

Global Pandemicity of COVID-19: Situation Report as of June 9, 2020

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ABSTRACT: A novel coronavirus was identified as the cause of a cluster of pneumonia cases in Wuhan, China in December 2019. This cluster quickly spread across the globe and led the World Health Organization (WHO) to declare severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) a pandemic on March 11, 2020. Its sudden emergence, ceaseless human-to-human transmission, and rapid spread has led to continuous pandemicity. As of June 9, 2020, there were 7039918 confirmed cases and 404396 deaths globally. The rate of spread of COVID-19 is affected through respiratory droplets, most commonly when infected individuals cough or talk. The virus is released through respiratory secretions that infect individuals once contact with mucous membranes is made directly or indirectly. Our research was conducted via an electronic literature review on PubMed, Google Scholar, and MedLine Plus. Data were then collected from peer-reviewed articles that included applicable keywords and published between January 1, 2020, and June 9, 2020. This article highlights the rapid spread of SARS-CoV-2 worldwide and indicates a higher number of mortalities in the elderly and those with comorbidities. As the number of cases increases, an immediate need to “flatten the curve” is essential to avoid catastrophic overwhelming of hospital systems across the affected countries. To do so, there is an emphasis on detection, testing, isolating the infected, and organizing the healthcare response to the virus. The rapid spread of infection has impacted over 200 countries and territories to date. This report takes a closer look at the cases, fatalities, and recoveries in different regions of the world with details regarding the geographic scale of SARS-CoV-2 spread, risks, and the subsequent impact on the countries affected. Also, this report discusses some effective measures that were carried out by some countries that helped them to mitigate the pandemic and flatten the curve of COVID-19 spread as early as possible.

KEYWORDS: Coronavirus, COVID-19, SARS-CoV-2, global outbreak, pandemic

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Introduction

What began as an emerging pneumonia-like illness in Wuhan, China in December 2019 has now been declared as a global pandemic by the World Health Organization (WHO) on March 11, 2020.¹ The Chinese Center for Disease Control and Prevention (CDC) ruled out related coronaviruses such as influenza, avian influenza, adenovirus, severe acute respiratory syndrome coronavirus (SARS-CoV-1), and Middle East respiratory syndrome coronavirus (MERS-CoV) as possible causes for the respiratory syndrome, but eventually declared it as a novel coronavirus, giving it the name COVID-19.² Wuhan, South China Seafood Market was noted to be the epicenter of COVID-19.² Though the actual route of transmission is uncertain at this point, it is speculated to be a zoonotic disease transmitted to humans; however, the prevalence of human-to-human transmission has led to the pandemicity.³

Nationwide diagnostics of 4021 patients in China performed by January 26, 2020, revealed that patients between the ages of 30 to 65-years accounted for 71.45% of the confirmed cases, while pediatric patients less than 10-years old accounted for 0.35%.⁴ The elderly population, particularly those without

immunization, as well as front-line workers and their respective families are believed to be among the high-risk group.⁴ Also, patients with underlying diseases such as asthma, diabetics, and heart disease are most susceptible to COVID-19.⁴

Since the first patient admission was reported on December 12, 2019, and the first death of a Chinese national in early January 2020, travel-related cases began emerging in Thailand, Japan, South Korea, France, and the United States of America (USA) by mid-January.³ By the end of January, the novel coronavirus had spread through the Western Pacific, South-East Asia, USA, Canada, Europe, and Eastern Mediterranean countries.⁵ This spread constituted a Public Health Emergency of International Concern (PHEIC). As of June 9, 2020, there were 7039918 confirmed cases with 404396 deaths and 3596972 that recovered, globally.^{6,7}

Respiratory droplets from coughing, sneezing, and talking; indirect contact by touching contaminated surfaces with hands leading to contact with oral and nasal cavities, eyes, and mucous membranes; fecal-oral transmission and aerosol transmission have been implicated as the causes of the spread of COVID-19, a virus with an incubation period between 2 and 14-days.⁴



