

## Review Article

# COVID-19 Pandemic: The Two Sides of the Same Coin

Marinković S<sup>1\*</sup>, Arandjelović N<sup>2</sup>, Lević E<sup>2</sup> and Tomić I<sup>3</sup>

<sup>1</sup>Department of Neuroanatomy, Institute of Anatomy, Faculty of Medicine, University of Belgrade, Belgrade, Serbia

<sup>2</sup>Institute of Anatomy, Faculty of Medicine, Kallos University, Tuzla, Bosnia and Hercegovina

<sup>3</sup>Department of Art History, Academy of Fine Arts and Multimedia, Belgrade, Serbia

\*Corresponding author: Slobodan Marinković, Department of Neuroanatomy, Institute of Anatomy, Faculty of Medicine, Dr. Subotić 4/2, 11000 Belgrade, Serbia

Received: May 04, 2021; Accepted: May 27, 2021;

Published: June 03, 2021

## Abstract

The COVID-19 pandemic appeared suddenly, spreading all over the globe, making an impact on all aspects of our lives, and astonishing the completely unprepared world governments and the health care systems. The aim of this review is to examine the present and future consequences of the pandemic's psychological, social, political, economic and cultural impacts. Our lives have changed abruptly and dramatically. The high rates of morbidity and mortality, as well as the unpredictable duration of the pandemic, have caused anxiety and fear in many individuals. Facial masks wearing, distance keeping, the people gathering prohibition, and the introduction of quarantine and lockdowns, have profoundly distressed every single individual - of about 5.3 billion of the adult global population. However, designing and producing vaccines has been a great medical success. On the other hand, vaccine nationalism, the polarization of the pandemic crisis, and vaccine hesitancy will continue to undermine the main epidemiological goal: a prompt and extensive vaccination of the global population, in the addition to the natural immunity of the survivors. Without a radical political and social reorganization, and individual behaviors changes regarding this crisis, the COVID-19 pandemic could last for several years.

**Keywords:** COVID-19; Ethics; Pandemic; Politics; Social behavior; Vaccination

## Introduction

Covid-19, following the involvement of the global population, has changed lives of every single human being on the planet with alterations of every aspect of living [1,2]. The impact of the pandemic has been medically and scientifically so urgent and challenging, that already over 125,000 articles on this subject have been published during the last year and a half. In this pandemic, many tragic destinies happened, and many bad and good individual and social behaviors appeared, with long-lasting consequences [3].

Thus, most of the infected patients are transported to Covid hospitals with no possibility to be visited by their families. In the grave stage of the disease, they die all alone. The lives of us who have not yet been infected have been turned upside down. In any case, entire humankind is in grave danger – in the biological, psychological, social, cultural, and economic sense.

The aim of this review is to examine the individual, social, political, ethical and moral impacts of the pandemic, and to predict the possible biological and social consequences for humankind. To do this, a large body of literature was retrieved by a selective search of several databases, predominantly Google Scholar, ResearchGate, Kobson, and PubMed. Publications were obtained by typing certain key words for each single aspect of this subject.

## The Biological Aspect of the Pandemic

As already noted in our previous paper [4], every few years new viruses, or new strains of viruses and bacteria appear, which can cause local epidemics or global pandemics. This subject was also elaborated by some other authors [5-7]. One of the reasons for such events is the human devastation of certain ecosystems [5,7], and thus a close contact with infected wild animals, but also the biological struggle

of microbes for their survival [7]. In any case, these events require new vaccines and medications, as well as certain epidemiological protection and prevention measures.

As cited by us, "The infectious agents are biologically very successful, so that our struggle against them will last forever" (cit. [4]). The Coronavirus Disease-2019 (COVID-19) pandemic, caused by the novel Coronavirus 2 (SARS-CoV-2) [8]), has fully confirmed our cited conclusion, that is, the existence of a permanent biological combat between humans and microbes.

At the beginning, COVID-19 generally showed a relatively mild course in 80%, a severe course in only 20 % of the patients, with a lethality rate of 0.3-5.8 % [9]. Soon after, however, the virus spread, and continuous to do so, very quickly, affecting almost every part of the globe. New strains are transmitted even more rapidly, raising the morbidity and mortality rates in adults, but also in the younger population.

