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Effect of Median Age of Countries Population on the Total Number of Covid-19 Cases and Deaths around the World

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ABSTRACT
COVID-19 (Coronavirus disease) is an infectious disease which is caused by a newly discovered coronavirus. Most of the people infected with the COVID-19 virus will show mild to moderate respiratory illness and recover without the necessity of special treatment. Median age is an important indicator of the population's age distribution. It provides the 'midpoint' age of a population. The aim of this review is to provide the evidence on the role of median age or young population of a particular country with regard to transmission rate of the spread of disease and deaths. The median age of all the affected countries were divided into four class intervals such as (15-25, 26-35, 36-45, and 46-55). The total number of Covid-19 cases and deaths of affected 209 countries/territories as on 13th April, 2020 were summarized according to their median age. Hence from the review, it can be concluded the total number of both cases and deaths are higher in countries with higher median age. From the survey reports of India and South Korea, it is clearly observed that the chances of infections is more in young people and the chances of fatalities are more in older people. Thus, in view of the data it can be said that the younger population is getting affected more, and hence perhaps with less number of deaths. That indicates that younger adults without realizing may be spreading COVID-19. Thus, the best approach for controlling the spread of COVID-19 seems to isolate older people and those with underlying medical conditions from the younger people.

Key-words: *COVID-19; Median age; Cases; Deaths.*

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I. INTRODUCTION

Several pneumonia cases of unknown etiology have been reported on 8th December, 2019, in Wuhan, Hubei province, China.[1-3] Most of the patients were found to live or work at around the local Huanan wholesale seafood market, where live animals were sold. On 7th January, 2020 the Chinese Center for Disease Control and Prevention (CDC) has identified a novel coronavirus from the sample of throat swab of a patient. The novel coronavirus was subsequently named as 2019-nCoV by World Health Organization (WHO).[4]

The official name of the 2019 novel coronavirus was then announced by WHO as coronavirus disease (COVID-19).[5] Within a month, this coronavirus quickly spread throughout China during the Chinese New Year, a time when there is a high level of mobility among Chinese people.[6]

COVID-19 (Coronavirus disease) is an infectious disease which is caused by a newly discovered coronavirus.[7] Most of the people infected with the COVID-19 virus will show mild to moderate respiratory illness and recover without the necessity of special treatment.[7] Elderly people, and those with underlying medical problems like diabetes, cardiovascular disease, cancer and chronic respiratory disease are more susceptible to develop serious illness.[7] The COVID-19 virus primarily spreads through saliva droplets or nasal

discharge when an infected person sneezes or coughs. Hence, it is important to practice respiratory etiquette (for ex. by coughing into a flexed elbow).[7] At this time (i.e. 13th April, 2020), no specific vaccines or treatments are available for COVID-19. However, many ongoing clinical trials are evaluating for potential treatments.[7]

By considering the spread of Covid-19 and its impact on the health of human beings, the community of research has rapidly responded to the new virus and several preliminary researches about this epidemic have already been published. Many of the research data available have correlated the total number of COVID-19 cases and deaths with respect to sex[8], climate[9], BCG vaccination[10] and age which is the most important factor briefly discussed in this review etc.

Need for the study:

The transmission rate of infection and death also depend on a various factors like general health, age and the care accessed to the patient. A new report from the Center for Disease Control and Prevention (CDC), US confirm that COVID-19 does not spare young generation (i.e. ages 23 to 38 in 2019). As in U.S. among the first 4,226 cases, more than half of the hospitalized patients were under the age of 65, and one in five were aged between 20 to 44. So far, majority of the confirmed cases in California have been in younger people under the age of 50.[11] In South Korea, where the testing for Covid-19 diagnosis has been widespread and is available even to asymptomatic people, has reported nearly 27 percent of the confirmed cases are people under the age of 20, by far the most infections seen in this age group.[12] Whereas in India on 6th April, 2020 it was found from the analysis of the age group of Covid-19 patients shows that the maximum 42% are of 21-40 years, 33% of 41-60 years, 17% are above 60 years and 9% are of 0-20 years.[13]

