, which has the oldest population in the world, has 160 times fewer deaths than in France. Greece and Portugal also have an aging population and the number of deaths from coronavirus remains very low. Therefore, the difference in ages of populations cannot explain the high number of losses.

We could think that Africa's warm climate would be too high for COVID-19 and that its young population would be more resistant to the pandemic. None of these arguments is sufficient or solid. Indeed, the number of cases in Florida (arid zone) suggests that COVID-19 can also spread where the climate is hot; and that being young in Africa does not mean being healthy [11] [12].

## Countries are not at the same epidemic level

Announced statistics may suggest that the lower number of deaths in some countries is due to the epidemic late arrival. However, statistics observation showing the new cases number evolution of COVID-19 [7][8][9], it can be observed that for belatedly countries hardly affected, the new cases' number decreases [7][8][9]. This is also the case of countries firstly affected, such as China, Sweden, New Zealand, Iran and France, which are seeing the number of new cases in free falling.

It's not because a country is later affected that the number of deaths is lower, because the worldwide number of cases is clearly decreasing.

## Result

It could be clearly seen that the number of deaths in large populations countries varies between 0 deaths (Ethiopia, Vietnam > 90 million people) to more than 98,000 deaths in the USA, representing a huge difference. Through observations made on measures previously discussed and analyzed; we could say that statistics presentation procedure is alarming and meaningless or incoherent. These statistics don't allow any objective explanation, whereas observing the number of deaths variation by referring to population size, the variation between countries is more significant and can be perfectly explained.

What supposed that the announced number of deaths must be taken with caution and there is an inappropriate consideration of these data to inform the public either by lack of competence or unintentionally according to several specialists.

In fact, no distinction is made between death from coronavirus and death with coronavirus. A person tested positive for coronavirus and who subsequently dies will be automatically declared dead because of COVID-19, as long as coronavirus is considered to prevail over all other pathologies. Such a conclusion is completely absurd as coronavirus is known to affect only the respiratory paths. This is how declarations' number of deaths is "inflated" in contradiction with the basic infectiology principle which specifies that: "it is only when we are sure that an agent has played an important role in illness or death that it can be declared as a cause of death". How can we make distinction between the true death due to coronavirus and the virus accidental presence at the death time?

If in Germany, there were 5 times less deaths than in France, it is not only due to their hospital system, but it is because deaths were counted more rigorously than in France. In USA, health officials are inducing doctors to register COVID-19 as the cause of death for each patient who has been tested positive.

## Discussion

These results and these observations suggest that this crisis is not more serious than a seasonal gripe and from this point of view (rate bases on population), this crisis did not make more victims than previously health crises. Moreover, actually the epidemic evolution is following a bell form development with a rise, a peak and a fall (Gauss curve) and we are clearly in the descending phase for most countries. All the graphs show that the pandemic is in the process of dying out and that there will be no rebound [7][8][9]. In the end, it isn't COVID-19 which was worrying, it is the epidemic reaction which was it, media reactions, government reactions and the population pro reaction. There has been a collective hysteria based on fear according to Dr. Didier Raoult declarations "health crises are more dangerous by the fear they induce than by reality" [13]. So we have to get out of this psychosis because the epidemic is ending and statistics prove it. Economy will take several months to recover, it will take several years to absorb this crisis. Predictions for the post-crisis period are only scenarios in many others, and the current chaos can only be resolved through better communication, information transfer and research results.

## Conclusion

COVID-19 advent and its globalization recommend courage, clarity and humility. In addition to the uncertainty and ambiguity of incomplete or distorted data, their using modality would be at the origin of bad decisions. The design of efficient pandemic scenarios combined with a logical outcome processing structure establishment can mitigate the risk of incomplete data. Today, epidemiological statistics, moreover, informative and indicative can be at coming up crises' better treatment origin. The right strategy and the right decision-making can restore the society liveliness in these troubled times. In conclusion, we can say that it is in the announced results there is lacking, creating a psychosis through fear and dramatization.

## Declarations

Availability of data and materials

The data was not deposited in public repositories.

## Ethics approval and consent to participate

Not applicable.

### Consent for publication

Not applicable.

### Competing interests

The authors declare that they have no

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## Authors' contributions

AE, TRJ and KK designed the analysis, AE, TRJ and OC wrote the first draft of the manuscript in French and then in English. DM provided critical comments on the first version of the manuscript.

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## Abbreviations

Not applicable.

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