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The role of culture on 2020 SARS-CoV-2 Country deaths: a pandemic management based on cultural dimensions

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Abstract This study aims to analyze the role of cross-cultural country differences during a global pandemic. Based on country cultural dimensions and country economic indicators, the research proposes specific policies that might prove of value in order to manage and better respond to present and future critical events such as the 2020 *SARS*-CoV-2 outbreak. The methodology is based on multivariate analysis for the first set of countries and cross-country comparative analysis for the second set of countries. Research results reveal the critical role of the cultural dimensions individualism, power distance, masculinity, long-term orientation and indulgence, along with the country economic context in the magnitude of the consequences of a global pandemic within a country specific context. Based on these results, the study proposes policies adjusted to the countries specific cultural and economic frameworks in order to promote the most effective and efficient management of a critical event such as a global pandemic.

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Introduction

It has become critical to determine and analyze the factors that might have an impact in the spread of a global pandemic. Identifying these factors will allow for the development of policies calibrated to each specific country context. The application of policies adjusted to the country specific context might have a direct impact on the number of lives saved. Furthermore, the optimal implementation of each country context specific containment measures might help determine the success of the social and economic recovery of the country. Along diverse geographical and thematic contexts, Sars-CoV-2 has been well addressed in the recent literature. As illustration, we can refer to Hoffmann and Barbosa (2020), Springer (2020), Brice (2020), Chen et al. (2020), James et al. (2020), Brydges and Hanlon (2020), Cinnamon (2020), Tedeschi (2020), Manzo and Minello (2020), Brunsdon (2020), Tyner and Rice (2020), Maalsen et al. (2020).

Among the many country specific contexts (economic, social, political, etc.), this research focuses on how culture can impact and shape the response to

present and future pandemics, and what policies will have a greater positive impact on the management of such potential events, based on the underlying culture of each country.

Several cultural dimension models can be used as framework to explore the effect of culture on health-related research. Among the most relevant we can find Hofstede's (1991) six cultural dimensions model, Trompenaars seven dimensions model reviewed by Hofstede (1996), Lewis cultural model (2003) whose goal was to better reflect Asian mindset and The Globe Project studies Javidan et al. (2006), that focuses on managers across over 150 countries and their cultural practices and leadership attributes. The present research follows Hofstede's (1991) model based on the extensive support in the literature review for cross-cultural analysis studies.

Hofstede's (1991) framework has supported research in areas such as international business (Soares et al. 2007; Kang and Mastin 2008; Chudzikowsk et al. 2011), as well as ethics, Vitell et al. (1993), economic dynamics, Tang and Koveos (2008) and social responsibility, Kim and Kim (2010). What makes Hofstede's (1991) the proposed framework for the present research is its prevalence in previous studies related to Cross-national differences in disease rates such as Matsumoto and Fletcher (1996), infectious diseases and culture, Murray and Schaller (2010) and country culture and the implementation of infection control in European nations, Borg et al. (2012). Furthermore, the present research reviewed other studies that adopted Hofstede's framework such as Fincher et al. (2008) who reported the relation between pathogen prevalence and cross-cultural variability and Uskul (2010) who addressed in his study the cultural aspects of health and illness. Finally, Betsch et al. (2017) following Hofstede's model, expose the potential effect of culture on the effectiveness of vaccination policies, which is a critical element on the future strategy to control the 2020 SARS-CoV-2 outbreak.

The main purpose of this paper consists in identifying potential relations between country cultural differences and death ratios. Furthermore, the second contribution of the research focuses on developing policies that can be adjusted to specific country cultural contexts in order to control the pandemic and reduce its negative social and economic effects. We selected two sets of countries to test the research hypothesis. The first set is composed of countries that comply with two criteria: having the highest number of cases and having perform at least 2000 test per one million residents. 46 countries meet these requirements based on the World Health Organization (WHO) Coronavirus disease situation report as of June 1st 2020. The second set of countries selected for the study correspond to Scandinavian countries versus European Mediterranean countries.

There exist three potential country scenarios when reacting to a global pandemic. The first one is denial. As Mackinnon states, Turkmenistan has reported zero cases of Coronavirus as of May (2020), even though the country closed its borders in April 2020. The second scenario is underreacting, which might cause the third scenario, overreacting, due to the need to impose abrupt and expeditive measures later on. How society will react, adjust and adhere to these measures might depend on cultural factors that we will analyze along the following research. As Hoffman (2020) indicates on global pandemics, "It really is important that the response continues to be motivated by the best research evidence" (p. 2). The researches should include all possible factors that might have an impact optimizing the response to a global pandemic.

The subsequent sections of this study are as follows: the second section reviews the literature that addresses the key relevant studies on culture and its impact on country's decision-making during critical periods. This section also provides the conceptual framework and hypotheses. The third section outlines the methodology adopted to address this study followed by results. The fourth section focuses on the discussion and policy implications of the findings. Finally, the last section concludes the study along with limitations and summarizes policy recommendations.

Literature review

The current research proposes that country cultural conditions might have an effect on the way governments react, establish and implement policies to control global pandemics. Furthermore, country culture might also affect the degree of acceptance and compliance of precautionary and control measures by its citizens.

Culture represents an elusive concept. It is the center of several research areas, and depending on the

discipline, different frameworks are established. The general consensus defines culture as the result of environmental factors for a group of people who share a specific territory. This territory does not have to purposely fit with country boundaries. Among the most cited authors in the literature related to the concept of culture, we can find the culture definitions of Hofstede (1991) and Fisher (2009); Hofstede and Minkov (2010), McSweeney (2013) and Triandis (2018). These authors share the underlying concept of culture emerging from an environmental context. Heine (2008) emphasizes the role of life-shared experiences on the development of culture, while Matsumoto (2009) sets at the center of culture the search for finding meaning in life. On a different approach, Keith (2011) relates the culture development of a society with the need for survival, particularly important for the present research.

While the approaches to the definition of culture might take different paths based on the discipline where it is related, there exists an underlying trend that focuses on the survival of the individuals within the group, as well as the survival of the group itself. The well-being of the society who shares a common culture will depend upon the individuals adhering to the learnt familiar and collectively accepted behaviors.

For the purpose of this research, the definition of culture relates to Hofstede's research where the author defines it as the programming of the individual minds within one group in order to differentiate from other groups. Culture is a collective shared reality derived from each group environment and generates a collective experience (1980). We should keep in mind that culture is not ascribed to political boundaries, since variables such as geography, history and climate might better define a collective society, rather than national boundaries.

The present research focuses on cross-country comparative analysis, where we analyze a group of countries based on a theoretical framework and the effect of the 2020 SARS-CoV-2 pandemic.