In addition, this virus has another trait. Namely, some races and certain ethnic groups have shown different susceptibility to the infection. For instance, "Asians and Hispanics have much lower overall levels of risk compared with either Whites or Blacks" (cit. [10]). Yet, the most recent mortality rate in the Hungarian population, which is Asian in origin, and Czech of Slavic origin, were the highest in the European Union - EU (<https://www.statista.com/statistics/1111779/Coronavirus-death-rate-europe-by-country/>). The reason for such disparities is unknown. Finally, the worst situation is occurring in India, mainly with Indo-Aryan people, where over 300,000 new patients are registered every day, due to the overpopulation, a low hygiene conditions, and certain religious procedures. It is without doubt that there is a true natural selection in progress [7].

## Individual Behavior

Every individual on the planet has experienced more or less acute changes, including those of the general psychological state, e.g. moods and emotions, attitudes, opinions, personal wishes, planning, freedom, social relationships, the cultural domain, and economics [1,2,11,12]. Each of us have realized the uncertainty of our future, i.e. the danger of becoming seriously ill and even dying in a situation where dozens or more people are losing their lives within our community every single day. Unfortunately, our friends, relatives or even members of our families are occasionally among those.

Such a permanent, chronic stressful uncertainty about the future, the unpredictable pandemic duration and fear of death in a terrifying environment, may cause worry, anxiety, fear, despair, insomnia and occasionally depression, as well as posttraumatic stress disorder in survivors [2,13,14]. Many psychological defense mechanisms are activated, even substances abuse [1,14,15]. Creativity, film watching, and music or drama psychotherapy in these and similar situations are some of the most useful methods to maintain our well-being, as shown in our previous article and some other publications [16,17].

## The General Social Impact

The pandemic has influenced every single aspect of our personal and social lives [15]. Direct interpersonal relationships are greatly restricted, due to a necessary physical distance and social isolation (quarantine), so that people gathering is practically impossible for epidemiological reasons. As a consequence, restaurants, shopping centers, museums, art galleries, cinemas and concert halls, theatres and opera houses, and schools are closed. Sport matches are holding in empty stadia and other sport grounds, business and scientific meetings are postponed or replaced by safe video conferences, and various ceremonies and even private parties are forbidden [18]. Due to the social distance order, transportation is risky and complicated [19], and many tourist places are affected by the pandemic [20], so that most of us shall spend our summer vacation at home. Obviously, a complete social reorganization is necessary under these new circumstances [21].

Although technological progress, especially digital technology, has enabled communication at a high level by means of smart phones, the Internet, social networks, online platforms, and electronic media [22], there is a limited possibility of establishing direct contacts (Figure 1), which are extremely important for us as social beings. As a consequence, our social lives are thrown in disarray, sometimes to the level of loneliness, suffering, despair, depression, and even suicidal ideation in some cases [1,2,12,13,22,23].

Moreover, there is another social impact, which is related to establishing new friendships, and especially meeting potential partners. In fact, even wedding ceremonies have been prohibited (Figure 2). In addition, since pregnant women, and even their babies, can also be infected with COVID-19 [24], an unavoidable consequence of this situation will be a great decline in natality in the years to come, especially in developed countries, which already have this demographic issue.

## Specific Social Aspects

This section is mainly related to vaccines, which are the crucial



Figure 1: No close contact! (Photo S Marinković; Permission by S Marinković).



Figure 2: Even wedding ceremonies have been forbidden (Photo S Marinković).

issue and the only medical solution to be applied to stop the pandemic.

## Vaccines and humanity versus business interest

As soon as the pandemic began, the pharmaceutical companies started to develop the technology for creating and producing the safe and efficient vaccines. Some used the classical procedure with inactivated COVID-19 viruses (Chinese), some others designed adenovirus-vector vaccines (Russians), and still others (Americans and British scientists) developed new technologies for using certain RNA or DNA sequences, mRNA, or some viral proteins as antigens, which are to activate the human immune system to produce specific antibodies, as well as to start and enhance a specific cellular defense [25,26]. Thousands of scientists and other members of their staff managed to design the mentioned vaccines and to test them on lab animals and then on humans within an incredibly short time, which represents a great technological and medical success in saving the lives of millions of people.

However, from the very beginning, a race started for vaccine designing and manufacturing as soon as possible, in order to be among the first on the world market [27,28]. Pharmaceutical companies, which were distributing vaccines to many countries, have already gained a profit of billions of dollars. But, several technical

problems have appeared.

