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Does socioeconomic condition affect the spread out of Covid-19? comparative study of Asian and European countries

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The Coronavirus or COVID-19 is a disease based on an unknown virus which has created a huge chaos in world, the virus is not only costing human lives but it also creating a massive economic loss to the whole world. The objective of current study is to test the relationship of different socio-economic variable with the spread of COVID-19. In order to achieve this objective the current study has employed a country wise cross sectional data in which two pools of European and Asian countries are specified. The study consider the population, population density, age, GDP, HDI and hand washing facilities as the socio-economic factor that can affect the spread of COVID-19. The OLS technique has been considered as a tool for the analysis. The study yielded that socio-economic condition does affects the spread of COVID-19 in both the European and Asian countries. The study concluded that population is most important factor that determine the spread of viral disease along with population density as well. Furthermore the study came up with the policy implication that policy makers should consider the importance of socio-economic factors along with the biological factors in order to formulate policies that can result in the prevention of COVID-19.

Keywords: COVID-19, Coronavirus, Socio-economic condition, Europe, Asia

Introduction

The Coronavirus or COVID-19 is a disease based on an unknown virus which creates a huge chaos in world. It was first identified in Wuhan, China in December 2019 after that it had a rapid spread and World Health Organization (WHO) soon realized the severity of the situation and declared a "public health emergency of international concern" on 30 January 2020 (WHO, 2020d). Within a short period, the reported cases grew exponentially all over the world; as a result, the WHO declared COVID-19 a "pandemic" on March 11, 2020 (WHO, 2020c). The main purpose of this study is to analyze the role of Age, Gross domestic product (GDP), population, population density and Human development index, Hand washing facilities in the spreading of COVID-19 disease in an Asian and Europeans countries.

Evidences highlight that older people don't have as strong immune system so they are more vulnerable to infectious diseases. Because they are facing other type of diseases like heart disease, lung disease, diabetes or kidney disease, which weaken their body ability to fight infectious diseases. Regarding the COVID -19 diseases there exist fundaments that older people become more

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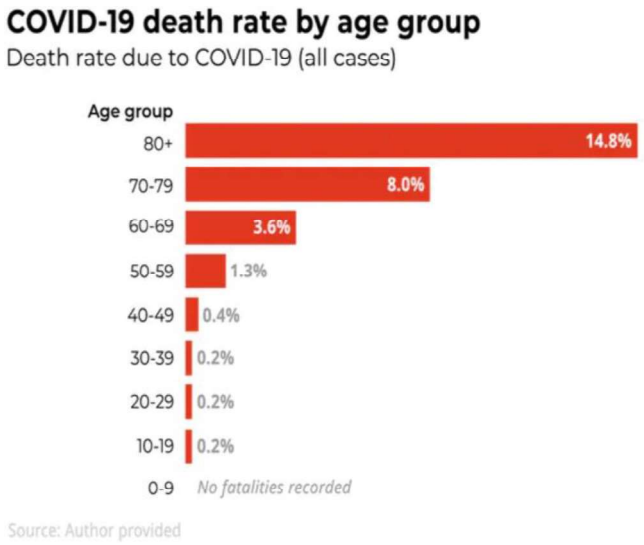
infected due to coronavirus (Vally, 2020). People over 65 years of age especially over 80 are more likely to have severe, life-threatening disease, even if their general health is good (Hafner, 2020). Evidence from the study of Valley (2020) People aged 80 and over 80 years approximately 15% of these infected died. The ranges of death rate for the age of 50 and below is between 0.2- 0.4% (Vally 2020).

Simultaneously, different studies find that countries have developed economy also have developed health care system. Regarding the study of Rana et al. (2020) 43% change in global health expenditure growth explained by economic growth. In reality countless studies find that there is a positive relationship between the economic development of a country and population health (Achim et al. 2019, Biggs et al.2010; Strittmatter and Sunde, 2013). According to the study of urban institute (2015) the lower income people report weaken health and have many chances to be unveiled for the disease. From a socio-demographic point of view, low population density face higher burdens to achieve coverage of some health services (Hanlon et al.2012), higher level of health ensured by less medical illness(Bradshaw et al. 2019) and Population density increased the number of chronic diseases decreased (Costa, 2008).

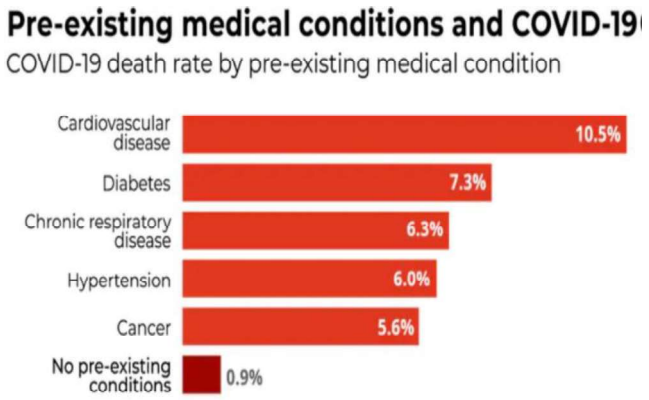
Vally (2020) older people more at risk of coronavirus. As we know about the covid-19, it is increasing due to the higher risk of severe illness and death is increases with age. Those children whose age is nine or more than nine years at least little infected or mild symptoms therefore no one have died due to infection.

