



Climatological and social fallacies about COVID-19 pandemic

Ambar Farooq¹ · Uttam Kumar² · Junaite Bin Gais Uddin³ · Muhammad Haroon U. Rashid⁴ · Mator Mohsin Gilani⁴ · Taimoor Hassan Farooq⁵ · Awais Shakoor⁶ · Matloob Ahmad¹

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Abstract

Coronavirus disease (COVID-19) has emerged as a major global challenge since 2019. With the fast rise in the infected cases and deaths worldwide, many environmental and climate-related myths and fallacies spreaded fast. These fallacies include virus cannot spread in hot and humid conditions, cold weather can inhibit the virus, drinking hot water and sunlight can help cure the COVID-19, ultraviolet (UV) disinfectant lamps and UV rays from sunlight can kill the virus, use of hairdryers and hot showers for virus prevention, etc. Social norms and mindset of the people in the world towards a pandemic are quite similar. The primary purpose of this article is to enlighten the readers regarding these climatological misconceptions and social fallacies, helping spread proper knowledge and manage the outbreak of this deadly pandemic.

Keywords Community safety · Public health · Environmental-related myths · Misconceptions · Coronavirus (COVID-19)

Introduction

A novel coronavirus (nCoV) originated in China in late December 2019, and Wuhan was the epicenter of this pandemic (Ahmadi et al. 2020; Doğan et al. 2020; Shakoor et al. 2020). Massive number of people were infected by this virus, as situation got worse with each passing day (Guan et al. 2020). The disease was officially called coronavirus disease

(COVID-19) by World Health Organization (WHO) (Ma et al. 2020), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It was the third coronavirus infection after severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) (Zhu and Xie 2020). After being exposed to the virus, it can take up to 14 days for symptoms of COVID-19 to appear. The main symptoms to look out for are coughing, shortness of breath, fever, and sore throat. Moreover, COVID-19 has also been identified in feces of symptomatic and asymptomatic

Ambar Farooq and Uttam Kumar have contributed equally to this work.

✉ Awais Shakoor
awais.shakoor22@gmail.com

✉ Matloob Ahmad
matloob.ahmad@gcuf.edu.pk

Uttam Kumar
Uttam5454@gmail.com

Junaite Bin Gais Uddin
junaiteturjo@outlook.com

Muhammad Haroon U. Rashid
haroonrashid3838@outlook.com

Mator Mohsin Gilani
matorshah@gmail.com

Taimoor Hassan Farooq
taimoorhassan2055@gmail.com

- 2 College of Plant Protection, Fujian Agriculture and Forestry University, Fuzhou 350002, Fujian, People's Republic of China
- 3 Center for Molecular Cell and Systems Biology, College of Life Science, Fujian Agriculture and Forestry University, Fujian 350002 Fuzhou, People's Republic of China
- 4 College of Forestry, Fujian Agriculture and Forestry University, Fuzhou 350002, Fujian, People's Republic of China
- 5 College of Life Science and Technology, Central South University of Forestry and Technology, Changsha 410004, Hunan, People's Republic of China
- 6 Department of Environment and Soil Sciences, University of Lleida, Avinguda Alcalde Rovira Roure 191, 25198 Lleida, Spain

¹ Department of Chemistry, Government College University Faisalabad, Faisalabad 38000, Punjab, Pakistan

patients (Dong et al. 2020; Holshue et al. 2020; Liu et al. 2020; Wölfel et al. 2020). Initially, different case studies reported that COVID-19 had a low fatality rate (2.3%) (Shi et al. 2020; She et al. 2019) as compared to MERS (34.4%) and SARS (9.2%) (Wu and McGoogan 2020; Ceccarelli et al. 2020). However, a research study found that the number of COVID-19 patients doubled every 6.4 days identifying that COVID-19 was a much more dangerous and infectious disease than MERS and SARS (Wu and McGoogan 2020).