One of the main problems is a limited production of vaccines on the part of the companies. And yet, when children and teenagers are excluded from the global population of almost 8 billion, the remaining about 5.3 billion (<https://data.worldbank.org/indicator/SP.POP.0014.TO.ZS>) are adults who can be vaccinated, and who need 10.6 billion of vaccine units. Accordingly, no company has the capacity for such a mass vaccine manufacture. Due to that, several companies have started to sell licenses for the production of their vaccines in other countries. In any case, some healthcare professionals suggested removing the profit motive in the case of COVID treatment.

### Vaccines and selfishness versus solidarity

In September 2020, the global organization COVAX, related to the COVID-19 pandemic, was founded for a fair vaccine distribution [27]. "Bringing together governments, global health organizations, manufacturers, scientists, the private sector, civil society and philanthropy, with the aim of providing innovative and equitable access to COVID-19 diagnostics, treatments and vaccines. The primary focus of the GAVI (Global Alliance for Vaccines and Immunizations) and COVAX AMC is to ensure that the 92 middle- and lower-income countries that cannot fully afford to pay for COVID-19 vaccines themselves get equal access to COVID-19 vaccines as higher-income self-financing countries and at the same time" (<https://www.gavi.org/vaccineswork/covax-xplained>). But, what happened with this idealistic and philanthropic COVAX programme shortly after its founding?

The majority of the largest pharmaceutical companies are located in high-income states. The political elite in most of these countries decided to vaccinate first their own population [27]. Thus, over 130 million people in the US, where the Pfizer and some other companies are sited, have already been vaccinated. Similarly, the British AstraZeneca vaccine has been applied in over 60% of the adult population in the UK (<https://www.statista.com/statistics/1196071/covid-19-vaccination-rate-in-europe-by-country/>). As a consequence, these companies have been successively delivering only small amounts of the vaccines to some other countries, including those in Europe. Due to that, the vaccination rate, for example, in France on April 19 was only about 25%, and in Germany only 27%. This is why the World Health Organization (WHO) recently criticized the European states for such a slow vaccination.

The worst situation is in the least developed countries, which are too poverty-stricken to pay for any type of vaccine. Some of these countries have not yet obtained a single dose of them, in spite of the COVAX programme and an appeal from both the United Nations and WHO to high-income countries to help the less developed ones. This nation-state priority represents an example of selfish and irrational behavior of the power countries, since the pandemic cannot be defeated unless most of the global population is vaccinated [29]. "Each day matters for the health and lives of tens of thousands of people" (cit. [27]). As a consequence, the pandemic will last a very long time, according to our evaluation and prediction.

In any case, the COVAX programme turned out to be more or less an illusion and a false hope for low-income countries. Ethics and humanity in the present situation seem to be the neglected concepts

in combating the pandemic [30]. This is why Garfinkel et al. [27] entitled their article as follows: "Survival of the wealthiest?"

Fortunately, there are some bright spots in certain countries. For instance, although only 220 million have been vaccinated in China, this country exports millions of vaccine doses to many states, especially to poor ones. It is a similar case with the Russian Federation. However, there is another example as well. Namely, the Republic of Serbia, a small country in the Western Balkan, donated over 100,000 vaccine units to their neighboring countries, which had not received a single dose from the COVAX programme or any other source. The donated vaccines were used for the inoculation of their medical staff on covid wards. In fact, these events were reported by several international agencies and media, e.g. Reuters and CNN [31,32]. Very recently (April 18), France was the first European state to donate 100,000 doses to some undeveloped countries.

### Other Social Domains

Among various social aspects of the pandemic, we draw attention to the political domain and vaccine allocation.

#### The political aspect

Politics globally involve every aspect of human life, including the health care system [20]. In general, the political reaction to the pandemic mainly depends on the type of the government and the social system in the corresponding countries. According to Greer et al. [33], "there will be no way to understand the different responses to COVID-19 and their effects without understanding policy and politics". The reaction depended on "the regime type (democracy or autocracy), formal political institutions (federalism, presidentialism), and state capacity (control over health care systems and public administration)".

Obviously, politics can have a great impact, either good or bad, on various aspects of the pandemic. For example, China reacted promptly on the local COVID-19 epidemic and undertook effective actions, which stopped the virus infection from spreading quickly, probably due to its centralized powers and a communist past [33,34]. On the other hand, Presidents Trump from the democratic US "adopted destructive denialist approaches to the epidemic, which undermined efforts to respond effectively" (cit. [33]).