Those peoples whose age is 80 year and also facing chronic diseases become more infected. For those whose 80 years almost 15% of these have died.



The death rate starts to increase for those over 50 years of age. Those under 50 years who are infected have a death rate of 0.2-0.4%, while for those 50-59 years it's 1.3%. For those 60-69 years it's 3.6%, for 70 to 79 year olds it's 8.0% and for those over 80 years of age it is14.8%.

A similar picture is emerging when looking at the increased risk of severe illness and death of those with underlying conditions.



The death rate of those who have no chronic diseases is approximately 1%. For those with cardiovascular (heart) disease the death rate is 10.5%, for diabetes it's 7.3%. Chronic respiratory disease (such as asthma and chronic obstructive pulmonary disease) has a 6.3% death rate, for hypertension (high blood pressure) it's 6.0% and cancer is 5.6%.

This study highlighted that the people who has more aged and suffering in others diseases like heart, diabetes, cancer and hypertension become more infected and died.

Literature review

According to the Oxford Economics forecast, the coronavirus epidemic has slowed down world GDP growth from 2.6% to 1% and has "taken away" at least $1.1 trillion (Felipe et al., 2020). Against the background of an already stagnant economy, a recession may begin, and then a global crisis.

To contain the exponential spread of the virus, countries worldwide have taken various measures ranging from over-all isolation, border cessations, quarantines, travel limitations, and businesses' complete closures. This has mainly led to a decrease in the supply of goods, intensified by a panic accumulation of stocks and a downfall in demand due to people's self-isolation. More importantly, the global pandemic has also led to a considerable upsurge in demand for healthcare and/or medical products and equipment. Carter and May (2020) claimed that health experts directly put forward several sanctions as the first line of defense to decrease the coronavirus's spread, such as "face masks," "frequent hand washing," "social distancing," and "self-isolation." All these measures tend to have significant implications for businesses globally.

The coronavirus has brought economic costs and is sure to cause an unprecedented economic downturn around the world. The unstable nature of the virus makes it difficult to develop the right macroeconomic policy to contain it. Carter and May (2020) further claimed that that COVID-19 provoked an economic crisis worldwide, and it can be as infectious economically as it is medically. It has been assumed that while the scale of the pandemic's impact is unpredictable, the global economic crisis it triggered is likely to drag on for a long time and possibly trigger significant structural changes in the global economy. For example, traditional trade gave way to online shopping, which affected food and vegetables. But the major first economic shock to shock the world was the most significant one-day oil price crash in three decades.

Epidemiological investigations during the WHO-China Joint Mission on COVID-19 found many infections clustered around households. When there

was taking extreme physical distancing measure closing school, colleges university and workplace to reduce the spread out of COVID-19 and avoidance of any public gatherings all at once. One side this measure taken to reduce the COVID-19 due to the close contact between people but other side it can push the transmission to the household. Because most of the people cannot go outside due the fear of COVID-19 but gathering and close contacts between the family members are increases which become the cause of spread of COVID-19 at home.

Being concerned with the fast spread of COVID-19, a limited scholars, principally in India, have made efforts to understand the nature dynamics of the COVID-19 pandemic to model and estimate the pace of transmission and rates of mortality (Khajanchi & Sarkar, 2020; Samui et al., 2020; Khajanchi et al., 2020). Similarly, Acharya and Porwal (2020) have also judged that population which is infected and the rates of mortality due to the infection depend on the demographic composition of the population in the different states of India. All these studies highlighted the essential for continuing physical distance and social distance to control the spread of the COVID-19. Recognizing the significance of maintaining physical distance, due to the strong lockdown imposed by government has saved the lives of the many people in this region.

Global impacts of Covid-19 pandemic

Enhanced poverty

The coronavirus could push up to 400 million people into extreme poverty, defined by the World Bank as on living on less than US$ 1.90 per day- The average poverty line low income in developing countries. This number rises to over 500 million if using the World Bank higher average poverty lines for lower middle income US$3.20 and upper middle class US$5.5developing countries. A lot of study conduct from 1950 to1991, there are twenty countries including developing, developed and under developing countries, revealed that increasing the infection diseases will not only increase mortality and morbidity, but also increase in the poverty (World Bank).

Financial market impact of the COVID-19

Economics turmoil associated with COVID-19 pandemic has had wide-ranging sever impact of financial market; include stock, bond, and commodity including crude oil and gold market. The crude oil prices and a stock market crash in March 2020.the effect upon the markets are the parts of the coronavirus recession and among the many economics impacts of the pandemic. Owing to COVID-19 World economy have been plunged by 4.9% (IM, 2021) .

