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Clinical Manifestation and Epidemiological Impacts of Pandemic Zoonotic Disease of the Novel Corona Virus (COVID-19)

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ABSTRACT

This study used to address the most organized information about clinical demonstration and epidemiological impacts and the new pandemic zoonotic disease called corona virus.

Background: The new respiratory virus known as corona (COVID-19) first originated in China at Wuhan, and rapidly spreading to all worldwide continents. The common cold, SARS, MERS and COVID-19 are types of corona viruses, and most people get infected with one or more of these viruses at some point in their lives. COVID-19 is viruses known for containing strains of lethal diseases in mammals and birds, its infections rate is doubling at every six days, infecting large number of people, its name is given from the protrude spikes surfaces, infect the respiratory tract of animals and human, transmit via droplets and contact.

Objectives: The objectives of this study is to address scientific information's about zoonotic disease called COVID-19, its clinical display like symptoms, ways of transmission, prevention methods, epidemiology and complications.

Methods: Observing what is happening in the world, and collecting epidemiological data from WHO about COVID-19, organizing and rewrite in scientific methods.

Results and Conclusion: Zoonotic diseases are diseases first transmit from infected animal to humans, animals such as bat, rat, pig, insects, fish, etc. The novel COVID-19 have been first originated in Wuhan from seafood sale market of sells fish, bats, snakes and pangolins and highly spreading globally. It is a pandemic zoonotic disease, infecting every individual of human being at any age, sex, race, religions, lifestyle, educational level, etc. Its similar symptoms with other corona viruses type such as strong fever, high elevated body temperature, dry cough, muscle fatigue, breathing difficulties, etc and also less common symptoms includes coughing mucus or blood, headaches, diarrhea, and kidney failure. In addition, as the disease progresses, patients approach with pneumonia, inflames the lungs and causes alveoli to fill with fluid and this can be detected by an X-ray. Its primary ways of transmission includes respiratory droplets from coughing and sneezing of fluid produced by infected individuals, touching contaminated surfaces, hands and objects with our hands then our mouth, nose and eye. Based on worldwide epidemiological data, more than 2.8 million people were infected, of which about 200,000 were died within 100 days, whereas, about 25 million people were infected, of which more than 846,000 were died within 220 days and also it creates negative economic impacts especially in developing countries. However, till now there is no recognized therapeutic against corona viruses, therefore advisable prevention methods are washing our hands regularly with soap, use hand sanitizer properly, during coughing and sneezing use inside of our elbow, stop handshaking with anyone, stay at home to limit social contacts and wear/use face mask and gloves and also stop eating uncooked animal products as recommended by world health organization (WHO).

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Introduction

According to definition of zoological sciences, zoonotic disease is a disease that first originated from animals and transmitted to human. Specifically, zoonoses is diseases transmitted from infected animals to humans by pathogens include viruses, bacteria, fungi, parasites, etc, with several means of transmission of diseases such as directly by the bite or scratch, handling of animal, ingestion of animal products, etc; indirectly by ingestion of contaminated food and water, inhalation of contaminated fluids, exposure to contaminated soil/water, etc; and insect vector-borne diseases infections include mosquito-borne, tick-borne, fleas, flies, lice, etc [25, 26] and cause a serious of disease and death. Basically, such host infected animals are like bat, pig, monkey, dog, cat, chickens, insects, etc and also some of zoonotic diseases such as, Common Cold, SARS, MERS and COVID-19. The corona viruses are a family of corona viridae viruses containing strains which cause death in mammals and birds. In humans being, the new corona viruses are typically spreading by direct contacts and airborne droplets of fluid with strains produced by infected individuals, including corona virus (COVID-19), severe acute respiratory syndrome (SARS) and Middle East Respiratory Syndrome