Further, due to long-lasting political disagreements, geopolitical interests, and animosity between the Western Europe and the Russian Federation, EU politicians hesitated for many months to suggest the testing and eventual authorization of the Russian vaccine. It was the same case regarding the Chinese vaccine, due to economic rivalry and a political disagreement between the EU and the Republic of China. Hence, most Europeans had no other choice but to apply epidemiological measures: wearing masks [35], hand disinfection [36], social distancing [19], and a drastic social disconnection in the term of lockdown restrictions in certain regions or the entire countries [22,37].

There are occasionally some paradoxical situations in this domain. For a example, San Marino, a small country in the middle of Italy, obtained the Russian vaccine Sputnik V and quickly vaccinated the entire adult population (<https://www.nytimes.com>). However, Italy, being a member of the EU, could not order and administrate

the Russian vaccine. Yet, Hungary, also a EU member, has been using both the Russian and Chinese vaccines for several months. Similarly, the Czech Republic is planning to import the Russian vaccine, whilst Austria has already ordered one million doses of the same vaccine. Moreover, until recently, no one could enter the Western European countries (except Greece) with a certificate confirming a vaccination with the Russian or Chinese vaccines.

This is what we call a “political madness.” Namely, due to such EU behavior, dozens of thousands of European COVID patients lost their lives, which would not have happened if the politicians had allowed the usage of the mentioned vaccines. In this case, politics seemed to be much more important than human lives. Such a behavior is inadmissible, bizarre and deadly. This is not an attribute of democracy or civilization but, on the contrary, of an irrational, inhuman behavior resulting, in point of fact, killing of ones’ own citizens for political reasons.

It was a similar case with some irrational decisions by particular politicians. For example, the Serbian Prime Minister, instead of ordering a lockdown of the ski resorts in February of this year, as was recommended by epidemiologists and already done in other European countries, officially opened the new ski season on the Mountain of Kopaonik (<https://www.blic.rs>). The disastrous effect of this decision has been a new outbreak of the epidemic which caused an overload of intensive care wards, deaths of hundreds of people, and the disability of thousands of others, in spite of a successful and extensive vaccination.

### **The European debacle and a bright spot**

Vaccine nationalism, instead of vaccine cosmopolitanism [38-40], has resulted in a desperate demand but at the same time in a great shortage of vaccines in many countries, especially in those within the EU. As already noted, the EU has refused to use the Russian and Chinese vaccines. In addition, EU politicians believed in the COVAX system, which has almost completely failed. Why?

First, the huge EU bureaucracy needs months of negotiations and consensus among their heterogeneous members about any serious problem, including the COVID-19 crisis. On the other hand, the pandemic requires prompt and effective political, social and medical reactions, which have virtually failed in these high-income countries. As a consequence, the morbidity and mortality rates in these countries have been raised exponentially, leading to about 1 million of fatal outcomes so far. Many of those people were de facto victims of Europe’s bureaucracy incapacity. Moreover, due to the slow rate of vaccination, many other people are going to die within the next few months.

On the other hand, the authorities of the mentioned Republic of Serbia had not trust in the COVAX programme from the very beginning, which was proven accurate, since the first vaccine doses were delivered to Serbia only on April 4, 2021 (<https://www.facebook.com/watch/?v=450167912708977>). Due to that, direct contacts and negotiations with vaccine manufactures in the US, Great Britain, Russia and China were made, and several millions of vaccine units were paid for a few months before they were ready for usage. As a result, Serbia is now among the leading countries in the vaccination rate, not only in Europe but also in the rest of the world, as well as

the only country where people can choose one of the four available vaccines for free. Accordingly, this small state has implemented a more effective policy and public health response to COVID-19 than many high-income countries [33].

### **Vaccination and human rights**

The EU authorities, and those in many other countries, claim that there should be individual decisions about their immunization. In other words, no individual is obliged to receive a vaccine because this would be, as they said, a violation of human rights [41]. In other words, such an individual who, in addition, fails to adhere to the epidemic measures, might infect dozens of people in the surroundings. Thus, this attitude at the peak of a dangerous pandemic is irrational and epidemiologically unacceptable, since such an individual endangers a lot of other people and their human right to life.