With the past experiences of previous pandemics, it is known fact that perturbations and misapprehensions arise in the people's minds when a disease spreads so quickly in the population (Leslie et al. 2013). In today's world, when almost people are connected to a vast internet network, the main concern is the fast flow of information (Leiner et al. 2009; Goodchild and Glennon 2010). When this information becomes misinformation, it becomes a significant issue for the governments and health officials (Bode and Vraga 2018). This misinformation may also take the public into an unnecessary chaotic situation and may even threaten many lives. Misinformation can lead society to inappropriate behavior and to many social fallacies (Qureshi and Shaikh 2006). Removal of these misinformations from spreading in the population along with the virus and providing the correct information will help correct society's perception towards a pandemic and will help lower the disease risk and spread (Reyna 2012). Social norms are similar worldwide due to the same mindset of the population at large (Hassan and Azfar 2003; Khilji 2012). During a pandemic, it becomes essential to know about the attitude, knowledge, social norms, and behavior of a society (Ferrante et al. 2011). This commentary covers the recent climate-related myths and social fallacies that were spread during the COVID-19 pandemic. It gives a reasonable and scientific explanation of such social misconceptions by using references from various resources.

Climate-related myths

While many believe that the novel coronavirus cannot spread in hot and humid conditions, the data shows a different story (Zhu and Xie 2020). Although some researchers reported a decline in cases during high-temperature conditions (Bashir et al. 2020a, b; Dogan et al. 2020; Ma et al. 2020; Rehman et al. 2020; Wang et al. 2020), others said the opposite (Jamil et al. 2020; Zhu and Xie 2020); moreover, nothing is officially declared by World Health Organization (WHO) about this. According to the recently published pole report on infection and death, this virus can leave a devastating impact in any climate, including the hottest and humid areas (Jamil et al. 2020). For example, the United Arab Emirates and Saudi Arabia are among the hottest countries with 37.75 °C,

and 36.5 °C average annual temperature. Both these countries are suffering from the impact of COVID-19 virus outbreak (Livingston et al. 2020). Humidity has also proven to be a mere myth in the case of the COVID-19 outbreak. Some of the most humid places like Arizona, California, Bangkok, Kuala Lumpur, Malaysia, Indonesia, Panama, and Singapore etc., with numerous COVID-19 infections and deaths, have proved this hypothesis nothing but wrong (Ahmadi et al. 2020; Ministry of Health of the Republic of Panama 2020; World Health Organization 2020). Moreover, available data shows that some of these regions are not new to viral outbreaks. MERS affected many in the hot conditions of the Gulf region back in 2012 (Aburizaiza et al. 2014; Almutairi et al. 2015). It indicates that coronavirus can survive, infect, and create destruction in any climate (Jamil et al. 2020; Zhu and Xie 2020).

There has been a myth that drinking hot water and sunlight can help cure the coronavirus, but to date, there is no proof that these two things can control and kill COVID-19 virus (World Health Organization 2020). Drinking lukewarm water and getting sufficient sunlight can have some other health benefits, but it doesn't directly relate to preventing or killing the virus. Another myth was cold weather and snow can kill or inhibit the new coronavirus. WHO has already declined this theory (Ali et al. 2020). There is no scientific evidence that cold weather or snow can kill the virus or prevent infection. In China, it spread in the winter season, including the northern regions with very low temperatures and regular snowfall.

Another myth was that ultraviolet (UV) disinfectant lamps and taking UV rays from sunlight kills the virus (World Health Organization 2020). Among UV-A, UV-B, and UV-C, UV-C can demolish any genetic material, including infections. In that sense, it can be assumed that exposing the body to sun may kill the virus particles present on the skin surface (Hopman et al. 2020). Even if counting this assumption, it can't treat people who are already affected because the sunlight can't pass through the outer layer of skin and reach the internal organs. UV-C rays from sun are unable to reach to surface environment as it is absorbed by the atmosphere and the available data on SARS, a closely related virus to novel coronavirus, shows that exposing the virus to the UV-A rays for 15 min has no impact on the infection rate of SARS virus (Kariwa et al. 2006). UV-C rays commonly used as disinfectanting rays were inadequate to inactivate the SARS virus. Moreover, according to the WHO, UV-C is highly prohibited for operating on the skin because it has a high chance of causing severe damage to human health.