(MERS), can cause rapid death in humans being. Corona viruses are enveloped genome of ribonucleic acid (RNA) viruses with helical symmetry, it is the largest of all known RNA viruses and the name is given from the appearance of evocative of a crown shaped surface covering protein spikes of virus particles when viewed under electron microscopy. Historically, in the late 1960s, the first corona viruses of an infectious bronchitis in chickens and the two common cold (corona virus 229E and corona virus OC43) in human were discovered and the earliest members of this family of virus, including SARS-CoV in 2003, HCoV NL63 in 2004, HKU1 in 2005, MERS-CoV in 2012, and COVID-19 in 2019 and most of these viruses have been involved serious respiratory tract infections [1-5]. The corona viruses have been recognized since the early 1970s as causing pathological conditions in veterinary medicine and except for avian infectious bronchitis, the major related diseases have mainly an intestinal location [6]. According to the Editorial Board (2020) and world health organization (WHO) (2020), the novel strain of corona virus (named COVID-2019) outbreak was reported in December 31, 2019 in Wuhan, China and virual infection confirmed from suspected human being by laboratory testing (2020) [23, 24]. Some researchers report indicate that marketable seafood may not be the original source for the transmission of disease to humans and other researchers indicate that the new corona virus has 96% similarity to a bat corona virus, thus why its originate broadly suspected from bats [7, 8]. Therefore, knowing historical background is significant to create new solution for the novel type of diseases, which may be important for the current scientists to develop medicine or vaccine for novel corona virus (COVID-19).

The morphological structure of the novel corona virus contain spherical particles on the projections surface with the diameter about 120 nm and its envelope appears as a pair of distinct dense shells in electron microscope which consists of a lipid bilayer where the membrane, envelope and spike structural proteins are anchored. In addition, inside of the envelope, there is the nucleocapsid formed from multiple copies of the nucleocapsid protein as indicated in figure 1, which bound to the genome of single stranded RNA [9-13]. The genome size for corona viruses ranges from approximately 27 to 34 kilo bases [3] and the lipid bilayer envelope, membrane proteins, and nucleocapsid protect the virus when it is outside the host cell [14]. Therefore, this paper mainly focus on zoonotic disease that is affecting human being, characteristics of corona virus, its ways of transmission from infected animal to humans and human to human, its symptoms, risky people and economic impacts, its epidemiology and complications, and it's advisable prevention methods as recommended by WHO are included.

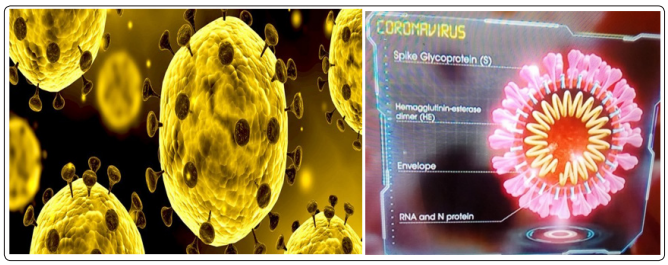

Figure 1: The Structure of the New Corona Virus (COVID-19) [23].

Corona Virus

The disease corona viruses are pandemic zoonotic, a group of related viruses, that cause diseases in mammals and birds. In humans, corona viruses cause respiratory tract infections that can be mild of the common cold and others can be lethal, such as SARS, MERS, and COVID-19. The symptoms is vary within different species, and no vaccines or antiviral drugs to prevent or treat human corona virus infections. According to World Health Organization (2020), the COVID-19 outbreak, has been declared a pandemic and the respiratory illness that never caused before and the corona virus has spreading across the world. However, WHO (2020) was first alerted as the disease and which is a family of corona viruses known as COVID-19, the same family with the diseases of SARS, MERS and common cold [15, 23]. Therefore, this article contain brief explanation about COVID-19, its clinical expression such as symptoms, transmission routes, prevention methods, epidemiology and complications.

Zoonotic Diseases

Zoonotic diseases are diseases that caused from an infected animal may first transmitted the virus to humans, those animals such as bat, rat, pig, monkey, tiger, dog, cat, fish, etc. According to experts explanation, an infected animal like bat, rat, pig, and fish may have first transmitted the virus to humans at a market, in China, Wuhan. In this case, the bats are considered a potential source of corona virus that have evolve to coexist with many viruses, they were found as starting point for SARS and bats transmit the virus to an intermediate host animal, like pangolins, which is consumed in China, and so the virus may have then passed to humans, then the virus outbreak grew of transmission from human-to-human. In addition, infected people with the virus produce tiny respiratory droplets can pass during talking, coughing or sneezing to the normal individual. Similarly, during coughing or sneezing most respiratory droplets drop to the ground within a few feet and so people who are in close contact with infected person, may grab the virus. According to WHO (2020), the infected people may pass on the novel corona virus even if they have few clear symptoms or not, when they are going to work place or to religious area, and then they may breath close to other people [16, 23].