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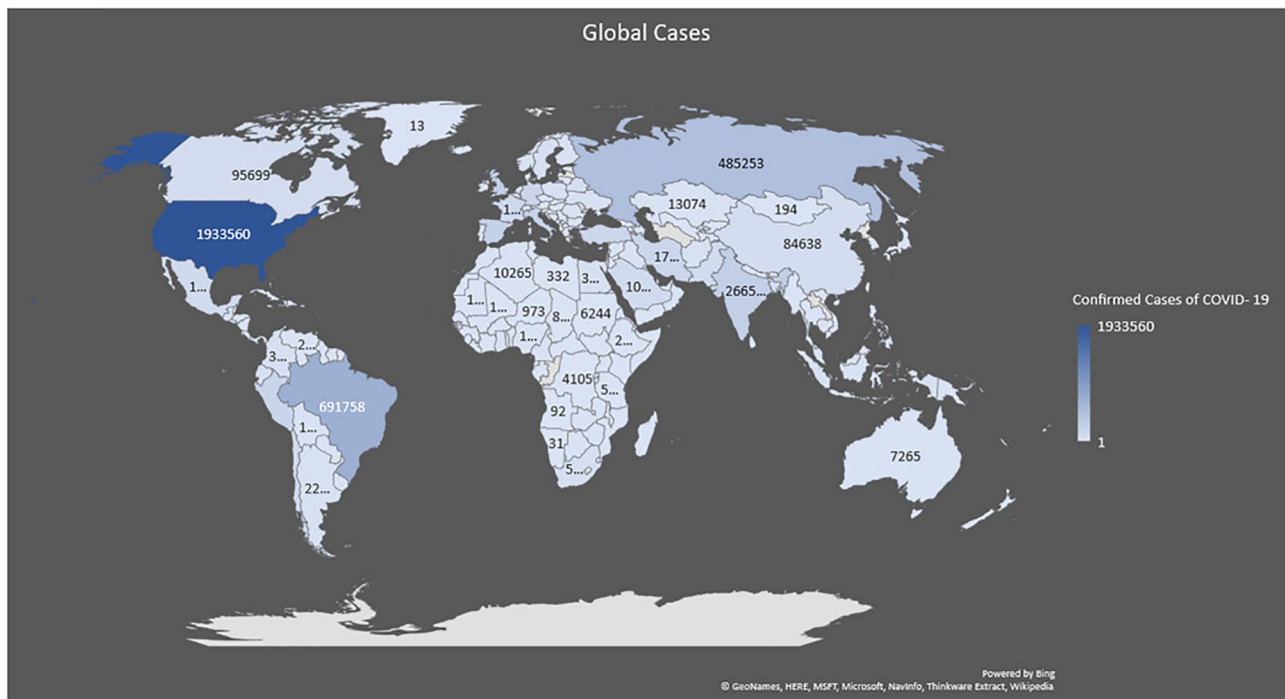


Figure 1. Global confirmed cases of COVID-19, as of June 9, 2020. The situation in numbers is obtained for cases by WHO.⁷

As clustered cases emerged earlier on, efforts to bring awareness to the general public by ending public gatherings, tracking and managing close contacts, and self-isolation to curb the transmission had failed;⁴ at which time, countries began establishing stricter monitoring and control measures for transportation facilities, workplace environments, and civil aviation.⁴ When these attempts proved inadequate, emergency shutdowns, and curfews worldwide were implemented as it was declared a pandemic in early March of 2020 due to escalating cases. Also, WHO has raised its global risk assessment for the new coronavirus to “very high,” as some countries struggle to contain the pathogen.⁷ The purpose of this article is to explore the geographic scale of COVID-19 spread, risks, and the subsequent impact on the countries affected, in addition to efforts made by different countries toward mitigating the spread and impact of the pandemic.

Methodology

An electronic literature review search was performed on PubMed, Google Scholar, and MedlinePlus.