Working on comparative cultural country research implies consulting different theoretical proposals, such as Pusaksrikit and Kang (2016) who studied the relationship between ethnicity and behavior. Harrison et al. (2017)studied the implications of a multicultural identity, while Hossain (2018) focused on the relation between cognitive style and the thinking process within cultures. Chen (2018) studied how culture shapes norms, and Lalwani and Wang (2019) research concluded that cultural backgrounds and values could shape the decision-making process of individuals and a society as a whole.

The review of the recent literature establishes two consequences. Despite the fact that there exists an abundant research on the topic of culture and its impact on social, economic and political aspects, this intercultural trend continues to expand and influence every country, community and individual. Therefore, the need for understanding these processes fosters present and future research in these specific areas. The second consequence of these trends relies on the fact that, while previous studies tend to center around Western countries, the most dominant global economic and political forces continue shifting towards Asia. This implies that we might have to devote more resources trying to better understand cultures to which we might have being less exposed to.

For the present research the authors performed an advanced Google Scholar search by article titles in order to assess the most common cultural frameworks applied in previous studies. Based on the total number of articles published as of June 2020, the most cited theories on cultural models are the following: almost 14% of the articles propose Hofstede's model as the main theoretical background. 8.5% of the articles rely on indigenous factors such as belief, religion, myths and ideology. Ethnicity represents 7% of all theoretical backgrounds, while self-construal theories, language and diversity are also above 5%. Identity and localization account for 4.5% and 3.3% of the total research articles, while Halls cultural dimensions represent the main theoretical framework in 1.6% of the research articles. Based on the analysis of these figures, Hofstede's cultural dimensions (2001), along with Hofstede and Minkov (2010), represent the model for the cultural dimensions outlined for the present research. This will allow for broader research analysis and contrast of the results for the present studies.

A global pandemic represents one of the major challenges a society could face. According to Wong et al. (2006) and Heppner (2008), culture might help understand the different strategies adopted by social groups in order to cope with unexpected events. As an example, Markus and Kitayama (1991) established in their research that citizens belonging to cultures with a

high degree of individualism, might feel more inclined to develop a self-construal approach and behave in a more independent, rather than interdependent, style. Higgins et al. (2008) and Kurman and Hui (2011) confirm the fact that individuals, (Fig. 1) under stressful scenarios, will turn into their default cultural values in order to better cope with unexpected events.

Using as a reference Hofstede's (1980) cultural dimensions, Cho and Lee (2015) examined self-protection behavior during the 2009 H1N1 flu pandemic. The disease started in January 2009 and lasted for 19 months, affecting especially Mexico, the United States, China, South Korea and Brazil. The findings reveal that, while factors such as risk perception and personal believes had a deep influence in individual behavior, cultural dimensions such as Individualism vs. collectivism also moderated the personal behavior across different geographical areas.

The SARS virus outbreak started in 2002 and lasted for 2 years, affecting specially China and Canada. Ji et al. (2004) reported on how the degree of pessimism of a society could affect the dissemination of a pandemic, due to underestimating or overestimating the possibilities of being infected. More recently, Travica (2020) investigated the different country confinement responses to the 2020 SARS-COV-2 pandemic. The findings report that the adoption strategy of the three potential scenarios: restrictive, permissive and hybrid confinement, is influenced by cultural assumptions.

Hofstede's (2011) addresses and defines six cultural dimensions within his model. We address within this research the potential role of the following Hofstede's variables on the number of deaths per country during a global pandemic.

Individualism vs collectivism (IND): how individuals feel integrated within their groups (Hofstede 2011). In an individualistic society, citizens might feel freer to choose. This might have an impact on the individual decision whether to adhere to the new norms, and more incline to reject measures to control the pandemic such as tracking strategies because they affect the individual right to choose. In a collectivistic society, individual behavior that can harm the group will not be tolerated as individuals will feel the pressure to comply and behave according to the norms

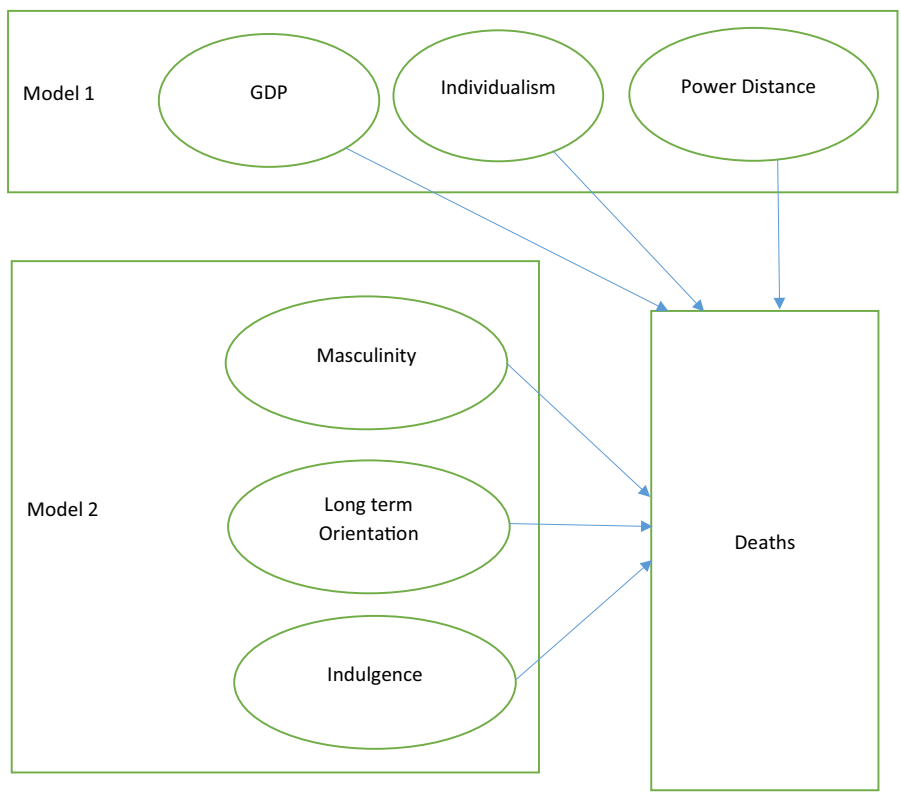

Fig. 1 Variables used in three models

that better serve the group interest such as following social distancing. This would imply that individualistic societies would be at a higher risk to confront a global pandemic.

Power Distance (PD): how power is perceived and distributed within family, institutions and the society (Hofstede 2011). During times of crisis, such as a global pandemic, low power distance countries might rely on their social compromise to comply with the new norms and regulations, while high power distance countries might have to use harder control measures, penalties and even the use of force, which might cause social unrest. This would reduce the effectiveness of the control measures, and increase the number of deaths in high power distance countries.