Many around the world believe that thermal scanners can detect the virus. A simple understanding of the mechanism of the thermal scanner is enough to remove this misconception. Thermal scanners only detect people with higher body

temperature, not the virus. According to the recent article, in most COVID-19 infections, it can take up to 14 days for symptoms to appear and hence thermal scanners may not be effective during this time period (Li et al. 2020) (Fig. 1).

Social fallacies about COVID-19 pandemic

As alcohol is used in almost all kinds of sanitizers (Sakamoto et al. 2010), so it became a common social fallacy among people that drinking alcoholic beverages can control the spread of COVID-19. Alcohol is a commonly used disinfecting liquid that needs to be handled carefully while operating on the human body as it is harmful to mucous membranes (i.e. eyes, mouth). Excessive alcohol thronging or consumption can increase the risk to human health. Ethanol kills microorganisms by dissolving the lipid membrane and denaturing the protein. However, ethanol needs to reach the microorganism to kill it.

Garlic is believed to have antibiotic properties in most Indian Ayurveda books (Yoshida et al. 1987); it made people think that eating garlic helps prevent the new coronavirus infection. Its scientifically proven that garlic is a healthy food with antimicrobial properties; however, there is no evidence available that garlic has protected people from the coronavirus (World Health Organization 2020).

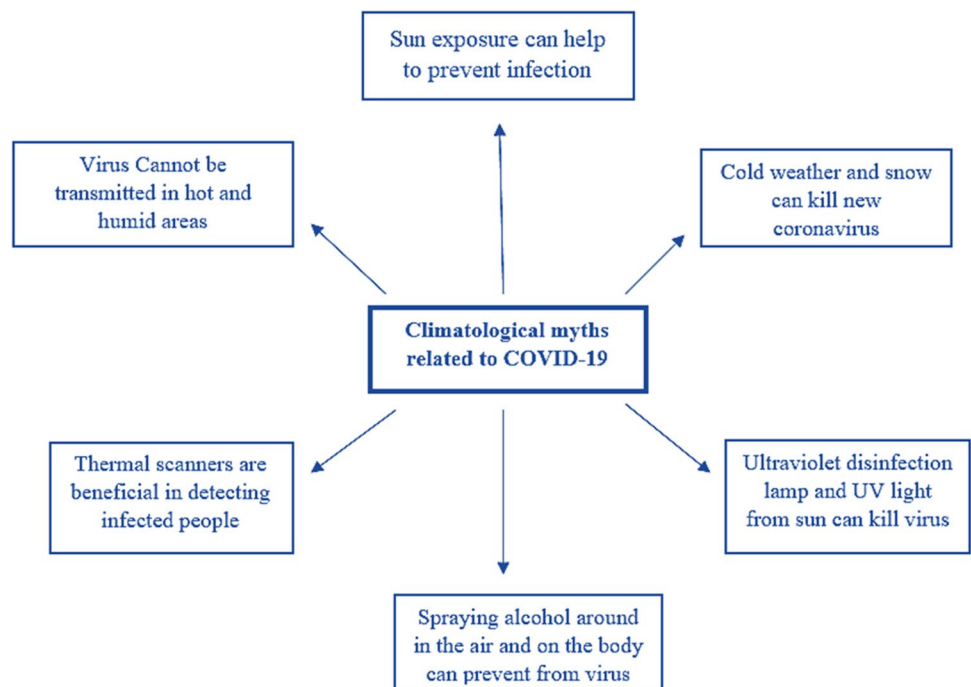
Some people believe that the coronavirus can spread through 5G mobile networks. While discussing this in scientific terms, radio waves/mobile networks can never be the medium of travel for viruses. There is enough research

available that proves COVID-19 is spreading through droplets when an infected person coughs, sneezes, or speaks. People can also be infected by touching a contaminated surface and then touching their eyes, mouth, or nose (Mittal et al. 2020).