The search was limited to peer-reviewed articles published from January 1, 2020, through June 9, 2020, for the compiled data. The articles were selected if they included keywords such as coronavirus, COVID-19, SARS-CoV-2, global outbreak, and pandemic. Articles were then reviewed and included based on the applicability to the topic.

Pattern of Spread

The world is currently experiencing an outbreak of the novel coronavirus, which started in Wuhan, China, and has rapidly

spread globally to impact 213 countries and territories as of June 9, 2020.^{1,6} On March 11, 2020, WHO announced that COVID-19 could now be characterized as a pandemic that needs to be stopped, as it rapidly spreads to parts of Asia and Europe, with cases and fatalities illustrated appropriately in Figures 1 and 2.⁷⁻⁹ To date, China is no longer the leading country with the most confirmed COVID-19 cases and deaths.¹⁰ China’s-WHO Joint Mission Team reported that the COVID-19 epidemic rapidly spread between January 10 and 12, 2020, but following rigorous containment and quarantine efforts, the number of new cases in China began peaking and plateaued by late-January 2020.^{9,10}

Many different factors determine the spread of this virus which should be addressed immediately to flatten the curve. Measures such as early detection, testing, isolating the infected persons, and mobilizing the healthcare response to the virus is crucial in this regard.⁸ Despite rigorous mitigation efforts (i.e., travel bans, quarantine, social distancing, isolation of infected populations, etc.), the growing prevalence and disease severity have overwhelmed even the most advanced countries and healthcare infrastructures.¹¹ Countries like Italy, the United Kingdom (UK), and the USA have experienced great strain on their healthcare system. This is partially due to limited health care professionals, critical care facilities with sparse mechanical ventilators, and the shortage of personal protective equipment (PPE), further jeopardizing public health outcomes.^{11,12} With little time to prepare, the pandemic is causing a major health crisis along with profound social and economic consequences across Asia, Europe, and North America.⁹ However, the current data may not represent the true disease burden of the