Masculinity vs. Femininity (MAS): A masculine society is based on competition, and might rely on aggressive methods and behaviors in order to solve conflicts (Hofstede 2011). Measures that might not prove effective, but send a message that the fight is taking place in all fronts could be applied. Masculine societies might see a pandemic as a war that must be fought and won at all costs. Feminine societies rely on consensus in order to solve conflict. Consensus allows for discussions about the necessary measures to adopt during a crisis. This consensus might increase the degree of acceptance of difficult new norms by the population. The main drivers of a feminine society are aligned with taking care of others and increase the quality of life. This approach might allow feminine societies to better cope with a global pandemic, and could lead to a lower number of deaths in the country.

Uncertainty Avoidance (UA): UA relates to how a society faces stress under new or unknowing situations. According to Hofstede within uncertainty avoidance societies, cleaning rituals, as well as keeping physical distancing might be more culturally integrated (2020). These rituals could help better control a pandemic and reduce the country death ratios.

Long Term Orientation (LTO): defines the relation each culture experiences with its past, present and future (Hofstede 2011). Although countries with a high LTO might plan ahead of recurring crisis such as cyclical economic periods, a global pandemic represents a disruptive event for which very few nations might be ready to face. In this case, according to Hofstede (2020), countries with a low score in this dimension are more prone to embrace hypervigilance and avoidance measures. Both strategies might result helpful in the short run in order to flatten the infection curve faster during a global pandemic. Due to these strategies, countries with a low LTO index might be able to decrease the number of deaths during a global pandemic better than countries with a high LTO.

Indulgence versus Restrain (INl): Restrain cultures tend to present a stronger control over impulses (Hofstede 2011). A society with a high indulgence index (weaker control over impulses), might have more difficulties accepting the hardships and consequences imposed by a global pandemic, while a society with a high restrain index might view these consequences such as social distancing as a normal part of the healing process. Restrained societies might be more at ease with the fact that life can be bitter in general and accept disruptions such as social distancing as another necessary life struggle.

The first four cultural dimensions (IND, PD, MAS, UA), correspond to the original ones developed by Hofstede (1980). The fifth-cultural dimension (LTO) was later included into Hofstede's model in order to address the critics of ethnocentricity on the development process of the original cultural dimensions. Long Term Orientation tries to address specific cultural dimensions of the Asian continent. In 2011, Minkov contributed to the final model with an additional cultural dimension (Indulgence vs. Restrain) also in order to reduce potential ethnocentric biases of the original proposal, and to further complete the model.

Despite the fact that Hofstede's model is the most widely used when developing research on cross-cultural issues, there are several critics to the model. McSweeney (2002) points at flaws in the methodology used by Hofstede, as well as the excessive weigh that the model imposes on determinism and national culture. Hofstede made changes and replied to these critics in the second edition of its 1980 book. Ailon (2008) proposes a critical review of Hofstede's cultural dimensions both in terms the theory and its methodology. Hofstede's argued that the proposed cultural dimensions could be used in an aggregated way, but not in an individual scale. The fact that a person belongs to a specific country or region does not imply that the cultural dimensions define the individual. Tausch (2017) performed a reanalysis of national data from the World Values Survey and crossed the results with Hofstede's (1980) model value results. Tausch (2017) was able to confirm the results of

Hofstede's model, especially for the dimensions of Power Distance, Individualism, Long-term orientation and Indulgence. Hofstede's framework provides a rational, well-tested approach, as well as a model that has evolved in order to adapt to the global changes.

The research includes an additional variable, projected GDP per Capita for 2020, in order to evaluate the economic dimension within the world pandemic context. GDP per capita represents a performance indicator that can provide value when comparing average standards of living across countries, as well as a proxy to their wellbeing. Nevertheless, GDP per capita does not reflect the income distribution within a country. One of the singularities of the 2020 SARS-CoV-2 is the fact that high-income countries have reported larger death tolls than middle-low income countries. Williams et al. (2000) provide two potential reasons for this statistic: countries with high-income might count with more internationalized companies, as well as with citizens with greater resources to travel. These two factors might have been critical to spread the virus during the early stages of the global pandemic. According to The World Health Organization (2020), elder population are at higher risk of dying from 2020 SARS-CoV-2. Countries with higher income have a larger population in their pyramid of peoples over 50 years old. The virus starts increasing its death rate around this threshold. In order to account for these factors, we include the variable GDP per capita within the study in order to understand its potential interactions. The data was collected from the International Monetary Fund World Economic Outlook (I.M.F. 2020).

The two major research questions (RQs) that we addressed through this study are:

RQ1. What is the potential effect of country cultural dimensions on the control of global pandemic?

RQ2. How cultural differences might affect the country response to a global pandemic within Mediterranean European countries and Scandinavian countries?

These research questions are based on Hofstede's (2020) questioning and exploration on how cultural dimensions might shape different responses and effects of coronavirus management among different countries.

Based on the review and analysis of the literature and the research questions, the present research proposes the following hypothesis:

H1 Countries with high economic growth, high Individualistic index, and high-Power Distance index will experiment higher dead ratio among nations during a global pandemic.

H2 Countries with high Masculinity index, Long Term Orientation and high indulgence index will experiment higher dead ration among nations during a global pandemic.

H3 Countries with high Masculinity index, high Individualistic index, high Power Distance index and high Indulgence index will experiment higher dead ration among nations during a global pandemic.

H4 Based on their cultural country context and GDP per capita, Mediterranean European nations will experiment higher dead ratios than Scandinavian nations during a global pandemic.

While the first three hypothesis relate to a global world context, the fourth hypothesis revolves around a more specific area of the world and the different way the 2020 SARS-CoV-2 has affected the North and South of Europe. Three Scandinavian countries (Sweden, Norway and Finland) will be analyzed along with three Mediterranean European countries (France, Spain and Italy), in order to understand the potential relation between their cultural dimensions and the spread of the 2020 SARS-CoV-2. The reason behind the proposed fourth hypothesis resides on the fact that, while the literature review expose high income countries might experience higher death percentages, this might not be the case within European countries, which calls for further assessment.

Methodology

What makes this 2020 SARS-CoV-2 virus different from previous outbreaks such as SARS (2002 outbreak) and MERS (2012 outbreak), is the speed at which 2020 SARS-CoV-2 has spread to almost every country in the world as of June 2020. Figure 2, 3 in result section graphically illustrates this information. The data is sourced from the World Bank.

