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Prevalence and death rate of COVID-19 in some selected countries and its socio-economic impacts in Khulna division of Bangladesh

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ABSTRACT

Background: 2019-nCoV has been declared by WHO as a global pandemic in March 2020. The present study was undertaken to find out the global as well as local prevalence, and death rate of COVID-19.

Methods: A developed questionnaire was used in Khulna division of Bangladesh to record the percentages of people who were mask user, involved with different risk groups, harmed by socio-economic impacts of COVID-19, involved with the issue of government taking measures for controlling COVID-19. Some of the highly risk countries of the world were selected for recording the data.

Results: As of October 20, 2020, we found USA, and Bangladesh at 1st and 17th position respectively in terms of global prevalence of COVID-19. We found Dhaka at 1st position in terms of division wise prevalence in Bangladesh. In terms of death rate of COVID-19, Mexico reported 10.10% death rate by securing 1st position. We recorded the data related with percentages of people who were involved with mask using and risk groups like hypertension, diabetes, respiratory illness, smoking; harmed by socio-economic impacts of COVID-19 that changed their lives, believers of different levels on government taking measures for controlling the spread of COVID-19 from Khulna division.

Conclusions: The findings of this research work would certainly help the government of highly risk countries as well as Bangladesh to take appropriate measures to control COVID-19. Moreover, it will be helpful for the government of Bangladesh to take necessary steps to mitigate the socio-economic crises existing among the people.

Keywords: COVID-19, SARS-CoV-2, WHO, Pandemic, Prevalence, Death rate

INTRODUCTION

The novel coronavirus 2019 (COVID-19) is a highly contagious disease which has not been previously identified in humans. It is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) belonging to the genus β -corona virus and family *Coronaviridae*. SARS-CoV-2 is an enveloped, single-stranded positive-sense RNA virus with genome size of

22-32 kb in length. Incubation period of this disease varies from 1-14 days. Case fatality rate of the 2019-nCoV is 3.5% or around 2%. People of all ages can be infected by the SARS-CoV-2. Older people, and people with pre-existing medical conditions like asthma, diabetes, heart disease appear to be more vulnerable to COVID-19. The most commonly reported clinical symptoms are fever, dry cough, headache, dyspnea, myalgia, respiratory distress, renal impairment, diarrhea,

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and multiple organ failure.² SARS-CoV-2 is likely to be present in an animal reservoir, and has recently started the epidemic in humans through zoonotic transmission.^{3,4} Transmission of SARS-CoV-2 occurs through respiratory droplets, aerosols, fomites, fecal-oral route.2 At first, it was appeared in Wuhan city of Hubei province of China during December, 2019, and the world health organization (WHO) declared COVID-19 as a pandemic on March 11, 2020. On March 8, 2020, the first three coronavirus positive cases in Bangladesh were detected, and on march 18, 2020 first COVID-19 death of over 70 years old person carrying other morbidities was reported.⁵ The unprecedented confrontation of COVID-19 has created great challenge to the healthcare sector, especially in developing countries like Bangladesh.⁶ During this pandemic, Bangladesh experiences some noteworthy socio-economic challenges such as incorrect perception about COVID-19, lack of proper health education, lack of IT knowledge, the uncertainty of long-time lockdown, unemployment rates.⁷⁻⁹ A smart mobile phone application (Corona Tracer BD) has been launched by the information communication technology (ICT) division of the government of Bangladesh, and the directorate general of health services (DGHS) for providing the latest research based information regarding COVID-19, indicating nearby health and testing facilities, the latest the pandemic, statistics on and government announcements. Real-time reverse transcription PCR (rRT-PCR) detection of SARS-CoV-2 is currently the most reliable diagnostic tool for COVID-19.10 There are no effective drugs for COVID-19, only symptomatic treatment is available. As of October 19, 2020 a total of 44 COVID-19 candidate vaccines are in clinical evaluation in the world (Draft landscape of COVID-19 vaccines). Bangladeshi scientists, pharmaceutical companies are trying hard to develop COVID-19 candidate vaccines. Recently WHO has listed the COVID-19 vaccine developed by a Bangladeshi pharmaceutical company, Globe Biotech. Since there are no effective vaccines, and pharmacological interventions now, so the only solution is the maintenance of social distancing in order to mitigate the impact on healthcare systems, and allow time for a public health response around the world.11 However, the present study was undertaken to detect the global as well as local prevalence, and death rate of COVID-19. A developed questionnaire was also used to investigate 500 people of Khulna division in order to find out the percentages of people who were mask user, associated with different risk groups, harmed by socio-economic impacts of COVID-19, involved with belief on government taking measures for controlling the spread of COVID-19.