It was a point of discussion between people that vaccines against pneumonia protect against the coronavirus. Still, there has been no proven research that supports such results. Nabity-Grover et al. (2020) reported that vaccines against pneumonia, such as pneumococcal vaccine and Hemophilic influenza type B (Hib) vaccine, do not protect against the coronavirus. According to the researcher from Trinity College Dublin, BCG (Bacillus Calmette–Guerin) vaccine can be one reason for the fewer cases of COVID-19 in South- and Southeast Asia compared to Europe and USA. BCG vaccine can train the immune system for responding to a variety of infections such as viruses, bacteria, and parasites (Larsen et al. 2020). Still, there is no proven research that can show the effect of this vaccine on COVID-19 prevention.

It was rational thinking that gargling regularly with saline water can help prevent the infection of COVID-19. Still, there is no evidence that gargling can save people from the new coronavirus disease. There may be some soothing effect of saline water gargling on a sore throat; however, this kind of practice cannot stop COVID-19 virus infection (World Health Organization 2020). Few reports claimed that regular rinsing of the nose with saline might help people recovering faster from the common cold, but no such evidence is available in COVID-19.

Fig. 1 Environmental/climatic myths and misconceptions related to COVID-19



There is another fallacy that hot water can prevent from COVID-19 infection. Average body temperature will remain nearly constant from 36.5 to 37 °C (Grodzinsky and Levander 2020), regardless of the temperature of water one uses. Sometimes, the hot water bath can have a burning effect on the human body (Bando et al. 2020). During infection, the human body tries to kill the virus by raising body temperature. A hot bath cannot induce fever or kill the virus. Hand dryers also cannot be considered as a preventive measure for COVID-19 infection.

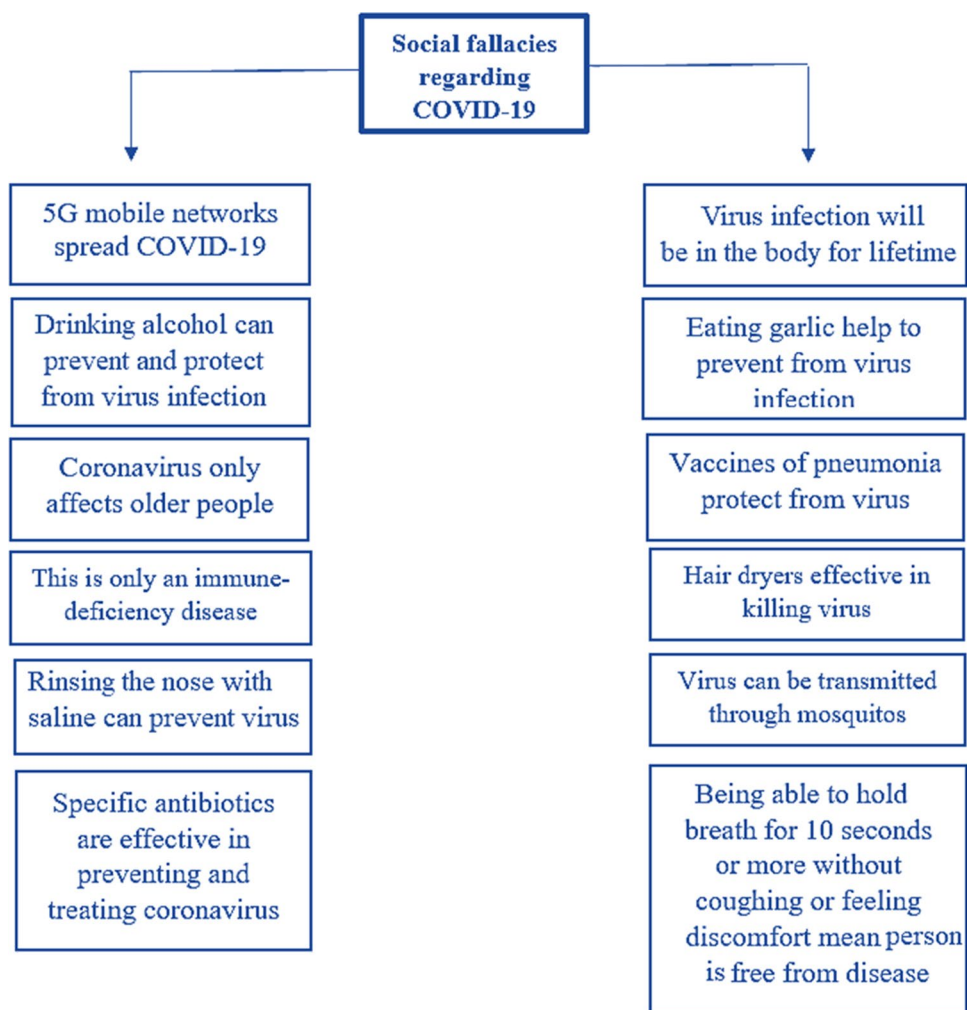
It's tough to imagine food without any spices and condiments in many regions of the world (Kalra et al. 2020). These spices have many health benefits for the body (Wacker 2020). Due to these health benefits, much research has been done on individual herbs to know more about the claims made by many people for these spices (Sanlier and Gencer 2020). In recent days there are many claims such as ginger, turmeric, etc., can help prevent from infection of new coronavirus. South Asian people have used spices for a long time, and many spices have shown antimicrobial properties (Hashmi 2020). Still, there is no scientific