To address the research questions, we collected the secondary data from the World Health Organization (WHO), the International Monetary Fund (IMF) and the World Bank. For cultural dimension indexes such as Power Distance (PDI), Individualism (ID), Masculinity (MS), Uncertainty Avoidance (AV), Long-term Orientation (LO), and Indulgence (IG), we

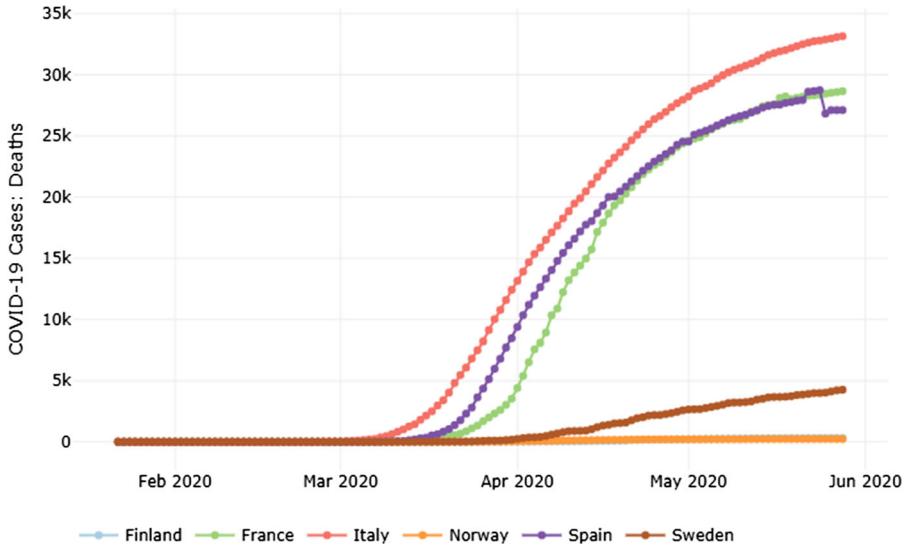

Fig. 2 No. of 2020 SARS-CoV-2 deaths in Mediterranean European countries and Scandinavian countries from January to May 2020 *Source*: World Bank 2020 SARS-CoV-2 data source

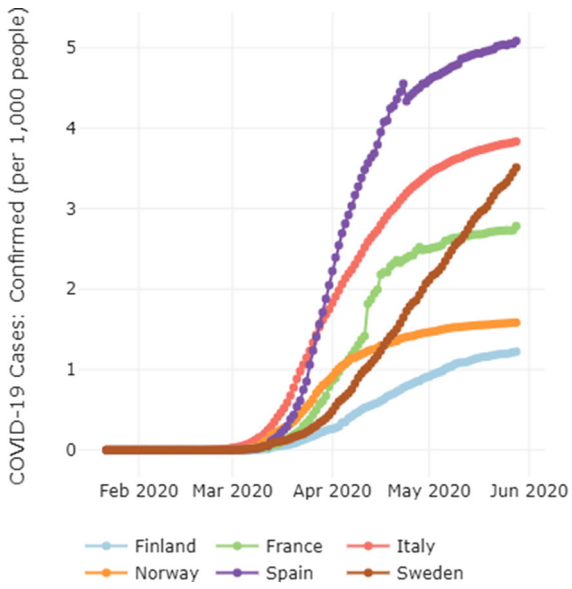

Fig. 3 2020 SARS-CoV-2 deaths per 1.000 people from January to May 2020 *Source*: World Bank 2020 SARS-CoV-2 data source

received the data from Hofstede's cultural dataset available at data.world.[1] Since GDP data is available on annual basis, it was challenging to bring in the economic data of 2020. Therefore, an estimated economic data (GDP per capita) for 2020 was fetched through IMF, which is used in the current study. Additionally, several agencies are instrumental in reporting the 2020 SARS-CoV-2 deaths. We used the information from Corona tracker[2] and the World Health Organization (WHO) Coronavirus disease situation report to access the officially reported country death ratios per million country residents as of June 1st 2020.

Two research questions are addressed through two approaches. For addressing question 1, we conducted empirical analysis through robust regression method. Robust method is considered the applicable tool especially when data has a high presence of outliers and variance. Our second question is focused on the cross-culture death related aspects within European countries. Therefore, to address the question we relied upon descriptive comparison of averages of cross culture parameters and reported deaths for Scandinavian and Mediterranean countries.

Additionally, the aim is to understand the effect of cultural and economic variables on the 2020 SARS-CoV-2 death ratios, the dependent variable considered in the study was 2020 SARS-CoV-2 death per country under study until the last day of May 2020. The other explanatory variables used in the study were estimated GDP per capita, PDI, ID, MS, AV, LTO and IG. We

[1] https://data.world/adamhelsinger/geerthofstedeculturaldimension.

[2] https://www.coronatracker.com/.

have conducted the correlation testing and there was no correlation detected in the variables. Table 1 indicates the correlation matrix.

We tested the data for the unit roots, and variables were found free of unit roots. The cross-cultural (Hofstede's indexes) and economic variable (GDP) are likely to impact the deaths with varying statistical explanations. To avoid the complexity of modelling too many variables through single model, we looked into the data through three robust regression models. The three models (Fig. 1) were chosen based on the econometric data rules. The variables used in the models were free from serial correlations. Additionally, the three proposed models offered the three different perspectives which enhanced the depth of analysis presented in the study. The dependent variable "reported deaths" remained same for all the three models. In model one, we used the GDP, Individualism and Power distance as independent variables. It was assumed that the mentioned variables are critical to explain the reported deaths. Whereas, in model 2, Masculinity, Long term Orientation and Indulgence were assessed to play a significant role in the "reported deaths".

Figure 1 illustrates the variables used in the three models under study.

We have used the Huber white to account for the heteroscedasticity followed by Sisodia et al. (2016) The following models were considered for the current study.

$$\text{Log(deaths)} = \beta 0 + \beta 1 * \log(\text{GDP}) + \beta 2 * \text{PDI} + \beta 3 * \text{ID} + \varepsilon \quad (1)$$

$$\text{Log(deaths)} = \beta 0 + \beta 1 * \text{MS} + \beta 2 * \text{LO} + \beta 3 * \text{IG} + \varepsilon \quad (2)$$

whereas, deaths represent 2020 SARS-CoV-2 country deaths as of June 1st 2020, β represents coefficients of independent variables, and ε is the error term.

We assumed that all the five cultural dimensions might affect the deaths on different parameters; therefore, we decided to test three different models. We relied on beta values, error terms and P-values for the analysis of our model results. Nevertheless, in the social science data with respect to Hofstede's dimensions, R-squared is not a critical factor to explain a model fit. Therefore, we eliminated the implication of R-squared and adjusted R-squared in our results. For low R-squared values in social sciences, please refer to Neter et al. (1996) Freund and Littell (2000) We used Robust least square method to compute the results.