Moreover, the China statistics said that 80% of COVID-19 cases are mild, only 20% are severe or critical, and that the vast majority of deaths are seen in the elderly and the people with underlying health conditions. In the first large analysis of more than 44,000 cases from China, the chances of deaths were at least five times more common among the confirmed cases with diabetes, heart or high blood pressure or breathing problems.[14] In India, according to the Union health ministry data published on 10th April, 2020, about 63% deaths have been reported among people aged 60 and above, 30% among people between 40 to 60 years and 7% among people below 40 years.[15] In Italy, some 41% of all those patients who died were of the age between 80-89, with the 70-79 age group further accounting for a 35%. A deeper analysis of 481 Italian deaths showed that almost 99% of them were suffering from one or more underlying medical conditions before infecting with the virus. Some 48.6% had three or more previous pathologies. A total of 73.8% had high blood pressure, 34% had diabetes and 30.1% had heart disease.[16]

Thus, in view of the above data it can be observed that the younger population is getting affected more, and hence perhaps with less number of deaths. Whereas, fatality rates are higher among older population.

Aim of the study:

Median age is an important indicator of the populations age distribution. It provides the 'midpoint' age of a population. It means there are same older number of people than the median age as there are younger than it. In 2015, the average global median age was 29.6 years which indicates half of the world population were younger than 29.6 years, and half were older. The youngest was Niger (country of West Africa) at 14.9 years and Japan (country of East Asia) had the highest median age at 46.3 years.[17]

If the total number of Covid-19 cases and deaths are compared continent wise then from Worldometer website on 13th April, 2020 it is clearly visible that Europe has the highest number of Covid-19 cases and deaths followed by North America, Asia, South America and Africa.[18] It can clearly be understood that is because the majority of European countries has the highest median age, whereas the majority of African countries has lowest. Thus, it indicates that median age has a significant effect on the total number of Covid-19 cases and deaths.

But there are some countries within the continents which are having wide variation in their median ages. For example within Africa, South Africa country is having almost double the median age 28 year in comparison to Niger which is only 14.8 year. Also in Asian countries, China is having the median age of 38.4 year and that of India is 28.7 year (i.e. almost 10 years difference).[19]

Hence in this review irrespective of continent, we did a comprehensive exploration and critically analyzed the effect of median age of a particular country population with respect to total number of COVID-19 cases and deaths. The aim of this review is to provide the evidence on the role of median age or young population of a particular country with regard to transmission rate of the spread of disease and deaths. This review can be useful for future research related to this topic and may also support the decision making strategies of government to control this public health emergency at the community, national, and international levels.

II. METHOD

In the present review, the total number of COVID-19 cases and deaths of various countries around the world were compared with their respective median age. The data relevant to total number of COVID-19 cases and deaths of countries was collected from Worldometer website regarding Coronavirus update and summarized. Worldometer is a website for reference that provides counters and real time data for various topics. It is owned and operated by Dadax, a data company, which makes revenue through online advertising. This website is a part of the Real Time Statistics Project, and is managed by an international team of researchers, volunteers and developers. From the Worldometer website, it was found that as of 13th April, 2020, some 209 countries/ territories have been affected by the COVID-19 pandemic with 1,910,970 infected patients and 118,603 deaths, representing a 6.20% mortality rate. While, at the time of writing, USA is the most affected country and the rate of infection in China, Italy and Spain has slowed down significantly.[18]

Whereas, the data relevant to median age of the respective countries was collected from the World Factbook. The World Factbook, which is also known as the CIA World Factbook, is a resource for reference produced by the Central Intelligence Agency (CIA), USA with information about the countries of the world. The Factbook is available as a website that is updated every week. However, frequently it is used as a resource for news articles and academic research papers.[19]

For better understanding of review, the median age of all the affected countries were divided into four class intervals such as (i.e. 15-25, 26-35, 36-45 and 46-55). The total number of Covid-19 cases and deaths of affected 209 countries/territories were summarized according to their median age.