The Symptoms of Corona Virus

Based on WHO (2020) and medical information on the symptoms of corona virus indicate that the new corona virus causes similar symptoms to those of previously identified disease-causing corona viruses. In currently identified patients symptoms from a wide analysis of the clinical features of the disease corona virus are fever, elevated body temperature, dry cough, fatigue or muscle pain, breathing difficulties and also less common symptoms includes coughing up mucus or blood, headaches, diarrhea, and kidney failure. As the disease progresses, patients also come down with pneumonia, which inflames the lungs and causes them to fill with fluid and this can be detected by an X-ray [16, 23]. Basically, the symptoms of COVID-19 is vary within species, such as, it causes an upper respiratory tract disease in chickens, diarrhea in cows and pigs, and also strong fever, high elevated body temperature, dry cough, breathing difficulties or shortness of breath and also the illness causes lung lesions and pneumonia, etc in human [15, 23]. But milder cases may resemble the flu or a bad cold, making detection difficult and the patients may exhibit other symptoms, too, such as gastrointestinal problems or diarrhea. Current estimates suggest that symptoms may appear in as few as two days or as long as 14 days after being exposed to the virus. In addition, if any individual have a fever or a cough, it is better to call first to the office to get visit and take steps to protect other patients, family members and staff from potential contact [16, 23].

Transmission Ways of the Novel Corona Virus

According to WHO (2020), there are various ways of transmission from infected person to normal individual such as direct contact with infected individuals, respiratory droplets of infected

individuals generated by coughing and sneezing can spread via airborne droplets of fluid and also touching contaminated surfaces and objects with our hands then to our mouth, nose and eye. According to WHO (2020) and health experts information, the new corona virus is infecting animal and first transmitted to humans at a market by sold live animals in China, Wuhan. That means, the novel corona virus (COVID-19) have been first originated in Wuhan from seafood sale market of sells fish, bats, snakes and pangolins and then spreading of corona virus is that the first potentially infections of animal-to-human being, and then confirmation that human-to-human transmission and as the virus is rapidly spreading, local transmission has been seen across all over the world [23]. Specially, the main transmission of zoonoses diseases pathogens include viruses, bacteria, fungi, parasites, etc, directly by the bite of animals, animal handling, ingestion of animal products, etc; indirectly by ingestion of contaminated food and water, contaminated fluids inhalation, exposure to contaminated soil/water, etc; and insect vector-borne infections include mosquito-borne, tick-borne, fleas, flies, lice, etc [25, 26]. Based on WHO (2020), the virus can move from person to person via respiratory droplet when a person sneezing or coughing freely because the virus can survive for periods in the air after being sneezed or coughed from an infected individual, direct contact with infected individuals and contact with contaminated surfaces and objects, hand shaking with infected individual and then touching our face specifically our mouth, nose and eye before washing our hands with soap. According to CDC report, (2020), the primary transmission of corona virus from human to human occur among close contacts via respiratory droplets generated by sneezing and coughing. The interaction of the corona virus spike protein with its complement host is central in determining the tissue tropism, infectivity, and species range of the virus and corona virus infect the cell of human being by attaching to the angiotensin of receptor enzyme [20-22]. Therefore, understanding the main transmission of the novel corona virus is important to implement it and prevent this pandemic zoonotic disease.