Results

Figures 1, 2 present the 2020 SARS-CoV-2 deaths for six European countries.

The figures illustrate significant country differences in the death ratio, within the same continent.

Table 1 Pearson Correlation Matrix

	Total Deaths	Power Distance Index	Individualism	Masculinity	Uncertainty Avoidance	Long-term Orientation	Indulgence	GDP
Total deaths	1							
Power Distance Index	− 0.17	1.00						
Individualism	0.47	− 0.67	1.00					
Masculinity	0.10	− 0.05	0.03	1.00				
Uncertainty Avoidance	− 0.07	0.31	− 0.24	− 0.02	1.00			
Long-term Orientation	− 0.08	0.11	0.04	− 0.05	0.09	1.00		
Indulgence	0.16	− 0.49	0.42	0.09	− 0.26	− 0.33	1.00	
GDP	0.25	− 0.56	0.61	0.06	− 0.31	0.22	0.45	1

The results of three robust regression models (explained in the methodology section) are presented in Table 2.

It was noticed that the variables GDP per capita and Death ratio represented large number when compared to the numerical values represented Hofstede's dimensions. Therefore, to reduce the effect of numerical values, we used logarithmic values of GDP and Deaths in the model.

Three models with different sets of independent variables were defined. In Model 1, PDI, ID and GDP were considered. It was noted that PDI and ID were positively and highly significant at 1% level. 1 change in the PDI and ID can lead to 0.038% and 0.058% change in deaths, respectively. Whereas, the GDP was noted positive and significant with a coefficient of 0.25 at 10% level. For model two, we studied the effect of MS, LO and IG on the deaths. All the three variables were found to be significant at 1% level with the coefficient of 0.049, 0.048 and 0.05 respectively.

Further, from the news and death case analysis, it was noticed that Scandinavian countries reported fewer percentage of deaths vs southern European countries, particularly, Mediterranean ones. It was hypnotized that the difference in the number of deaths might be due to the cross-cultural dimensions. In "Literature review " section, we created two groups of countries. Group 1 included the Southern Mediterranean European countries France, Italy and Spain. Group 2 clubbed the Scandinavian countries Norway, Sweden and Finland. We related the cross-cultural dimensions based on death ratios and GDPs per capita of above-mentioned countries. We computed the averages of Hofstede's cultural dimensions for two groups, and a clear distinction in cultural behavior is noted in Fig. 4

Table 2 Models' results

DV- log (Deaths)	Model 1 (M1)	Model 2 (M2)
PDI	0.038923*	
ID	0.058461*	
MS		0.049255*
MS X ID		
LO		0.048549*
IG		0.05472*
PDI X IG		
log(GDP)	0.254181**	
R-Square	0.12	0.72

*Represents *P* values significant at 1% level

**Represents *P* values significant at 10% level

Except for individualism, there is a clear distinction on all cultural dimensions between Scandinavian countries and Mediterranean European countries. The average index on Masculinity records a significant 39 scale point's difference. Scandinavian countries have a very low masculinity index, which could account for the lower rate of deaths due to the traits associated to this low score, such as the search for consensus in decision making, with a greater acceptance of the norms and higher compliance derived from it.

Figures 5, 6, 7, 8, 9, 10 represent the descriptive results addressing second research question on various cultural dimensions.

Despite the higher GDP per capita of Scandinavian countries, the death ratio is lower than in European Mediterranean countries (contrary to what occurs when analyzing European and non-European countries). This might be due to other factors outside the scope of this research, such as the quality of the country health systems or different states of country readiness. Furthermore, for these two subsets of countries, PD works in the same direction than the global country analysis, since the lower the distance to power, the lower the number of deaths.

All the countries except Spain show an individualistic index over 60. Therefore, no specific assumptions can be inferred for this group of countries.

According to Hofstede countries with a low uncertainty avoidance index could face a risk of carelessness (2020). This could lead to implementing less restrictive measures, as was the case of Sweden, within the Scandinavian countries. Sweden was the country within the Scandinavian ones with the highest death ratio. This fact obliged the country later on to implement stronger control measures than its neighbors, as de virus progressed. On the other hand, a high uncertainty avoidance index has not allowed Mediterranean European countries to achieve a lower death ratio than the Scandinavian countries, at least, during the first six months of the pandemic. This fact might revert as the consequences of the pandemic become more obvious in the countries with a higher death rate and a high uncertainty avoidance index.