evidence that these spices can prevent COVID-19 infection. Usually, people have a question in their minds that infection of new coronavirus means it may have a lifelong impact. However, most of the people who get COVID-19 disease recover and eliminate the virus from their bodies (Fig. 2).

Myths related to Covid-19 vaccine

Pfizer, Moderna, AstraZeneca, Sputnik V and Sinopharm vaccines got approval in many countries such as the USA, UK, European Union, India, Russia, China etc. However, many around the world believe that due to their quick development, the vaccines are not safe. Previous studies related to the coronaviruses, such as MERS and SARS, helped in speed up of the process for development of vaccine against SARS-CoV-2. The vaccine was developed rapidly due to scientific advancements, but the vaccine's clinical trials and effectiveness were not compromised (Vashishtha and Kumar 2020). Many believe that vaccines can have long-term effects on health. More or less, the side

Fig. 2 Social fallacies among people related to COVID-19



effects, reactions, and complications of the vaccines can occur within minutes to hours or sometimes a few days of receiving the vaccine in a fraction of the cases (Baden et al. 2020a, b). However, in most of the cases there are no side effects and immunity against the virus is high. Preliminary evidences have showed that a vaccine will give better protection and result in lower mortality against the novel coronavirus (Lee et al. 2020).

Many vaccine developers are using messenger RNA (mRNA) to protect from SARS-CoV-2 (Zhang et al. 2020). Scientifically it is proven that mRNA only provides the blueprint to manufacture the proteins, which will prevent COVID-19 infection (Cohen 2020). Many around the globe also believe that the vaccine will make people infertile. There are no clinical trials that provide single evidence regarding the effect of the Covid-19 vaccine on the human reproductive system and sexual behavior (Babaei et al. 2020). In contrast, a COVID-19 positive pregnant female can have a miscarriage or premature labor (Boelig et al. 2020).

Concluding remarks

People mindset towards a threat and unforeseen issue, especially related to pandemics, is quite similar around the globe. Majority of the population starts believing in climatic/environmental-related myths and social fallacies regarding prevention measures and cure. Knowing about these myths and misconceptions can help the government and the health officials to make a road map for countering the pandemic by creating awareness among the community through different ways such as social and print media. By and large, the truth is not merely a fierce battle with ignorance and fallacy, but, first and foremost, with preconceived ideas and aprioristic conceptions. In these challenging times of fight against a deadly novel virus making the mindset of people free of climatological myths and social fallacies is important. People can be aware of a correct and better way to save themselves from this deadly virus. To win the battle against any pandemic, it's essential to establish a sustainable and effective disease management system which should include countering the myths and fallacies surrounding it.

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Declarations

Conflict of interest The authors declare that they have no conflict of interest.

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