Prevention Methods of Corona Virus

According to WHO (2020) and health experts information on the prevention methods of the spreading of the pandemic zoonotic disease of the novel corona virus (COVID-19) are the following, such as washing our hands regularly with soap at least for about 20 minutes, coughing and sneezing on the inside of our elbow, use tissues paper, no handshaking with any individual, stay at home with symptoms of the common cold or flu and limit social contacts. Similarly, there are various measures used to prevent the spread of novel corona virus COVID-19, such as coughing and sneezing, the virus transmits from infected person to normal person through their nose, mouth, throat or lungs and the virus gets into the air through small droplets while the normal individual inhale these droplets or transfer them via their hands in their mouth, nose or eyes and they become infected with the virus. Therefore, WHO (2020) recommends a range of prevention measures to protect ourselves from contracting the disease, based on good hand hygiene and respiratory hygiene in much the same way to reduce the risk of contracting the flu. The novel corona virus does rapidly spreading and infecting human being somewhat different from flu, because it mainly affects the respiratory tract, but the protection measures are similar [23]. In addition to prevention methods, WHO also listed out some of basic activities that used to increases our natural immune system to defense any pathogens. Some of those activates are eating vegetables, doing physical exercise every day, minimizing using of much sugar, having limits for alcohol, stop smoking, reduce stress, etc. Based on WHO (2020) and health workers information, facemasks should be used by people who show symptoms of COVID-19 to prevent the spread of the disease from infected to others normal individual, use of facemasks is also crucial for health workers and people who are taking care of someone in close settings of infected individual [15, 16]. Yet there is no recognized therapeutic against corona viruses, therefore, as indicated in figure 2, prevention methods such as washing our hands regularly with soap following the procedure at least for 20 minutes, use hand sanitizer properly as indicated bellow in figure 2 by Rodas Firew Admasu, during coughing and sneezing use inside of our elbow, stop handshaking with anyone, stay at home to limit our social contacts and use face mask and gloves, and also cleaning our hands, cell phone, personal computer (PC), desktop computer mouth, doors handle, key-locks, and other simple common materials with sanitizer as recommended by WHO are advisable prevention methods [23]. Therefore, since scientists clarified that due to there is no recognized medicine or vaccine against the novel corona viruses, and so it is the responsibility of the representative government, health workers and all other educated people in the country to create awareness for their nations and it is must to implement all prevention methods by every individual of human being.

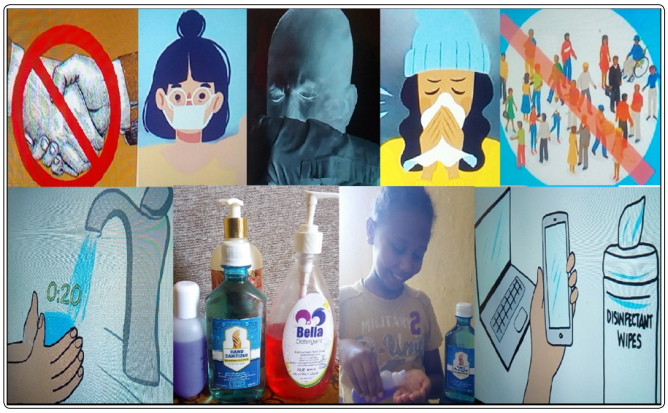

Figure 2: Current Standard Prevention Methods of the Novel Corona Virus (Covid-19) Suggested By Who to Be Implemented By Every Human Being Everyday [23].

Treatment of Corona Virus

Corona viruses are strong organisms that affecting any individual of human being all over the world of any age, sex, color, race, religion, education, etc and other animals. Corona virus is effective at hiding from the human immune system, and thus world scientists until now cannot developed any reliable treatments or vaccines to eradicate COVID-19. Therefore, executive director of the WHO (2020) health emergencies programme indicate that, there is no recognized therapeutic against corona viruses and so the primary objective on an outbreak of a corona virus is to give sufficient support to patients in terms of respiratory and multi-organ support. According to WHO (2020), epidemics can be controlled without drugs or vaccines, using enhanced surveillance, case isolation, contact tracking, infection control measures, etc and also developing new vaccines takes long time ranging from one year to 18 months. However, there is great progress being made a number of vaccine have appeared since COVID-19 was discovered [23]. In developing a vaccine, scientists are looking at the spike proteins intensely and which are present on the surface of the virus, enable it to enter human cells where it can replicate and make copies of itself. The protein is prevalent in corona viruses and the researchers a head start on building candidate vaccines against part of the spike protein and, using animal models, they have already demonstrated an immune response. In addition, based on genetic information about the virus, there is a diagnostic test