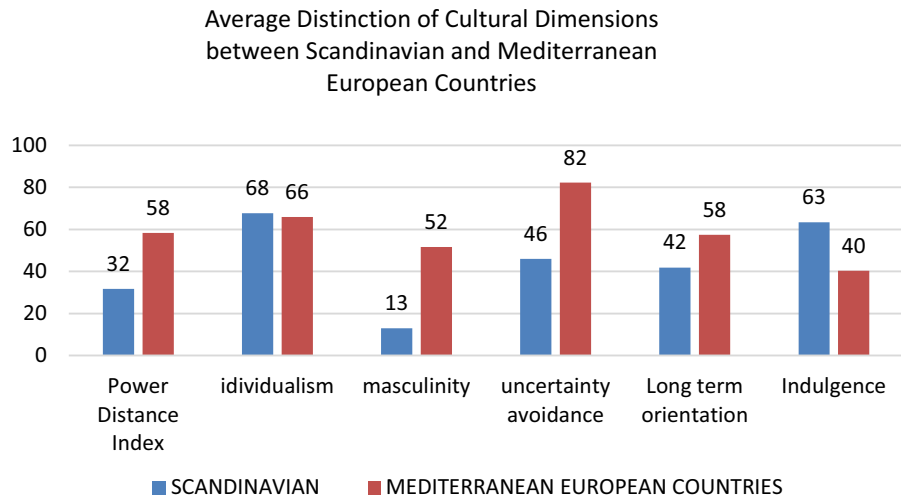

Fig. 4 Average distinction of cultural dimensions for two sets of countries

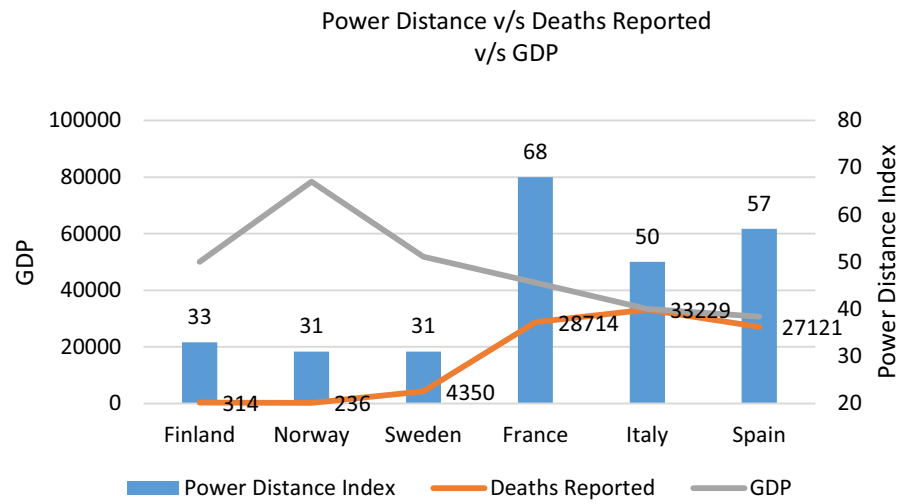

Fig. 5 Powers distance relation to death ratios reported and GDP per capita

The three Scandinavian countries score below 30 on masculinity index, while having clearly lower death ratios than Mediterranean European countries. The decision-making process based on consensus for the former countries, might allow for the broader acceptance and implementation of the control measures, lowering their death ratio.

European Mediterranean countries report higher LTO indexes as well as higher death rates than Scandinavian countries, which is consistent with the proposed hypothesis. Despite the fact that LTO might imply that a country would be better prepared for future crisis, the two countries with the lowest LTO index (Finland and Norway) do also have the lowest death ratios. A possible explanation might rely on the fact that LTO produces positive results when planning allows preparation for recurrent crisis, such as economic cycles or seasonal natural disasters, but LTO might not provide a competitive advantage when related to disruptive events.

Mediterranean European countries report a lower indulgence index than Scandinavian ones. According to Hofstede (2020), this should allow the former countries to report a lower ratio of deaths, but this is not the case, since Scandinavian countries have an above 50 indulgence index, and still show the lowest death rate. This might be due to the positive effect of other cultural dimensions on Scandinavian countries, as well as country specific endowments.

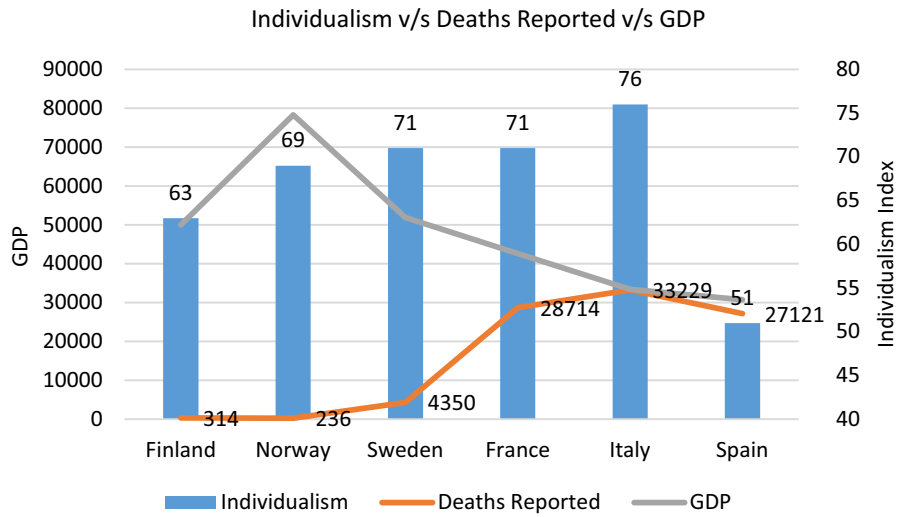

Fig. 6 Individualism relation to deaths reported and GDP

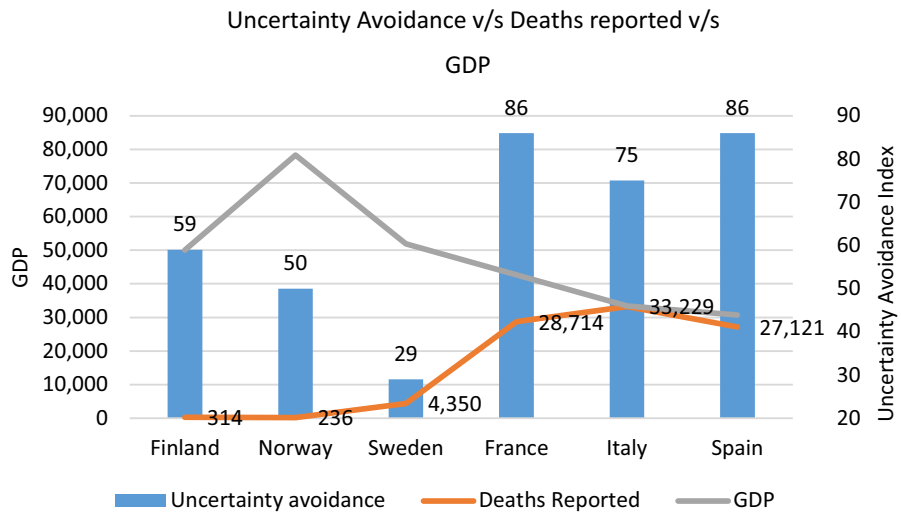

Fig. 7 Uncertainty Avoidance relation to deaths reported and GDP

Discussion and policy implications

Discussion

Based on the first model results, countries with a high GDP per capita will experience higher death tolls within a global pandemic, confirming Hypothesis 1. These results are in accordance with Williams et al. (2000) research. A country with high GDP per capita might suggest a more internationalized national economy, which implies a higher degree of global interconnection, fostering the flow of individuals (sending and receiving national and foreign travelers) from headquarters to production facilities and vice versa. These production facilities usually are located in lower income countries. Furthermore, citizens from high GDP per capita countries will be more prone to traveling than citizens from low GDP per capita for leisure reasons, contributing to the accumulation effect of virus spread inside the country and, on a second phase, extending the virus to other regions.