COVID-19 and education

Most governments around the world have temporally closed educational institution in an attempt to contain the spread of COVID-19 pandemic. These nationwide closures are impacting hundreds of millions of students. Several other countries have implemented localized closures impacting millions of additional learners. UNESCO is support countries in their efforts to mitigate the immediate impact of school closures, particularly for vulnerable and disadvantages communities, and to facilitate the continuity of education for all through remote learning.

Mental health and COVID-19

Fear and worry, and stress are normal response to perceived or real threats, at times when the world peoples facing uncertainty or unknow.so it is normal and understandable that people are experiencing fear in the context of the COVID-19 Pandemic. Added to the fear of contracting the virus in a pandemic with such a COVID-19 are the significant changes to our daily live as our movement are restricted in support of efforts to contain and slow down the spread of the virus. Faced a new reality wording at home by the peoples temporarily unemployment, home schooling

of children, and lack of physical contact with other family member and friends and colleges.

Reduce pollution during COVID-19

Lock down due to COVID-19 reduces the transports activity which result a less energy consumption and lower oil demand. These changes in the transport activity and oil demand exert a significant impact on the environmental quality. NASA (national Aeronautics and space administration) and ESA (European Space Agency) released fresh evidence which suggest that environmental quality improved and emission of NO2 reduce up to 30%.

Reduce travelling and tourism

The COVID-19 pandemic has had a significant impact on tourism industry due to resulting travelling restriction as well as slump in demand among travelers. The tourism industry has been massively affected by the spread of COVID-19, and many countries have introduce travel restriction in attempt to contain its spread. United Nation World Tourism Organization estimated that global international tourism arrivals might decrease by 20-30% in 2020 leading to potential loss of US$ 30-50 billion. In many of world cities, planned travel went down by 80-90%. COVID-19 inflicted losses of $80 billion to tourism industry by restricting 80 million arrival (UNWTO).

Research methodology

The role of economical, biological and demographical factors is very important to explain the spread of this virus. According to the latest data provided by World Bank the current study uses the Population variable which represents percentage of total Population for the age of 65 and above. For Economic development the Gross Domestic Product (GDP) per capita is used, for which the data is taken from the World Development indicators (World Bank, 2020).The socio-demographical Population, population density represented people per sq. km of land area, Human development index, Hand washing facilities for which the database of World Bank (WDI, 2020). The study uses cross- sectional data for the samples of 73 Asian and European countries. Which are affected by COVID-19 disease and Ordinary least squares (OLS) technique is employed for the analysis for which the below the model is specified.

Table 1: Details of the variables

Variables	Description	Source of Data
Dependent Variable		
COVID-19 victims	The number of total cases	Our world in dataset
Independent variables		
GDP	Measure in US dollars at the constant price of 2010	World Development indicators
Population	Total Population of respective countries	World Development indicators
Age	% of total population for 65 and above years age group	World Development indicators
Density	People per sq. km of land area	World Development indicators
HDI	Human development index	World Development indicators
HW	Hand washing	World Development indicators

$$Covid-19i = \beta_0 + \beta_1 GDP_i + \beta_2 age_i + \beta_3 density_i + \beta_4 HDI + \beta_5 Population + \beta_6 HANDWASHING + +\varepsilon_i \qquad (1)$$

Where COVID-19 represents the quantification of COVID-19 effects (total cases) in the country I; Gross domestic product (GDP) is measured in US dollar per capita; Age represents population aged 65 and above (% of total population); Density represents the population density (people per sq. km of land area); infects.

The study further uses the logarithmic transformation of variables for COVID-19, Gross domestic product (GDP), Age, population density, Human development index, Population, and Hand washing. Thus the model becomes

$$LogY_i = \beta_0 + \beta_1 LogX_i + \varepsilon_i \qquad (2)$$

Where Yi denotes the covid-19 total infected and Xi denotes GDP, Age, Density, Human development index, Population, Hand washing.

Conclusion

The current study investigates the effects of socio-economic conditions and spread of the COVID-19 disease. For this purpose the study used a logarithmic transformation of the considered variables and plotted in an econometric model. The OLS technique was applied on the model in order to gain the results. The results showed a positive relation of population with COVID-19 cases for both European and Asian countries, this relationship depicts that a country with more population yields a high number of COVID-19 cases. The study yielded a positive relation between population density and COVID-19 cases for European countries as there relation was significant but this relation was not find for the countries of Asia. A negative and a significant relation of age with COVID-19 cases was found and their relationship was negative which concludes that spread of COVID-19 is not only related with people have more than 65 years of age, this relation was only established for Asian region. GDP was not correlated with the spread of COVID-19 for both of pools of Europe and Asia while HDI was found as a significant factor for the spread of COVID-19 in Asian countries depicting the effect of economic condition on spread of COVID-19. Hand washing facilities carries the expected negative sign with COVID-19 case in both of the OLS analysis but this relationship was not significant. In conclusion the socio-economic does affects the spread of COVID-19 cases depending on the economic condition of countries.

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