in the laboratories that can determine if we are infected. Based on America public health committee (2020), if once a corona virus infection is confirmed, the treatment is mainly supportive, making the patient to get enough oxygen, managing his or her fever and using a ventilator to push air into the lungs if necessary. The National Institutes of Health, most mild recovered people told to drink abundance of fluids such as water within two weeks continuously for the normal function of our immune system [16, 23]. A corona virus vaccine is still months away and perhaps years and while new technology, advancements in genomics and global coordination have allowed researchers to act quickly, vaccine development remains an expensive and risky process. Scientists at the National Institutes of Health and several companies are working on vaccine candidates. The National Institute of Allergy and Infectious Diseases (NIAID, 2020), a beginning clinical trial might get off the ground in as little as three months, but researchers would still need to conduct extensive testing to prove a vaccine was safe and effective [16]. Finally, due to the novel corona virus (CoVID-19) do not have any medicine or vaccine, therefore, implementing prevention methods are the only solution for the new pandemic zoonotic disease that caused by corona virus.

Evolution and Epidemiology of Novel Corona Virus

The evolution and epidemiology of the novel corona virus explanation indicates that the spreading of the virus initially from the originated country to all over the world in different ways of transmission. Therefore, the sub part of this article contain brief explanation about evolution and epidemiology of the new corona virus (COVID-19).

Evolution of Novel Corona Virus

Based on evolutionary biology, microorganisms like virus and bacteria have ability to evolve rapidly than other micro and macroorganisms. Example, there are different types of corona viruses, such as common cold, SARS, MERS and COVID-19 are grouped in a family of corona viridae viruses containing strains. The most recent common ancestor of all corona viruses probable as existed as 8000 BCE, back as more than 55 million years ago, implying long term co-evolution with bats. In addition, the most recent common ancestors of the alpha and beta corona virus of gene source and perfect hosts are mammals (bats) which lined placed at about 2400 and 3300 BCE, respectively and also the gamma and delta corona virus of gene source perfect hosts are avian (birds), which lined at 2800 and at about 3000 BCE respectively to corona virus evolution and spreading [17,18].

Epidemiology of the Novel Corona Virus

Epidemiology of novel corona virus indicates, the virus have been first originated in Wuhan, China from seafood sale market of sells fish, bats, snakes and pangolins and then spreading in the world to more than 200 countries of Asia, Europe, North America and the Middle East and since its discovery in late 2019 and the number of confirmed cases and reported deaths from all over the globe are rapidly increasing. The first outbreak of novel COVID-19, was began last December, and it has been declared as a pandemic by World Health Organization (WHO, 2020). As informed by WHO (2020), the respiratory illness that caused by the new corona virus, spreading across the world, millions are infecting and died, as global epidemiological data indicated in table 1. The number of infections may be doubling at every six days [23], but the nation's capacity to test for the infection of COVID-19 has lagged [16].

Table 1: Epidemiology of the novel corona virus [16, 23].

Spreading rates of COVID-19 per days	Infecting and epidemiological power throughout the world	
	Number of infected people	Number of died people
Within 100 days	About 2.8 million people	About 200,000 people
Within 120 days	More than 3,836,183 people	More than 265,364 people
Within 150 days	More than 9 million people	About 465,000 people
Within 180 days	About 14.5 million people	More than 606,000 people
Within 220 days	About 25 million people	About 846,000 people

According to WHO and health workers reported on the novel pandemic corona virus epidemiology at worldwide, large number of human being infecting and death rates are recorded in USA, and also highly spreading and infecting Brazil, UK, Spain, Italy, China, France, Germany, Turkey, England, South Korea, Russia, Iran, India, etc and all African countries such as South Africa, Egypt, etc. Similarly, based on worldwide epidemiological data report after 120 days indicates that, more than 3,836,183 people are infected, about 1,307,608 people are recovered from the virus and more than 265,364 people are died and also infection and death rate is extremely high in America, then Britain, Spain, Italy and others. The more recent information on COVID-19 epidemiology indicates, more than 9 million people were infected and about 465,000 people were died within 150 days and still highly infecting in USA. Based on worldwide epidemiological data, about 14.5 million people were infected, of which more than 606,000 were died within 180 days and also it creates negative economic impacts especially in developing countries. At the end of August, 2020, about 25 million peoples were infected in all over the world, of which about 846,000 peoples are died by COVID-19. Similarly, its epidemiology of all over the world creates great negative economic and political impacts, loss of jobs, migration and other conflicts, especially in developing countries. Based on the report of general director of WHO, Tedros Adhanom Ghebreyesus (2020), the spreading of the pandemic novel corona virus can be increase in all African countries, East Europe, middle and southern America, etc [16, 23]. Therefore, government and each individual of human being should implement all prevention methods of the novel corona virus.