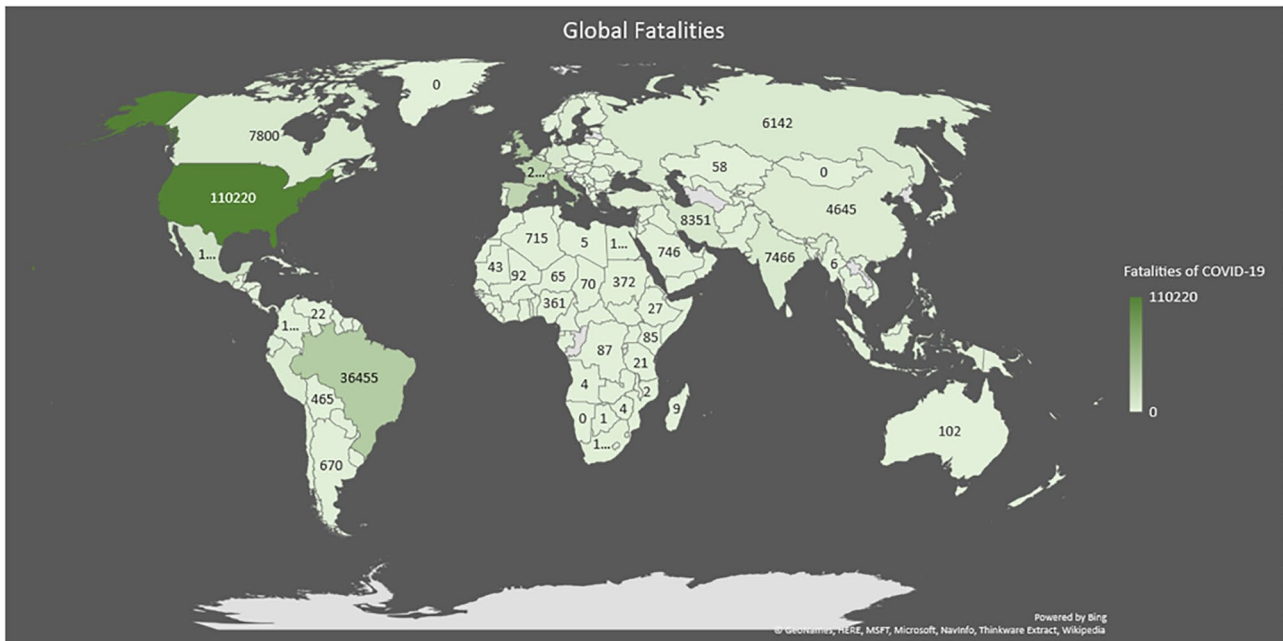


Figure 2. Global confirmed fatalities due to COVID-19, as of June 9, 2020. The situation in numbers is obtained for fatalities by WHO.⁷

ongoing COVID-19 pandemic in other parts of Asia, the Middle East, Africa, and Latin America, as many countries are limited by test availability, test processing rates, data collection, and reporting capabilities.^{9,13}

As of June 9, 2020, the USA is the North American country with the highest number of confirmed cases of COVID-19 which was 1,993,560, Mexico had 1,171,033 cases, and Canada had 95,699, as shown in Figure 1.⁷ In South America, the WHO reported total confirmed cases in Brazil as 691,758, Peru had 196,515 cases, and Chile had 138,846 cases.⁷ The most affected countries in the African region were South Africa with 50,879 cases, Nigeria with 12,801 cases, and Algeria with 10,265 cases.⁷ In Europe, the Russian Federation had 485,253 confirmed cases, the UK 287,403 cases, and Spain had 241,717 cases. China is still the Western Pacific country with the most confirmed cases of COVID-19 which was 84,638. India had 266,598 total confirmed cases, whereas Bangladesh (68,504) and Indonesia (32,033) of South-East Asia had fewer reported cases.⁷ Australia reported 72,655 confirmed cases, followed by New Zealand which had 11,540, and Guam 171 cases⁷ (Figure 1).

As of June 9, 2020, the USA had the highest number of fatalities from COVID-19 in North America, which was 110,220 deaths, followed by Mexico with 13,699 and Canada with 7,800, as seen in Figure 2.⁷ In South America, Brazil had the highest number of fatalities which were 36,455 deaths, Peru had 5,465 deaths, and Chile with 2,264.⁷ South Africa had the highest number of fatalities which were 1,080 deaths, followed by Algeria with 715, and Nigeria with 361 in the continent of Africa.⁷ In Europe, the countries with very high recorded fatalities were the UK with 40,597 deaths, Italy with 33,964 deaths, and France with 29,149 deaths.⁷ In Asia, Iran had the highest

number of fatalities which was 59,577, followed by China with 46,433, and India with 10,740 deaths. Australia had the highest number of fatalities in their Oceania region which was 102, followed by New Zealand with 22 deaths, and Guam with 5 fatalities⁷ (Figure 2).

Table 1 highlights the confirmed cases and fatalities surrounding COVID-19 by depicting the top 5 affected countries, as well as the 5 least affected countries in each region categorized by WHO, as of June 9, 2020.

North and Central America

USA. Different parts of the USA are seeing varying levels of COVID-19 activity, which are dependent on many factors, such as the duration and severity of the pandemic phase, recent travels, and public health responses.¹ As of June 9, 2020, there have been 1,933,560 reported cases with 110,220 deaths and 788,062 recoveries from COVID-19 within the USA.^{6,7} In the USA, 802 cases were reported on March 13, 2020, one of the highest numbers of new cases reported in a single day.¹ New York State, as of June 8, 2020, has the highest number of cases reported in the USA, which was over 379,000.¹⁴ Over half of these cases in New York State are from one of the busiest cities in the world, New York City.¹⁴ Washington State reported 24,354 cases with a total of 1,176 deaths, as of June 9, 2020.¹⁵ Of those cases in Washington, individuals between the age ranges of 40 to 59-years constituted the group with the highest number of confirmed cases. Furthermore, 34% of cases were seen in individuals over the age of 80 with a 53% case fatality rate.¹⁵ California was in a state of emergency, with 133,489 positive cases and 4,697 deaths, as of June 9, 2020.¹⁶

Table 1. Confirmed cases and fatalities of COVID-19 in most and least affected countries per region.