III. RESULTS:

The findings of the analysis were found to be interesting and are represented in the form of Tables and graphical representation as mentioned below-

Table 1: Effect of median age on countries/ territories with respect to total Covid-19 cases and deaths as on 13th April, 2020

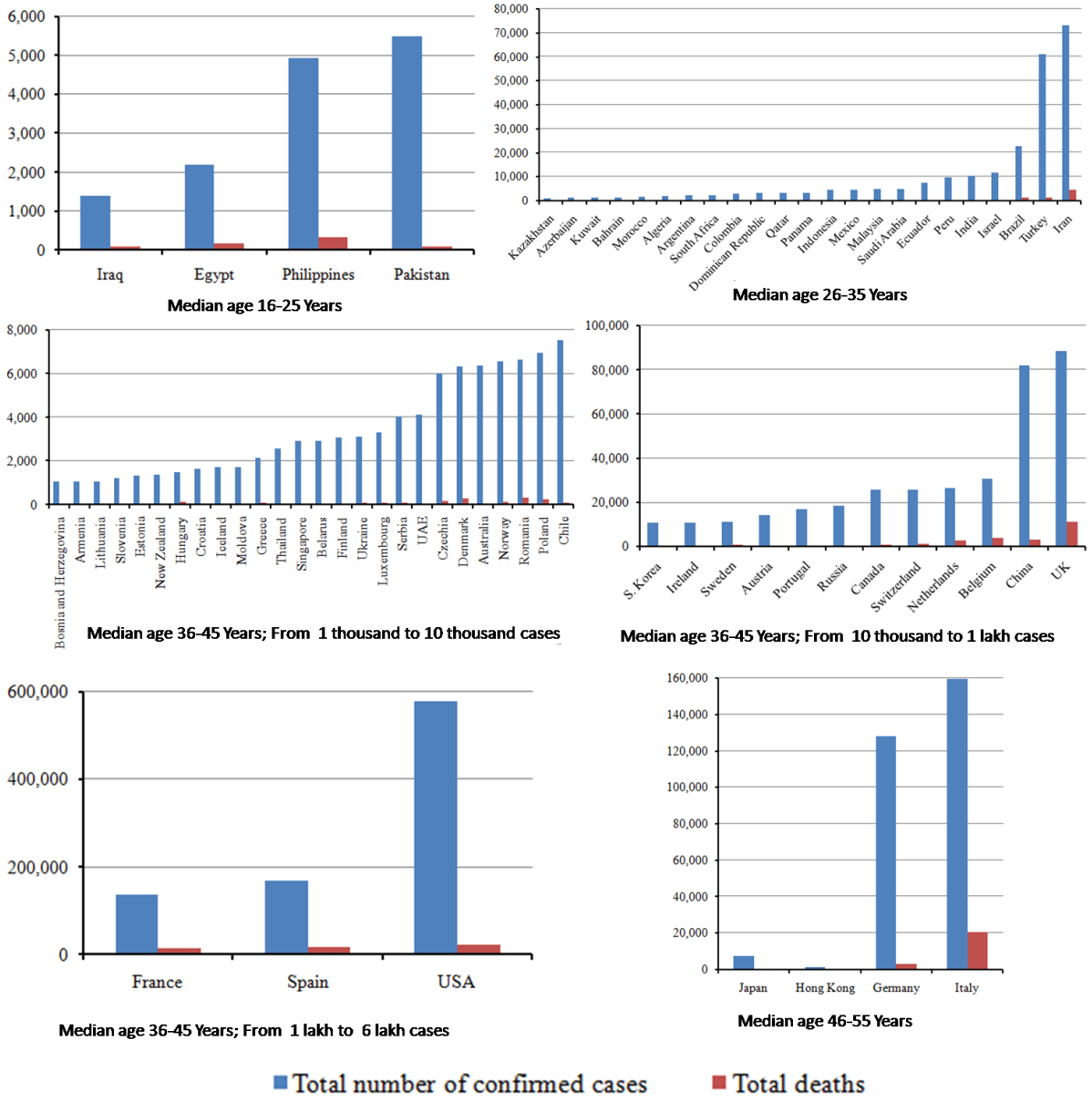
SI. No.	Median age (Class interval)	No. of Countries/ territories	Total Covid-19 cases	Total Covid-19 deaths	Death rate (%)
1	16-25	63	22594	876	3.877
2	26-35	61	248221	10178	4.1
3	36-45	76	1343302	83884	6.244
4	46-55	9	296853	23665	7.971
	Total	209	1910970	118603	Average death rate =5.548