In addition, getting an accurate death rate from COVID-19 is important for policy makers and health experts to control its spreading and to counter the outbreaks of the virus but determining the rate is quite complex. Early estimation of WHO, put the rate above 3% based on the number of deaths in comparison to the number of cases, but, about 3.4% of death reported worldwide by COVID-19 cases, as the report explained by the general director of WHO, Tedros Adhanom Ghebreyesus (2020) [23]. Therefore, the general epidemiological data indicates that the novel corona virus have been spreading and killing a number of individuals of all over the world.

Complications of the Novel Corona Virus

The new pandemic zoonotic disease caused by corona virus (COVID-19) are creating various complications on the life of human being specially on those highly risky people and on economic impact of every country particularly in developing

world. So, this part of explanation includes the complication of corona virus on the most risky individuals and negative economic impacts of the country.

Risky People by the Novel Corona Virus

All people found all over the world of any age, sex, religion, race, education and others can be infected by the novel corona virus (COVID-19). But its complications on people who are most vulnerable (high risk) to become severely sick (highly infected) and died with this new corona virus, such as old people, healthcare worker and people with pre-existing medical condition like chronic respiratory disease (like asthma and bronchitis), diabetes, heart (cardiovascular) disease, cancer, people with higher rates of consumption of tobacco, etc are the most risky people to be infected and died [23]. In addition, people who are living in poor health care infrastructures and food shortage, especially human being in developing countries may be at risk [19] and COVID-19 is highly affecting with high death rate of older generations (older than 60) much more harshly at risk. The WHO (2020) are advising to people of all ages, sex, and religions to protect themselves from novel corona virus using various prevention methods by following good hand and respiratory hygiene [23]. Therefore, it is very important to give most serious attention by representative government and other organizations found in the country to those health workers, to old people and other individuals who are suffering from those the above chronic diseases, and poor people with acute hunger living in the country to fulfill their basic requirements.

Economic Impacts of the Novel Corona Virus

According to World Food Program (2020) reported, the COVID-19 and global food security are the major threats that poses the globe and the risk undermining labors to rising hunger on the generation. The novel corona virus risks seeking undermining the efforts of humanitarian and food security organizations to face chronic undernourishments and food assistance over 100 million people. It have great negative economic impacts, such as extreme poverty and hunger, poor health care infrastructures, food shortage and increasing of food price, losing jobs and increase jobless people, conflicts within people in the country, migration of population, etc, especially in developing countries. The COVID-19 poses considerable risks to vulnerable populations who are living in countries with sever development deficits, limited governmental capacity and poor health care infrastructure like sub-Saharan Africa due to lack of testing capacity, even if the confirmed cases of corona virus were reporting the health care infrastructures are still lacking. According to general director of WHO, Tewodros Adhanom (2020), our greatest concern is the potential of spreading of the new corona virus to the countries with weaker health system. Similarly, many developing countries lack safety-net systems to fill that annulled for those about 20% of people living in low income and so COVID-19 poses a great threat to nations lacking healthy social safety nets. Because about 1.2 billion people of Africa face the highest percentage of undernourishments on the planet and so corona virus has proved especially for those who are elder, people suffering from chronic, acute hunger or malnutrition or whose health is already in question. In addition, globally novel corona virus have direct impact on the supply of food or price of staples food in the place affected by the virus and it may cause to slow or fall into depression of global economy and so exacerbating poverty and hunger [19]. Therefore, to solve and/or prevent this pandemic zoonotic disease, the world governmental and non-governmental organizations should focus in helping poor people specially developing countries, following and implementing each instructions of WHO, etc have great significant values to prevent and control this and other related worldwide problems.