Hypothesis 1 further states that high individualistic country indexes, will also contribute to extend the virus in the early stages, since citizens rely on their own decision process in order to accept measures that help control the pandemic and might be less inclined to adopt measures that restrict their individual freedom. The present results confirm this hypothesis which is aligned with Hofstede's premise (2020). Aligned with hypothesis 1 and the results for the

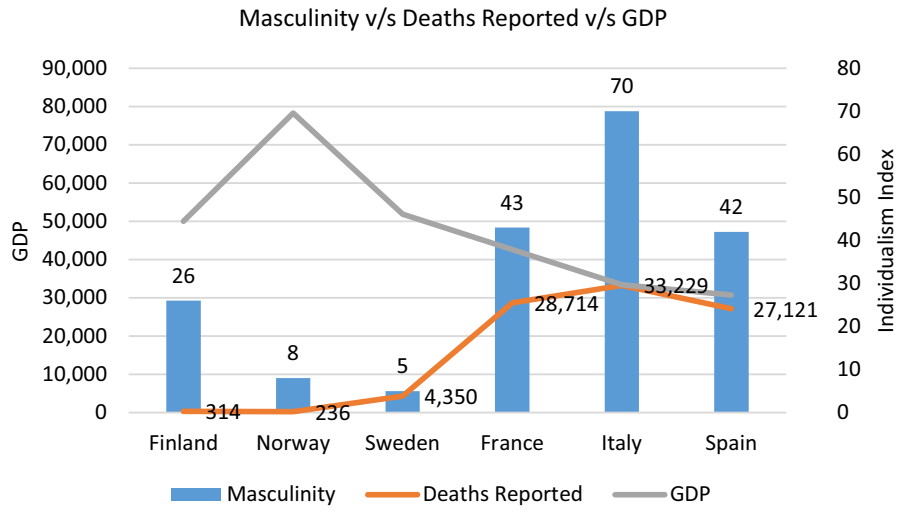

Fig. 8 Masculinity relation to deaths reported and GDP

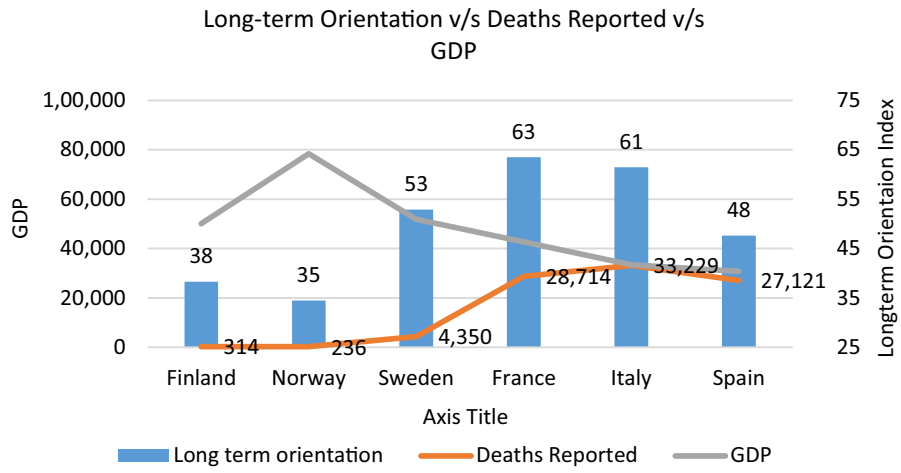

Fig. 9 Long term Orientation relation to deaths reported and GDP

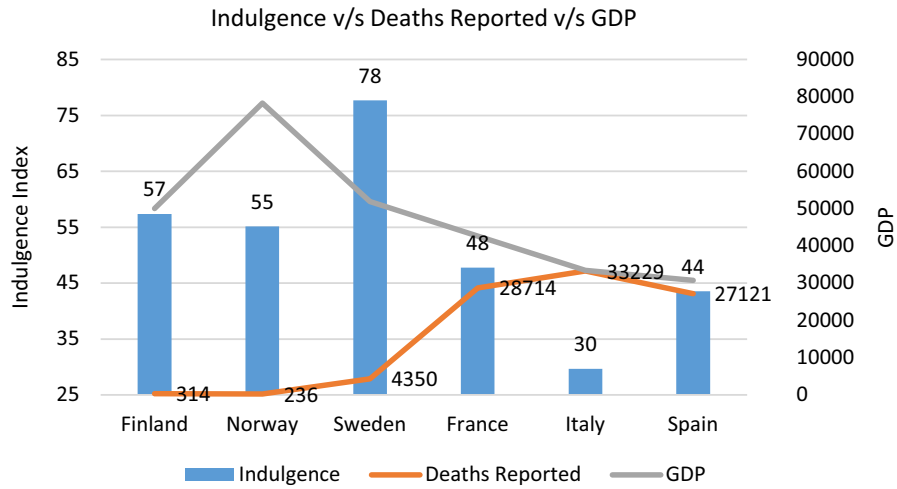

Fig. 10 Indulgence relation to deaths reported and GDP

present research, Hofstede (2020) also proposes that countries with high-power distance index will further contribute to the expanse of the virus. This might be due to the fact that in high power distance countries, governments will have a stronger tendency to use force in order to implement control measures, which might also lead to social unrest. Low power distance countries will be able to rely on the concept of mutual obligation as part of their social contract. This will allow low power distance countries to comply with the necessary control measures, without the extreme vigilance on the part of the authorities.

Based on the second Hypothesis, countries with high Masculinity index, LTO and High indulgence will experiment higher death tools within a global pandemic. These results are in accordance with Hofstede (2020) proposal and are confirmed in the present research. High index Masculine societies do not share the drivers of consensus, taking care of others and concern for quality of life, the same way Low index societies do. These drivers result critical in order to propose a national response that will be widely accepted and more universally pursued. As Gupta (2017) reports, consensus represents a key response element within a crisis scenario. Group decision making requires a broad consensus level in order to successfully implement policies that will benefit the entire society. High Masculinity index countries might experience difficulties reaching this consensus, thus, negatively affecting the decision-making process, as well as the effectiveness of the proposed policies, especially during critical times.

Countries with a high LTO seem to be better prepared to respond to cyclical recurrent crisis scenarios. On the contrary, based on the present results, in the event of a disruptive crisis such as a global pandemic, LTO countries might lack the ability to adjust immediately to the new unknown situation. Short term-oriented cultures, might have incentives to remain hyper vigilant due to their lack of planning strategies and possess higher adaptability skills developed along their history. These results are aligned with Cho and Lee (2015) findings about how cultural dimensions affect country responses as well as risk perception, influencing individual as well as group behavior.

The results of the present research confirm Hypothesis 2 and are consistent with Travica (2020) findings. Individuals who belong to high indulgence cultures exhibit less control over their desires and impulses. During a crisis such as a global pandemic, the society as a whole might have more difficulties accepting the new normality. Simple things that give meaning to their lives, such as enjoying leisure time, might be put on hold. This low degree of control over the impulses might foster behaviors that set them in high-risk scenarios. The previous step to implementing any policy in order to address this dimension would consist on the country becoming aware of its degree of indulgence.

Based on the third hypothesis, countries with high Masculinity index, high Individualistic index, high Power Distance and high Indulgence will experiment higher dead ratio among nations during a global pandemic. The present results confirming Hypothesis 3. All variables within this hypothesis have been addressed in the previous paragraphs. The proposed policies are discussed in the following section.