Table 2: Number of countries/territories with Covid-19 cases as on 13th April, 2020

SI. No.	Median age (Class interval)	No. of countries/ territories with Covid-19 cases			
		Less than 1000	1000 – 100,000	More than 100,000	Total
1	16-25	59	4 (less than 6000)	0	63
2	26-35	38	23	0	61
3	36-45	35	38	3	76
4	46-55	5	2	2	9

Table 3: Number of countries/territories with Covid-19 deaths as on 13th April, 2020

SI. No.	Median age (Class interval)	No. of Countries/ territories with Covid-19 deaths			
		Less than 500	500 – 10,000	More than 10,000	Total
1	16-25	63	0	0	63
2	26-35	20	3	0	23
3	36-45	30	42	4	76
4	46-55	4	3	2	9



Note: 1) The data of number of Covid-19 cases and deaths was collected from Worldometer website on 13th, April 2020. 2) The data of countries showing less than 1000 cases have not been included in this graphic representation.

Figure 1: Data showing the total number of Covid-19 cases and deaths of various countries with respect to median age

IV. DISCUSSION:

From the above tables and graphic representation, it is observed that

1. In **Table 1**, in the 3rd class interval median age (i.e. 36-45), the total cases and deaths of 76 countries is many times higher than total 124 countries of 1st (i.e. 16-25) and 2nd (i.e. 26-35) class intervals respectively. In the 4th class interval median age (i.e. 46-55), it is clearly visible that the total cases and deaths of 9 countries itself is more than the 63 and 61 countries of 1st (i.e. 16-25) and 2nd (i.e. 26-35) class intervals respectively. Hence, it indicates that as the median age of a country increases then the total number of Covid-19 cases and deaths also increases. The effect is clearly visible in **Table 1** from 1st to 4th class intervals.
2. In **Table 1**, as the median age increases the death rate also increases as it clearly visible from 1st median age class interval to 4th median age class interval.

3. In **Table 2 and 3**, in the lowest median age class interval (i.e. 16-25) almost all the 63 countries have not shown more than 6000 cases and the deaths were also less than 500. Whereas, 2nd (i.e. 26-35), 3rd (i.e. 36-45) and 4th (i.e. 46-55) class intervals, it can be seen majority of countries have shown more than 1000 cases and even some countries have shown more than 100,000 cases. It is clear indication of the effect of median age of that particular country population.

In one of the report from Chinese Center for Disease Control and Prevention, it was said that 81% people infected with the Covid-19 will present with mild or few symptoms, others may require a ventilator to breathe or will not be able to breathe properly.[(20)] Also as per WHO, the risk of disease severity gradually increases with age starting from around 40 years.[(21)] From observing the above data in **Table 1,2** and **Figure 1**, it can also be understood that less median age countries have shown less number of Covid-19 cases because the young age people may be asymptomatic or showing only mild or few symptoms which are making them less suspects to be tested for Covid-19. Hence, majority of less median age countries may be doing few tests and thus less number of cases is reported.

WHO, in their 51st report said that the virus that causes COVID-19 infects people of all ages and based on the evidence to date suggests that two types people are at a higher risk of getting severe COVID-19 disease. One who are older people (i.e. people above 60 years old); and the other those with underlying medical conditions (such as diabetes, cardiovascular disease, cancer and chronic respiratory disease).[(21)] From the **Tables 1, 3** and **Figure 1**, it can be clearly seen that as the median age of a country increases the total number of deaths also increases. Because as the age increases, the immune system becomes weaker and thus the ability to fight off infections decreases. Also, the chances of underlying medical conditions increase in people above 60 years old.

V. CONCLUSION

Hence, from the above review it can be concluded the total number of both cases and deaths are higher in countries with higher median age. From the survey reports of India and South Korea, it is clearly observed that the chances of infections is more in young people and the chances of fatalities are more in old people. Thus, in view of the above data it can be said that the younger population is getting more affected, and hence perhaps with less number of deaths. That indicates that younger adults without realizing may be spreading COVID-19. Thus, the best approach for controlling the spread of COVID-19 seems to isolate older people and those with underlying medical conditions from the younger people.

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