	TOTAL NUMBER OF CONFIRMED CASES	TOTAL DEATHS
REGION: AFRICA		
Most affected countries		
South Africa	50879	1080
Nigeria	12801	361
Algeria	10265	715
Ghana	9910	48
Cameroon	8060	215
Least affected countries		
Lesotho	4	0
Seychelles	11	0
Gambia	28	1
Namibia	31	0
Eritrea	41	0
REGION: AMERICAS		
Most affected countries		
USA	1 933 560	110 220
Brazil	691 758	36 455
Peru	196 515	5 465
Chile	138 846	2 264
Mexico	117 103	13 699
Least affected countries		
Saint Kitts and Nevis	15	0
Dominica	16	0
Saint Lucia	19	0
Belize	19	2
Grenada	23	0
REGION: EASTERN MEDITERRANEAN		
Most affected countries		
Iran	173 832	8 351
Saudi Arabia	105 283	746
Pakistan	108 317	2 172
Qatar	70 158	57
United Arab Emirates	39 376	281
Least affected countries		
Syrian Arab Republic	144	6
Libya	332	5

(Continued)

Table 1. (Continued)

	TOTAL NUMBER OF CONFIRMED CASES	TOTAL DEATHS
REGION: EASTERN MEDITERRANEAN		
Yemen	500	113
Jordan	831	9
Tunisia	1087	49
REGION: EUROPE		
Most affected countries		
Russia	485 253	61 42
UK	287 403	40 597
Spain	241 717	27 136
Italy	235 278	33 964
Germany	184 543	8 711
Least affected countries		
Holy See	12	0
Liechtenstein	83	1
Monaco	99	1
Montenegro	324	9
Malta	630	9
REGION: SOUTH EAST ASIA		
Most affected countries		
India	266 598	7 466
Bangladesh	68 504	930
Indonesia	32 033	1 883
Thailand	3 121	58
Nepal	3 762	14
Least affected countries		
Timor-Leste	24	0
Bhutan	59	0
Myanmar	244	6
Sri Lanka	1 857	11
Maldives	1 916	8
REGION: WESTERN PACIFIC		
Most affected countries		
China	84 638	4 645
Singapore	38 296	25
Philippines	22 474	1 011
Japan	17 210	916
Republic of Korea	11 852	274

(Continued)

Table 1. (Continued)

	TOTAL NUMBER OF CONFIRMED CASES	TOTAL DEATHS
REGION: WESTERN PACIFIC		
Least affected countries		
Papua New Guinea	8	0
Fiji	18	0
Lao People's Democratic Republic	19	0
Cambodia	126	0
Brunei Darussalam	141	2

Source: Data sourced from WHO situation report 141 through June 9, 2020.⁷

Canada. As of June 9, 2020, there have been roughly 95 699 reported cases, 7800 deaths, and 55 572 discharged cases related to COVID-19 in Canada.^{6,7} The highest number of cases were seen in highly populated provinces, such as Quebec with 53 185 confirmed (5029 deaths) and Ontario with 31 090 confirmed (2464 deaths), as of June 9, 2020.¹⁷ There was an increased risk of more severe outcomes for Canadians who are aged 65 and over with compromised immune systems or with underlying medical conditions.¹⁷

Mexico. In Mexico, there have been a total of 117 103 cases, 13 699 deaths, and 90 748 recovered, as of June 9, 2020.^{6,7} The cases of COVID-19 in Mexico were predominately through community-based transmission, according to the United States embassy in Mexico.^{7,18} As stated by WHO, the new confirmed cases in a single day as of June 9, 2020, were 3484 and the new deaths were 188.⁷