The fourth hypothesis takes into consideration two sets of countries within a common geographical area (Europe). The first group corresponds to three Scandinavian nations (Norway, Finland, and Sweden). The second group corresponds to three Mediterranean countries (France, Spain and Italy). The results are aligned with Hypothesis 4 stating that based on their cultural dimensions, Mediterranean European countries will experiment higher dead ratios than Scandinavian countries during a global pandemic, despite Mediterranean countries having lower GDP per capita. These results differ from hypothesis 1 of the present research, as well as with the proposal by Williams et al. (2000) on the assumption that countries with a higher GDP per capita will experience higher death ratios during the current pandemic. An explanation for this might be found in the studies by Higgins et al. (2008) and Kurman and Hui (2011), whose findings confirm that individuals, under stressful scenarios such as a global pandemic, will embrace their default cultural values, overriding the potential effect of other variables, such as GDP per capita.

Policy implications

In terms of policy recommendations based on the present findings, low power index countries could make use of the concepts of social responsibility and mutual obligation in order to promote compliance with control measures. High power distance countries

could rely on respected country figures, experts and highly recognize public personalities, in order to channel the messages that will help fight the virus spread, such as keeping social distancing and the use of proper hygiene and disinfection measures. This could increase the degree of compliance in high power distance countries, helping to reduce the total number of deaths.

Establishing policies to raise awareness on how personal actions can harm the group as a whole among citizens from countries with high individualistic indexes might also help increase the compliance rate with virus control measures, decreasing the number of deaths. Raising awareness through media campaigns could result a more acceptable policy within high individualistic countries, rather than relying immediately on hypervigilance and force to implement the necessary control measures.

Countries with a high masculine index could benefit by implementing policies that will assure unity of action among the political forces at national level. Creating a national unity crisis body where all the political parties are represented might help raise consensus and involvement. Furthermore, the national government could establish appropriate and continuous channels of communication with the local governments, in order to receive, evaluate and take into consideration within the national decision-making process the particularities of each region. These policies might help prevent conflicts and allow solving them when they arise.

Policies that foment adaptability at country level can be implemented in order to foster the LTO adaptability competency at national level, addressing it within the academic curricula. Due to the amount of time this might require, countries with a high LTO could benchmark their decisions in real time during the crisis with other nations who have a lower LTO index and be prepared to adopt the most successful ones.

The higher the degree of indulgence within a country, the strongest the awareness campaigns governments would have to develop to convince the population not to engage in activities that might set them at risk. Countries such as Spain, Italy and France successfully developed in the 90′s road safety campaigns to reduce the number of deaths with explicit and distressing radio and television advertisement. These practices might show most effective within high indulgence cultures.

Taking into consideration policy development specifically for the North and South European countries, the goal consists of identifying the most significant cultural dimension differences among the countries under study that might be related to the very different death ratios observed between the two groups, and understanding why these countries behave in a different way than expected based on their GDP per capita. Based on the analysis, the higher degree of Power Distance, Masculinity and LTO for European Mediterranean countries, could account for their higher dead ratio versus Scandinavian countries. According to Fernandez et al. (2018), each country unique context, might require specific policies based on its distinctive competencies. In the case of Scandinavian countries, policies should be based on its low Masculinity index cultural dimension, which will allow these countries to reach consensus and a broader acceptance and compliance with new norms, regulations and recommendations in order to reduce the number of deaths. For European Mediterranean countries, their high-Power Distance index (especially for France and Spain), represents the main policy driving force, in order to reduce the number of total deaths due to the global pandemic. We propose the policies to control the pandemic might be implemented through norms and obligations in Mediterranean European countries, in order to achieve the highest degree of compliance and reduce their population death rations, while Scandinavian countries might rely on guidelines, consensus and recommendations to pursue the same goal.

Conclusion and limitations

The purpose of the present research consists in identifying the cultural dimensions that affect country death ratios during a global pandemic, and propose policies aligned with these cultural dimensions, in order to reduce country death rates. According to the results, the death ratio will be higher in countries with high degree of Power Distance, Individualism, Masculinity, LTO, Indulgence and GDP per capita. Taking into consideration the research results, we present the following policy recommendations.

Since countries with a high GDP per capita might be more exposed to the spread of a global pandemic due to its higher degree of global interconnection, establishing early detection protocols will allow them to identify the threat in the preliminary stages. Implementing critical control measures in the initial stages will help decrease drastically the spread of the pandemic. While low power index countries could focus on social responsibility to promote compliance, high power distance countries could rely on well recognized public figures to support official communication channels in order to increase awareness and compliance levels within the population. Individualistic countries could also obtain a greater benefit by increasing awareness through media campaigns about the consequences of a pandemic. High Indulgence index countries would also be the ones who benefited the most from policies that foster awareness about the risk and the social and economic consequences of a global pandemic. Collectivistic countries on the other hand, could benefit more by adopting policies aligned with surveillance and strong control.

Masculine societies will be the ones who benefit the most during a pandemic scenario by adopting policies that foster unity of action at local, regional and national levels. Creating an emergency management cabinet with the involvement of all social, political and economic stakeholders would help rise consensus for the adoption and implementation of pandemic control measures. Finally, we propose the adoption of real time benchmarking policies among countries with similar cultural dimensions. This would allow implementing successful containment measures in the most effective time manner.

One of the findings of the present research relies on the fact that cultural dimensions affect death ratios as stated in the first three hypothesis, when considering the first group of the 46 most affected countries. Regarding hypothesis four, for the Scandinavian countries that are part of the second group of the study, two of the six cultural dimensions (UA and Indulgence) behave in opposite direction than expected. This might imply that every country specific cultural context should be studied before implementing policy recommendations.

One of the most important limitations of the present study is based on the western focus of the proposed research models. During the last decade, Asia's growth clearly surpasses the growth of any other area of the world. Furthermore, Asia concentrates at this moment fifty percent of the world population. As a future line of research, and in order to overcome this limitation, we propose contrasting the present results with Lewis (2010) model framework in order to confront the present findings.

A second limitation relates to the very dynamic nature of a global pandemic. The present results and policies might be better suited to response during the first phases of a pandemic, since countries can adjust their strategies based on the evolution of the emergency. Finally, countries might use different criteria to classify deaths related to the pandemic. Protocols might vary from counting all confirmed cases as virus related deaths, to not taking into account deceased who had underlying health conditions. The implementation of a global counting standard protocol by supranational organizations such as the WHO, could prove an effective policy in order to better report and record the cases along a global pandemic. This would allow establishing a more solid ground when analyzing countries death rations and developing policy recommendations.

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