Conclusion and Future Directions

Conclusion

In this real/faulty world, human being is affecting the natural environment and ecological needs of the other animals using their selfishness behaviour, due to losing of the natural habitat and so some animals are start sharing of food and habitat with human being, some peoples in different countries develops new culture of feeding and living with such animals, finally, various types of pathogens then pass from those animals to human and then spread throughout the world. Example, bat and rat are considered a possible source, pig and other animals are host of various pathogens, and they can transmit the virus to an intermediate host animal, like pangolins, others that may be consumed by human in some countries, and so the virus pass to humans. In addition, a novel corona viruses are respiratory virus with the protrude surfaces of spikes spreading to all over the world, leaving many health experts to fear a pandemic and can infect both animals and people, cause respiratory tract illnesses, infecting and killing millions. Zoonotic diseases are diseases first from an infected animal then transmit to humans, animals such as bat, pig, rat, tiger, snake, monkey, dog, cat, fish, etc may containing strains lethal diseases in mammals and birds and infecting every individual of human being of all over the world at any age, sex, race, religions, lifestyle, educational level, etc. Similarly, men are more likely to infect and die from an infection compared to women, because male produce weaker immune responses than female due to males have higher rates of consumption of tobacco, high motility and contact, diabetes and high blood pressure than female. In addition, the new corona viruses transmit from infected to normal individual by direct contact, respiratory droplets during coughing and sneezing, touching contaminated surfaces of objects with our hands then our mouth, nose and eye before washing with soap. The basic symptoms of the new corona virus is strong fever, high elevated body temperature, dry cough, muscle fatigue or pain, breathing difficulties, coughing mucus or blood, headaches, diarrhea in other animals, kidney failure and finally with pneumonia, the lungs inflammation, filling alveoli with fluid and this can be detected by an X-ray. However, in modern sciences, till now there is no known therapeutic against COVID-19. Therefore, it is advisable implementing prevention methods such as washing our hands regularly with soap, use hand sanitizer properly, during coughing and sneezing use inside of your elbow, stop handshaking with anyone, stay at home to limit social contacts and use face mask correctly must covering mouth and nose, use gloves and stop eating uncooked animal products as recommended by WHO and also better to create link with traditional healers.

Future Directions

Zoonotic diseases can be transmit from infected animals to human and other animals, therefore, protecting the natural habitat of such animals can be one of the basic prevention methods of different viral borne diseases. There are various types of pathogenic microorganisms but still much remains unknown about the virus, including how many people may have very mild infections, whether they can transmit the disease or not. Zoonotic animals such as bats, rat, insects like cockroach, etc are considered a possible source of diseases due to they can be host to many viruses and bacteria and also it is possible that bats can transmit the virus to an intermediate host animal, such as pigs, sells fish, snakes, pangolins, etc, which are consumed and then pass on the virus to humans being and then the outbreak grew the transmission from human-to-human, therefore, better to stop eating of raw animal products. Similarly, still global scientists didn't get the effective medicine or vaccine of COVID-19, how long the new corona virus can live on the surfaces of any objects, they doesn't know specific

host animals, which temperature and humid environments may slow down the spread of such pathogen's. In addition, infected peoples with corona virus can produce tiny respiratory droplets when they are breathing, talking, coughing or sneezing, which allowing the virus to affect the normal through the air. People who have close contact with those infected individuals, family members and health care workers, may catch by the new corona virus and so, until its medicine and/or vaccine is recognized by traditional and/or modern sciences. Therefore, the best thing to avoid getting infected is to follow the same general guidelines recommend by WHO, such as washing our hands frequently with soap, avoid touching our face, and keep a distance of at least six feet from anyone who is coughing or sneezing and also the transmission risk of infecting others with the new corona virus can be reduced by wearing a face mask, for those who have symptoms of a respiratory illness. It is advisable if scientists develop drugs or vaccine that can initiate the human natural immune system from COVID-19 recovered people and also it is better creating link between modern and traditional medicine healers to share their knowledge. Finally, based on bible and Orthodox Tewahido religious educational explanation, animals can be edible if they have (<20%) and non-edible (>80%) pathogen concentration in their oral cavity, in addition to their feet nature and feeding (regurgitation) habits. Therefore, scientists should identify those animals with their oral pathogenic concentration, people should not eat raw meat of those animals and also it is better to focus on organic nature of any food items. In addition, to share the knowledge of traditional healers, it is important to create link between traditional knowledge and western knowledge/modern sciences.

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