METHODS

The present study was conducted during the period of December 29, 2019 to October 20, 2020. Some of the highly risk countries of the world including Asian, and South Asian regions were selected for recording the data on prevalence, and death rate of COVID-19. Collection of

data on prevalence of COVID from all of the divisions of Bangladesh was also done. The collection of all of these data was done by using some reliable web-based links.¹²⁻¹⁴ A developed questionnaire was also used to collect data from 500 people of Khulna division of Bangladesh.

RESULTS

During December 29, 2019 to October 20, 2020, the global prevalence of COVID-19 we recorded as 40,648,536 confirmed cases, and 1,122,992 deaths. In Bangladesh, we recorded 390,206 confirmed COVID-19 cases, and 5,681 deaths during the period March 8, 2020 to October 20, 2020. We recorded USA at the highest position in terms of testing, recoding of cases, and deaths (Table 1). As of October 20, 2020, USA reported 8,456,653 confirmed cases, and 225,222 deaths by conducting 127,057,107 tests during the period of December 29, 2019 to October 20, 2020. We found India at the second position in terms of tests, and confirmed cases which reported 95,083,976 tests, 7,594,736 confirmed cases, and 115,236 deaths (Table 1) from the beginning of COVID-19 to October 20, 2020. Brazil reported 17,900,000 tests, 5,251,127 confirmed cases, and 154,226 deaths (Table 1) due to COVID-19 pandemic. Among European countries, we recorded Russia at the fist position which reported 54,300,208 tests and 1,415,316 confirmed cases (Table 1). Among European countries, we recorded highest mortality in UK which reported 43,726 deaths due to COVID-19 pandemic. We found Bangladesh at the 17th position in terms of confirmed cases which reported 2,178,714 tests, 390,206 confirmed cases, and 5,681 deaths due to COVID-19 pandemic (Table 1). Among Asian countries we recorded India at the 1st position in terms of confirmed cases and deaths (Table 1). Iran, Iraq, Bangladesh, and Indonesia were secured 2nd, 3rd, 4th, and 5th position during our study among Asian countries (Table 1). Among South Asian countries, we recorded India at the 1st position in terms of confirmed cases, and deaths (Table 1). Pakistan reported second highest deaths due to COVID-19 (Table 1). Bhutan reported no deaths and lowest confirmed cases (Table 1) among South Asian countries. Sri Lanka reported 1st lowest deaths due to COVID-19 (Table 1) during our study. In case of division wise prevalence of COVID-19 in Bangladesh we recorded Dhaka at the 1st position which reported 151423 confirmed cases (Table 2). Chittagong, Khulna, Rajshahi, Sylhet, Rangpur, Barisal, and Mymensingh were recorded as the 2nd, 3rd, 4th, 5th, 6th, 7th, and 8th position holders respectively in terms of division wise prevalence of COVID-19 in Bangladesh (Table 2). Mexico reported highest death rate 10.10%, Italy reported second most death rate 8.64% (Table 3) due to COVID-19 pandemic. Among Asian countries we recorded highest death rate in Iran then in Iraq (Table 3) due to COVID-19. Bangladesh reported 1.46% death rate (Table 3) due to COVID-19 pandemic. By using a developed questionnaire, we found only 8% people of Khulna district as mask users (Table 4) while in Satkhira, Jessore, Chuadanga, Narail, Bagerhat, Magura,