Central America. In Central America, Panama has the highest number of confirmed cases with 16 425 cases (393 deaths), Honduras had 6327 cases (258 deaths), and Costa Rica had 1318 cases (10 deaths), as of June 9, 2020.^{6,7} On March 10, 2020, Panama became the second country in Latin America and the first Central American country to have a confirmed coronavirus-related death.¹⁹ A 40-year-old Panamanian woman who had traveled to Spain became Panama's first confirmed case of COVID-19, in early March of 2020.¹⁹ On March 11, 2020, Honduras reported its first 2 cases of COVID-19 involving 2 women who had traveled to Europe: a 42-year-old who arrived from Spain and a 37-year-old who returned from Switzerland.¹⁹

Caribbean Islands. The Caribbean Public Health Authority (CARPHA) stated that as of June 8, 2020, there were 33 157 cases and 937 deaths related to COVID-19 in 33 countries and territories in the Caribbean region.²⁰ On March 21, 2020, 48 new cases were reported in the Caribbean region amongst people over the age of 50, making it one of the highest numbers of

reported cases in a single day in the Caribbean.²⁰ It is estimated that 40% of the cases were imported into the Caribbean by travelers and 36% were caused by close contacts, according to CARPHA.²⁰ As of June 9, 2020, the Dominican Republic had roughly 20 000 confirmed cases followed by Cuba with roughly 2200 cases.^{6,7} The Dominican Republic had its first confirmed case of COVID-19, reported on March 1, 2020, involving a 62-year-old Italian tourist.¹⁹ Furthermore, the Dominican Republic reported its first death from the virus on March 16, 2020, which involved a 47-year-old human immunodeficiency virus (HIV) positive woman, who also had tuberculosis (TB) and had traveled to Spain, recently.¹⁹

South America

In total, there were more than 1 219 723 cases of COVID-19 in South America that have been reported, as of June 9, 2020.^{6,21} As of June 9, 2020, the WHO reported the total confirmed cases in Brazil as 691 758 cases, Peru had 196 515 cases, and Chile had 138 846 cases, as shown in Figure 1.⁷ Dr. Carissa F. Etienne, the Director of Pan American Health Organization (PAHO), states that there were 3 main scenarios by which COVID-19 was introduced into the Americas: importation, community transmission, and outbreaks in enclosed areas such as nursing homes.²² It is important to note that the transmission of COVID-19 in the majority of the countries in South America was via local transmission, except for Curacao and Suriname where transmission was believed to have occurred via sporadic cases.⁷ Brazil is seen to have the highest number of fatalities which were 18 912 deaths, followed by Peru 4757 and Chile which had 4696 deaths, as seen in Figure 2.⁷

Africa

The outbreak of COVID-19 in the WHO African region has rapidly progressed over the past several weeks with large areas affected, as shown in Figure 1. The WHO situation report of June 9, 2020, showed a cumulative total of 140 498 reported cases and 3352 deaths related to COVID-19 across 47 countries and territories in the African region.⁷ The most affected countries in the WHO African region were South Africa (50 879 cases), Nigeria (12 801 cases), Algeria (10 265 cases), Ghana (9 910 cases), and Cameroon (8 060 cases).⁷ It is estimated that the majority of cases have arisen from community transmission or clusters of cases, although a few African countries show sporadic cases (ie, Uganda, Rwanda, Zimbabwe, Eritrea, Namibia, Gambia, and Lesotho).⁷ South Africa is seen to have the highest number of fatalities which was 1080, followed by Algeria which had 715 deaths, and Nigeria with 361, as shown in Figure 2.⁷ This recent upsurge in cases and deaths, over the past weeks, is concerning as many low-income African countries have extremely vulnerable populations that have a very high prevalence of HIV, malnutrition, and various chronic illnesses. According to WHO, African governments will need

to strictly adhere to mitigation methods to reduce the spread of the virus and in doing so, prevent further straining/stretching of an already fragile health system.²³