Accordingly, there should be a consensus about how “human health (and life) takes primacy over human rights” (cit. [41]). By coincidence, on April 8 of this year, the European Court of Human Rights in Strasbourg ruled that “compulsory vaccination can be considered necessary in a democratic society” (<https://www.euronews.com>). This could be the basis for a possible mandatory vaccination against the COVID-19 worldwide.

### **Individual and social vaccine hesitancy**

Some individuals, as well as certain groups within the anti-vaccination movement, refused to receive a jab [3] (Megget 2020), and even some of the healthcare professionals, especially nurses. Thus, about 25% of the medical staff in Italy was not vaccinated, even some working on covid wards (personal information), which is a great risk to both them and their patients. A research in France showed that 26% of the examined participants declined to be inoculated [42]. As noted by the WHO, “...vaccine hesitancy is one of the top threats to global health” (cit. [3]). There are several reasons for such a situation.

First, due to the fear of possible vaccine complications, as well as due to a lack of proper knowledge about the vaccines and the virus itself. Second, it is strange, but unfortunately true, that some people believe that this virus is a political fabrication, or even that the pandemic is caused by secret and uncontrollable forces or by new biological weapons. In this context, China was accused by some US officials to have fabricated the virus in a secret laboratory [34].

All this is a manifestation of disinformation and conspiracy theories on social media [3]. In fact, such reactions are mainly a psychological defense from a sudden, surprising and unbelievable event, i.e. a kind of a Biblical Apocalypse, which has not been anticipated by anyone except by some biologists, microbiologists and epidemiologists. However, it also showed disunity and a political disorganization in Western countries, and some others, regarding the pandemic crisis [21].

Due to this misinformation, and for some other reasons, many people, especially among the youth, are against lockdowns or any other epidemiological restrictions and limitations in their countries. They are simply sick and tired of everything, and they would like to have their normal lives back. Unfortunately, this is in agreement with the opinion of the far right political parties, so that their social influence is becoming progressively stronger, mainly in the Western

countries. This has provoked several mass demonstrations in these countries, accompanied by a total ignoring of the prevention measures, which soon made the local epidemiological situation even worse, along with the addition of vaccine hesitancy. Such behavior will make COVID-19 more difficult to control, which in turn can prolong the duration of the pandemic to a great extent.

### The Covid pandemic and crime

Criminal minds use every opportunity to earn money at the detriment of others, even during the current pandemic. Thus, some announcements have appeared on the Internet offering “new” and “efficient medication” against the COVID infection, thus presenting a serious risk to public health. Moreover, some fake versions of vaccines with unknown contents have appeared in several countries on different continents (<https://www.bbc.com/news/world-56844149>). It is difficult for normal people to believe in the existence of such inhuman, heedless, unscrupulous, and dangerous psychopathological behavior.

### The Future of the Pandemic

Our near future is unpredictable due to all the mentioned factors and some other reasons.

First, of the approximately 5.3 billion of the adult global population, “only” some 160 million have been infected so far, with a death rate of over 3 million, according to a WHO report (<https://www.who.int/data#reports>). At the same time, only about 1 billion have been inoculated. Thus, there is a huge source of over 4.3 billion of new victims. Moreover, new strains of the virus have become virulent for younger population as well, so that there is an additional, at least, 1 billion of new potential victims. Consequently, if the global vaccination is not promptly and extensively carried out, the virus will have time to attack billions of the people.

According to the available data, only 2.6% of the global population has been fully vaccinated so far, with a lesser amount of doses (only 0.2%) being administered in low-income countries (<https://ourworldindata.org>). Taking into account a problem of the mass production of vaccines, the vaccine nationalism, their allocation, and an adverse health situation in underdeveloped countries caused by the failing of the COVAX programme, the pandemic could last for several years. Excler et al. [43] made an even more disturbing prediction: “Global implementation of vaccination may take a decade or more”.

Second, a global infection by a dangerous virus with fast and substantial mutations which increase its contagiousity and virulence, can have several important implications: a more rapid spread and the infection of much larger number of people, associated with severe clinical manifestations and a higher mortality rate, including those of a younger age; a virus resistance to the present vaccines, with a necessity for their modification or even new vaccines production, with another global vaccination campaign, and all the accompanying technical, political and social problems. Moreover, we have to receive a new vaccine shot each year.