Jhenaidah, Kushtia, and Meherpur mask users were observed as 12%, 9%, 10%, 11%, 13%, 14%, 10%, 10%, and 13% respectively (Table 4). Questionnaire was also used to find out percentages of people who were carriers of the risk factors of COVID-19, socio-economic impacts of COVID-19, percentages of respondents who were believers at different levels on government taking measures for controlling COVID-19 in Khulna division, Bangladesh. We selected hypertension, diabetes, respiratory illness (cough), and smoking as the risk factors of COVID-19, and among 500 respondents of ten districts of the Khulna division, we found 12% of respondents as hypertension carriers in Chuadanga (Table 4) that was highest among ten districts of Khulna division. We observed 11% of respondents as diabetes carriers in Khulna district (Table 4) as the highest percentage among all the districts of Khulna division. 11% of respondents found from Meherpur district of Khulna division as respiratory illness (cough) carrier (Table 4). We observed 37% of respondents as smoker in Kushtia district of the Khulna division (Table 4). When we tried to find out the social impacts of COVID-19, we found 37% of respondents as high level of stress carriers in Narail (Table 4). We found 28% of respondents as high level of stress carrier in Satkhira (Table 4) which was the lowest percentage among ten districts of the Khulna division. Bagerhat reported 37% of respondents as carriers of high level of loneliness (Table 4). We found lowest percentage of respondents as high level of loneliness carriers in Khulna which was 27% (Table 4). We observed some people were involved in loud arguments or fights with other family members. In that case, Khulna and Kushtia reported 35%, and 24% of respondents respectively (Table 4) which were highest, and lowest percentages among all districts of the Khulna division. Due to long-term lockdown during COVID-19 pandemic, some people were badly engaged themselves with excessive use of social networking sites, and we found 39% of respondents in Satkhira (Table 4), and 28% of respondents in Meherpur (Table 4). Ongoing COVID-19 pandemic has created unbearable economic impacts in the world especially in the lower income countries. People of Bangladesh are also sufferers of these economic impacts of COVID-19. During our study, we found 35%, and 21% of respondents who lost their jobs in Khulna and Magura district (Table 4). 33%, and 20% of respondents we observed who lost their savings in Meherpur, and Magura respectively (Table 4). 32%, and 25% of respondents we found whose businesses were in danger of bankruptcy in Kushtia, and Narail respectively (Table 4). We found some people who were not able to buy food in Khulna division. In that case, 32%, and 20% of respondents we observed in Satkhira and Magura respectively (Table 4). In case of belief in government taking measures to control the spread of COVID-19, we found 20% people had no faith but they suggested that government should be strict (Figure 1). We observed 35% people as true believers of government taking measures, 22% people as believers but they claimed those measures as too strict (Figure 1), 11% people as non-responders (Figure 1), and 12% people as ignorants (Figure 1) about these issues.

Table 1: Number of total cases and total deaths related to COVID-19 in some selected countries, and some Asian and South Asian countries.

Name of countries	Total cases	Total deaths					
In some selected countries							
USA	8,456,653	225,222					
India	7,594,736	115,236					
Brazil	5,251,127	154,226					
Russia	1,415,316	24,366					
Spain	1,015,795	33,992					
Argentina	1,002,662	26,716					
Colombia	965,883	29,102					
France	910,277	33,623					
Peru	870,876	33,820					
Mexico	854,926	86,338					
UK	741,212	43,726					
South Africa	705,254	18,492					
Iran	534,631	30,712					
Chile	493,305	13,676					
Iraq	430,678	10,317					
Italy	423,578	36,616					
Bangladesh	390,206	5,681					
In the Asian countrie	es						
India	7,597,063	115,236					
Iran	534,631	30,712					
Iraq	430,678	10,317					
Bangladesh	390,206	5,681					
Indonesia	365,240	12,617					
In the South Asian co	ountries						
India	7,597,063	115,236					
Bangladesh	390,206	5,681					
Pakistan	323,452	6,659					
Nepal	136,036	757					
Bhutan	330	0					
Maldives	11,232	37					
Afghanistan	40,287	1,497					
Sri Lanka	5,625	13					

Source: https://www.worldometers.info/coronavirus/.12

Table 2: Number of division wise confirmed cases in Bangladesh.

Name of the divisions	Number of confirmed cases
Dhaka	151423
Chittagong	48498
Khulna	22140
Rajshahi	20451
Sylhet	12995
Rangpur	12308
Barisal	8561
Mymensingh	6559

Source:

http://dashboard.dghs.gov.bd/webportal/pages/covid19.php.13

Table 3: Death rate of COVID-19 in different countries.

Name of the countries	Death rate (%)
Mexico	10.10
Italy	8.64
UK	5.91
Iran	5.74
Peru	3.89
France	3.72
Spain	3.49
Colombia	3.01
Brazil	2.94
Chile	2.77
USA	2.69
Argentina	2.66
South Africa	2.62
Iraq	2.40
Russia	1.72
India	1.52
Bangladesh	1.46

Source: https://www.statista.com/statistics/1105914/coronavirus-death-rates-worldwide/.14

Table 4: Percentages of people who were mask users, associated with risk groups, harmed by socio-economic impacts of COVID-19 in Khulna division of Bangladesh, (n=500).