Europe

The spread of COVID-19 has been significantly higher in the WHO European region than in any other region of the world, as shown in Figure 1. As of June 9, 2020, there have been a cumulative total of 2 303 361 confirmed cases and 184 671 total deaths related to COVID-19 across 60 countries and territories in the European region.^{7,24} Overnight, the European region has had a significant increase of 16 801 new confirmed cases and 551 new deaths, mostly acquired via community transmission or cluster of cases.⁷ The most affected countries in the WHO European region were the Russian Federation (485 253 cases), the UK (287 403 cases), Spain (241 717 cases), Italy (235 278 cases), and Germany (184 543 cases).⁷ Of all the reported cases in the European region, 11% resulted in death, which implies that 89% of infected persons recovered.²⁵ The WHO European region situation update for COVID-19 showed that 75% of the cumulative deaths were reported from the UK (40 597 fatalities), Italy (33 964 fatalities), France (29 149 fatalities), and Spain (27 136 fatalities), as shown in Figure 2.^{7,25} The fatality rate showed that 94% of all deaths were in persons aged 60-years and older.²⁵ The COVID-19 situation in Europe has strongly affected the health care system throughout the region with 17% of the reported infections involving healthcare workers.²⁵ Due to the dire situation, many member states have implemented strategies to focus most of their efforts on severe cases and conducting sentinel surveillance.²⁵

Asia

As of June 9, 2020, India (South-East Asia) was the country with the most confirmed cases of COVID-19 which was 266 598, followed by the Islamic Republic of Iran (Eastern Mediterranean) with 173 832, and China (Western Pacific) with 84 638 in the Asian region. A majority of these cases were classified as community transmission and clusters of cases, as shown in Figure 1.⁷ Iran had the highest deaths related to COVID-19 which was 8351, followed by India with 7466, and China with 4642 deaths. These countries experienced larger outbreaks of local transmission and/or are clustered in time, geographic location, and common exposures which lead to the fatalities, as shown in Figure 2.⁷

Oceania

Out of the 14 countries that fall under the region of Oceania, Australia has reported 7265 confirmed cases of COVID-19, as of June 9, 2020, followed by New Zealand which had 1154 cases, and Guam with 171 cases, as shown in Figure 1. Cases in

Australia, New Zealand, and Guam were due to a cluster of cases, whereas the 8 cases in Papua New Guinea were due to sporadic cases.⁷ Australia was seen to have the most fatalities which stood at 102, followed by New Zealand with 22, and Guam with 5 deaths, as seen in Figure 2.⁷

Discussion

The ideology of “slowing the spread” comes to mind when thinking about control of the spread of COVID-19 around the globe. The confirmed cases and deaths peak in countries with COVID-19 depending on population education and awareness, preventative measures, surveillance of the infected, and interventions taking place.²⁶ Although slowing the spread may result in an increased time to confirm case and death peak, the goal of this practice is to prevent hospital systems from being strained beyond their capacity, thus resulting in less mortality.²⁷

In Canada, it was found that with isolation practices, the peak would be delayed by 2 to 4-wk, and intensive care unit (ICU) admissions could be reduced up to 53.6%.²⁸ Also, Canada has been prompt at relocating its PPE between various facilities, depending on the need.²⁹ Other countries yet to see the peak would benefit substantially by implementing aggressive social distancing, self-isolation, closure of schools and other institutions, encouraging working from home, and/or placing hard limits on the size of crowds at events so that the burden on hospitals will be lessened resulting in increased capacity to treat and ultimately, decreased mortality.³⁰

Also, regions such as Sub-Saharan Africa have reported a significantly lower number of positive COVID-19 cases when compared to their northern hemisphere counterparts who have a much higher testing capacity.³¹ Furthermore, travel from China to the USA, as well as to various parts of Europe have caused the number of confirmed cases in each visiting country to be skewed.³¹ However, no country is more immune to the virus when compared to another.³¹ The common goal globally is to eradicate the virus. This can be achieved by observing those countries whose approaches have flattened the curve, learning from those whose infection rate has risen and avoiding their strategies, and by adopting ideas that are proven to be successful at slowing the rate of infection.³⁰ However, geographical location and the timing of spread may serve as a fundamental reason why some countries have been more or less devastated by the virus.²⁹