Unfortunately, the situation will be complicated again by nation-priority vaccination, by the anti-vaccination movement, and by those people who refuse the application of prevention measures. For those

reasons, each one of us must understand the critical nature of the situation and take personal and social responsibility for our survival.

### Conclusions

Taking all the mentioned facts into account, it is clear that the COVID-19 pandemic will last for several following years at least, with a great impact on individual and social lives, as well as with a devastating effect on the global economy, the birth rate, world culture, and ethical attitudes. These consequences will be felt for many years to come.

### References

1. Stanton R, To QT, Khalesi S, Williams SL, Alley SJ, Thwaite TL, et al. Depression, anxiety and stress during COVID-19: Associations with changes in physical activity, sleep, tobacco and alcohol use in Australian adults. *Int J Environ Res Public Health*. 2020; 17: 4065.
2. Stein MB. Editorial: COVID-19 and anxiety and depression in 2020. *Depress Anxiety*. 2020; 37: 302.
3. Megget K. Even covid-19 can't kill the anti-vaccination movement. *BMJ*. 2020; 369: m2184.
4. Marinković S, Lazić D, Tomić I, Boljanović J. The biological and social survival of humankind. A review. *Austin Anthropol*. 2019; 3: 1005.
5. No authors listed. Preventing emerging infectious diseases: A strategy for the 21<sup>st</sup> century. Overview of the Updated CDC plan. *MMWR Recomm Rep*. 1998; 47: 1-14.
6. Fournier PE, Drancourt M. New microbes new infections promotes modern prokaryotic taxonomy: a new section “TaxonoGenomics: new genomes of microorganisms in humans.” *New Microbes New Infect*. 2015; 7: 48-49.
7. Campbell NA, Reece JB, Mitchell LG, Taylor MR. *Biology. Concepts and connections*. 4<sup>th</sup> edition. San Francisco: Benjamin Cummings. 2003.
8. Wang MY, Zhao R, Gao LJ, Gao XF, Wang DP, Cao JM. SARS-CoV-2: Structure, biology, and structure-based therapeutics development. *Front Cell Infect Microbiol*. 2020; 10: 587269.
9. Müller O, Neuhaan F, Razum O. Epidemiology and control of COVID-19. *Dtsch Med Wochenschr*. 2020; 145: 670-674.
10. Selden TM, Berdahl TA. COVID-19 and racial/ethnic disparities in health risk, employment, and household composition. *Health Aff (Millwood)*. 2020; 39: 1624-1632.
11. Açıkgöz Ö, Günay A. The early impact of the Covid-19 pandemic on the global and Turkish economy. *Turk J Med Sci*. 2020; 50: 520-526.
12. Bruns DP, Nina Kraguljac NV, Bruns TR. COVID-19: Facts, cultural considerations, and risk of stigmatization. *J Transcult Nurs*. 2020; 31: 326-332.
13. Cénat JM, Blais-Rochette C, Kokou-Kpolou CK, Noorishad PG, Mukunzi JN, McIntee SE, et al. Prevalence of symptoms of depression, anxiety, insomnia, posttraumatic stress disorder, and psychological distress among populations affected by the COVID-19 pandemic: A systematic review and meta-analysis. *Psychiatry Res*. 2021; 295: 113599.
14. Sadock BJ, Sadock VA. Kaplan & Sadock's synopsis of psychiatry. *Behavioral sciences/clinical psychiatry*. 9<sup>th</sup> edition. Philadelphia: Lippincott Williams & Wilkins, A Walters Kluwer Company. 2003.
15. Osofsky JD, Osofsky HJ, Lakisha Y Mamon LY. Psychological and social impact of COVID-19. *Psychol Trauma*. 2020; 12: 468-469.
16. Baker FA, Metcalf O, Varker T, O'Donnell M. A systematic review of the efficacy of creative arts therapies in the treatment of adults with PTSD. *Psychol Trauma*. 2018; 10: 643-651.
17. Tomić I, Milić V, Lazić D, Marinković S. Psychological survival in Banjica concentration camp due to inmate creativity. A recommendation to future victims. *Austin Anthropol*. 2019; 3: 1008.