Factors	Khulna	Satkhira	Jessore	Chuadanga	Narail	Bagerhat	Magura	Jhenaidah	Kushtia	Meherpur
Mask user (%)	8	12	9	10	11	13	14	10	10	13
Risk groups (%)										
Hypertension	10	8	7	12	9	11	8	6	8	10
Diabetes	11	9	8	10	9	10	8	9	7	10
Respiratory illness (cough)	9	8	5	9	7	8	10	9	7	11
Smoking	30	31	33	29	27	30	32	36	37	35
Social impacts										
High level of stress	30	28	33	36	37	31	29	33	35	30
High level of loneliness	27	30	29	32	35	37	33	31	36	28
Loud arguments/fights with other member	35	30	29	31	27	25	31	30	24	28
Excessive use of social networking sites	37	39	31	40	29	36	35	38	30	28
Economic impacts	3									
Loss of job	35	32	30	33	31	29	21	27	29	31
Loss of savings	30	32	28	30	29	27	20	31	29	33
Business is in danger of bankruptcy	31	29	27	30	25	29	26	30	32	28
Inability to buy food	30	32	30	31	28	28	20	27	29	31

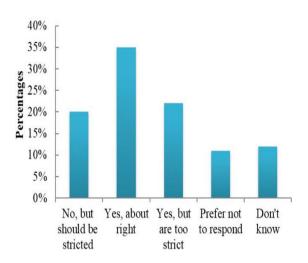


Figure 1: Percentages of people who belief on government taking measures for controlling the spread of COVID-19, (n=500).

DISCUSSION

Outbreak of COVID-19 has been proving to be an unprecedented catastrophe, especially in the mostly affected countries like USA, India, Brazil, Russia, Spain, Italy, China, UK, Iran. This ongoing pandemic has left all sectors like health, economic, and social in a state of disarray. It is an emerging global health concern that has already crossed the borders of a total of 215 countries, areas or territories around the world and 2 international conveyances. The Government of USA failed to prepare for this ongoing pandemic at the right time, and ignored urgent warning signs. He continued to make light of the high risks, saying repeatedly that everything was under control. The USA government also repeatedly fails to utilize public health experts in the leading stage. 15 For that reasons, we recorded USA at the highest position in terms of testing, recoding of cases, and deaths due to COVID-19.¹² India has already exceeded Brazil in terms of confirmed cases, as SARS-CoV-2 continues to spread through the country at the fastest rate of anywhere in the world. However, while COVID-19 cases in the USA have begun to reach an equilibrium state, the rate of infection in India is aggravating by the day, and may be India will soon become the topmost affected country in the world. 16 We recorded India and Brazil at the 2nd and 3rd position respectively in terms of confirmed cases. ¹² Among European countries, we recorded highest mortality in UK then in Italy, and Spain respectively which showed more or less similar results with the findings of earlier publications. 12,17,18 In India, the increase in reported cases is due to increase in number of testing. But while the infection is rising, India is opening workplaces, public transport, eateries, gyms in order to repair her lagging economy. Moreover, preventive measures like wearing masks and keeping social distancing are not in such a way that should be. Moreover, strict lockdown forced people to stay at home, and provoked millions of workers who

lost their jobs in the cities to return home on foot, buses and trains. By that means, COVID-19 had spread throughout the country.¹⁹ For those reasons, India was recorded as the topmost affected country among Asian countries.¹² Among South Asian countries, India implemented national lockdown within a short time period while Bangladesh, Nepal, Pakistan and Sri Lanka implemented lockdowns by giving their people longer notice to prepare. But, health expenditure of India as a proportion of total government expenditures is the lowest of these five nations. Moreover, the government of India provided so little in terms of compensation for those who had lost their income sources and also for social protection.²⁰ For those reasons, India occupied the 1st position in terms of confirmed cases and total deaths among South Asian countries. 12 Occurrence of COVID-19 in a region varies due to some reasons like easy access to the foreigners who come from the affected countries, size of population, maintenance of social distancing, wearing of mask and so on. Among all the divisions of Bangladesh, we recorded Dhaka at the 1st position in terms of confirmed cases due to the reasons mentioned earlier.¹³ In that case, we recorded Chittagong, Khulna, Rajshahi, Sylhet, Rangpur, Barisal, and Mymensingh as the occupiers of 2nd, 3rd, 4th, 5th, 6th, 7th, and 8th position respectively.¹³ Death rate of COVID-19 among countries varies due to so many reasons like the availability of testing facilities, healthcare system, type of case definition, demography, rapid and robust preparedness, and response strategies. For these reasons, death rate was low in Asian countries compared to European and American countries. We recorded highest death rate in Mexico. ¹⁴ Among Asian countries, highest death rate was recorded as 5.74% in Iran while India reported 1.52% death rate .14 In Bangladesh, we recorded 1.46% death rate which showed more or less similar results with the findings of previous research work. 14,21 Wearing mask can significantly reduce the chance of being infected with SARS and influenza-like diseases according to previous research works but we found very few people of Khulna division were aware of this matter (Table 4) and for that reason, we observed Khulna division at 3rd position in terms of confirmed cases in Bangladesh.^{22,23} There are so many risk factors for being affected by COVID-19 and hypertension is one of these factors. Previous researchers also reported hypertension as one of the risk factors of COVID-19, and we found significant percentages of people as hypertension carrier in Khulna division (Table 4).^{24,25} Now-a-days diabetes is very common problem, and it acts as one of the risk factors of COVID-19 that was reported by previous researchers, and we found notable percentages of people as diabetics in Khulna division (Table 4).^{24,25} Respiratory illness (cough) acts as a major risk factor of COVID-19 that was documented by previous studies, and we observed significant percentages of people as the carriers of it in Khulna division (Table 4).^{26,27} During this ongoing pandemic, most of the smokers are in vulnerable situation, and previous research work also documented smoking as a significant risk factor of COVID-19.28 We observed many more people