By rapidly scaling up mass testing of their population at a very early stage, countries like South Korea (11 719 cases and 273 deaths), Vietnam (329 cases and 0 deaths), and Taiwan (443 cases and 7 deaths), as of June 6, 2020, were able to see a fall in the infection rate.^{29,32,33} These 3 countries were taught to compensate for weakness in their health care systems based on their experience with the 2003 SARS-CoV-1 outbreak thus, enabling them to respond more effectively in flattening the curve.^{33,34}

Germany is another country that constructively flattened the curve. It is seen as the country with the region's fifth-highest number of confirmed cases (184543) with only 8711 deaths.^{7,33} This is largely due to the outstanding German health care system; in particular, the country's nursing professionals consist of 13 nurses per 1000 people, allowing them to focus on patient management and survival.^{33,35} Taiwan, Iceland, and Sweden being perhaps the most notable exceptions, did not shut down the whole country, but instead employed early case detection, established at-risk contacts, and quarantined the infected.³⁶ As of April 11, 2020, South Korea had flattened the curve without shutting down the country by implementing stricter protocols, including public awareness campaigns, personal hygiene practices such as hand-washing, and early detection of the virus by testing the general public.³⁷ Hong Kong, Singapore, and Japan also took similar measures by taking action immediately to manage the outbreak, readjusted surveillance systems to identify potential cases, and provided diagnostic tests and increased testing capacity which led to earlier recovery.³⁸ As of June 8, 2020, Finland is the most successful in flattening the curve and/or containing the rate of spread with an average 7-day decline of cases by -10.8%.³⁹

Conclusion

Since December 2019, the outbreak that started in the city of Wuhan, China has managed to spread to over 200 countries and territories and turned from an epidemic into a pandemic. The rate of transmission, methods of containment, number of individuals infected, and the death rates vary widely amongst different countries. The conclusion drawn from this research is that the virus spreads quickly, often through those who do not know that they are carriers, and seems to present more severely in those with advanced age and underlying health conditions. From this research and by the statistics from different areas of the world, it can be concluded that infection from the virus results in death in individuals who are 80-years old or older, with a case fatality rate reaching up to 50% of deaths among infected individuals in this age group.

The transmissibility of the virus also seems to be higher in densely populated areas. Given that the incubation period can be 2 to 14-days, and many younger and healthy infected individuals have mild or no symptoms, the metropolitan New York City, has seen substantially increased transmission of the virus despite mitigation measures that were in place. Countries and areas that have had aggressive containment measures, such as complete lockdowns and stay at home orders, have seen considerable decreases in rates of transmissibility. What is evident is that the mitigation efforts are slowing down the spread when acted upon aggressively, but there is still widespread transmission and death amongst individuals in countries where the SARS-CoV-2 infection has been reported, which is depicted graphically in the figures above. To slow the spread, and ultimately eradicate the SARS-CoV-2 virus, countries must work together to develop a vaccine or create an effective therapeutic intervention to prevent further increase in death and

transmission. Citizens of the affected countries should adhere to instructions from CDC, WHO, and their local administrators concerning social distancing, avoiding large gatherings, seeking testing when symptomatic, and wearing face masks, to forestall further spread of this virus.

Author Contributions

A.S.: Conceptualization, and design, approval of the final version, responsibility for the accuracy, and integrity of all aspects of research. C.O.: Supervision and revising the article for intellectual content; editing. Z.H.: Writing—review, and editing. R.P.: Writing—review, and editing. P.D.: Writing—review, and editing. S.P.: Writing—review, and editing. U.J.: Writing—review, and editing. J.M.: Writing—review, and editing. A.M.: Writing—review, and editing; project administration.

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