as smoker whose percentages were higher than expectation in Khulna division (Table 4). COVID-19 is not only taking away lives but also is creating socioeconomic impacts on human being. The people of middle- and lowest-income countries are the major sufferers of these socio-economic impacts. Due to this ongoing pandemic, many people of our country are going through stressed condition. Previous researchers reported high level of stress as one of the social impacts of COVID-19, and we found significant percentages of people as a carrier of high level of stress in Khulna division (Table 4).²⁹ Long term lockdown during ongoing pandemic has created loneliness among people of our country. Previous research works claimed loneliness as a public health issue especially for older adults with harmful impact on physical, and mental health, and we found significant percentages of people with high level of loneliness in Khulna division (Table 4). 30,31 Earlier study reported that unavoidable surge of the economic strain with the increase of uncertainty had put families under pressure, and their relationships into a real test.³² As a result, family members got engaged themselves with loud arguments or fights with other members, and we found major percentages of people occupied in loud arguments or fights with other members in Khulna division (Table 4). Social media is as an effective source for obtaining health information but it can be used as a means of disseminating misinformation, and its excessive use is responsible for harmful effects on health. Previous researchers claimed that ICT use improvement in older populations may act as an effective technique to counteract social isolation and loneliness during this ongoing pandemic, and we found significant percentages of people as excessive users of social networking sites in Khulna division (Table 4).30 During this ongoing pandemic, many people has got fired from their jobs which has created difficult conditions for running their families. Previous study claimed loss of job as one of the economic impacts of COVID-19, and we observed notable percentages of people as the loser of jobs in Khulna division (Table 4).33 Many people are going through loss of their savings during this ongoing COVID-19 pandemic. Previous researchers documented financial loss as one of the economic impacts of COVID-19, and we found considerable percentages of people who lost their savings due to COVID-19 outbreak in Khulna division (Table 4).34 Many businessmen who are involved with small and medium businesses have gone bankrupt during this ongoing pandemic that may be defined as one of the economic impacts of COVID-19. Earlier study claimed small, and medium business as in danger of bankruptcy due to COVID-19 outbreak, and we observed major percentages of people as the sufferers of that condition in Khulna division (Table 4).7 Many people have become unable to buy foods for their family members due to loss of jobs and savings during this pandemic condition. Earlier findings documented inability to buy food as one of the economic impacts of COVID-19, and we found significant percentages of people who were unable to buy food due to COVID-19 pandemic in Khulna division (Table 4).³³ The Government of Bangladesh has taken controlling measures against COVID-19 like many other world leaders. During our study, we found most of the respondents as the supporters (Figure 1) and some of them as perfidies (Figure 1) of her strategy. We also found some people who were not interested to response (Figure 1), and some of them as ignorant (Figure 1) of that issue. The position of the respondents revealed that the controlling measures should be strict which showed more or less similar results with the findings of previous study.³⁵

CONCLUSION

The present research work was conducted to find out the global as well as local prevalence and death rate of COVID-19. By using a developed questionnaire, we also investigated 500 people of Khulna division and tried to find out the percentages of people of different categories like using of mask, involving in different risk groups, significant increasing of different kinds of family crises also known as social impacts, afflicting with economic impacts, believing the government taking measures to control the spread of COVID-19. As of October 20, 2020, more than 40 million people worldwide had been infected with SARS-CoV-2. Fight against COVID-19 is not so easy because of its unknown origin and strange biological features. To control the COVID-19 pandemic, the techniques like hand sanitization, wearing mask, isolation, quarantine, social distancing and community confinement should be adopted strictly. The government of Bangladesh should take necessary steps to mitigate social and economic problems. As the COVID-19 pandemic is still ongoing with its rapid transmissible nature, all the countries should increase their attention into disease surveillance systems with quick readiness for addressing such kind of pandemic. WHO can play a vital role by taking immediate measures to prevent the outbreak of such kind of emerging pathogens across the globe.

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