18. Jasiński A. Public space or safe space—remarks during the COVID-19 pandemic. *Technical Transactions*. 2020/020.
19. Bielecki M, Patel D, Hinkelbein J, Komorowski M, Kester J, Ebrahim S, et al. Air travel and COVID-19 prevention in the pandemic and peri-pandemic period: A narrative review. *Travel Med Infect Dis*. 2021; 39: 101915.
20. Zielinski S, Botero CM. Beach tourism in times of COVID-19 pandemic: Critical issues, knowledge gaps and research opportunities. *Int J Environ Res Public Health*. 2020; 17: 7288.
21. Oberlander J. Introduction to "COVID-19: Politics, inequalities, and pandemic". *J Health Polit Policy Law*. 2020; 45: 905-906.
22. Shah SGS, Nogueras D, van Woerden HG, Kiparoglou V. The COVID-19 pandemic: A pandemic of lockdown loneliness and the role of digital technology. *J Med Internet Res*. 2020; 22: e22287.
23. Que J, Yuan K, Gong Y, Meng S, Bao Y, Lu L. Raising awareness of suicide prevention during the COVID-19 pandemic. *Neuropsychopharmacol Rep*. 2020; 40: 392-395.
24. Stefanovic V. COVID-19 infection during pregnancy: fetus as a patient deserves more attention. *J Perinat Med*. 2020; 48: 438-440.
25. Chung JY, Beiss V, Fiering SN, Steinmetz NE. COVID-19 vaccine frontrunners and their nanotechnology design. *ACS Nano*. 2020; 14: 12522-12537.
26. Balakrishnan VS. The arrival of Sputnik V. *Lancet Infect Dis*. 2020; 20: 1128.
27. Garfinkel M, Sansonetti PJ, Pulverer B. Survival of the Wealthiest? *EMBO J*. 2020; 39: e107227.
28. Lavigne SE. The race for a COVID-19 vaccine. *Can J Dent Hyg*. 2020; 54: 107-109.
29. Iserson KV. SARS-CoV-2 (COVID-19) vaccine development and production: An ethical way forward. *Camb Q Healthc Ethics*. 2021; 30: 59-68.
30. Liu Y, Salwi S, Drolet BC. Multivalued ethical framework for fair global allocation of a COVID-19 vaccine. *J Med Ethics*. 2020; 46: 499-501.
31. Reuters. Former enemy Serbia donates COVID-19 vaccines to Bosnia's Muslims, Croats. 2021.
32. CNN. Balkan countries flock to Serbia for Covid-19 vaccinations. 2021.
33. Greer SL, King EJ, Elize da Fonseca EM, Peralta-Santos A. The comparative politics of COVID-19: The need to understand government responses. *Glob Public Health*. 2020; 15: 1413-1416.
34. Zoumpouris V, Goulielmaki M, Rizos E, Baliou S, Spandidos DA. The COVID 19 pandemic as a scientific and social challenge in the 21st century. *Mol Med Rep*. 2020; 22: 3035-3048.
35. Esposito S, Principi N, Leung CC, Migliori GB. Universal use of face masks for success against COVID-19: evidence and implications for prevention policies. *Eur Respir J*. 2020; 55: 2001260.
36. Goldust M, Abdelmaksoud A, Navarini AA. Hand disinfection in the combat against COVID-19. *J Eur Acad Dermatol Venereol*. 2020; 34: e454-e455.
37. Karáth K. Covid-19: Hungary's pandemic response may have been worse than the virus. *BMJ*. 2020; 371: m4153.
38. Eccleston-Turner M, Upton H. International collaboration to ensure equitable access to vaccines for COVID-19: The ACT-Accelerator and the COVAX Facility. *Milbank Q*. 2021.
39. Ferguson K, Caplan A. Love thy neighbour? Allocating vaccines in a world of competing obligations. *J Med Ethics*. 2020.
40. Nhamo G, Chikodzi D, Kunene HP, Mashula N. COVID-19 vaccines and treatments nationalism: Challenges for low-income countries and the attainment of the SDGs. *Glob Public Health*. 2021; 16: 319-339.
41. Chia T and Oyeniran OI. Human health versus human rights: An emerging ethical dilemma arising from Coronavirus disease pandemic. *Ethics Med Public Health*. 2020; 14: 100511.
42. COCONEL Group. A future vaccination campaign against COVID-19 at risk of vaccine hesitancy and politicisation. *Lancet Infect Dis*. 2020; 20: 769-770.
43. Excler JL, Privor-Dumm L, Kim JH. Supply and delivery of vaccines for global health. *Curr Opin Immunol*. 2021; 71: 13-20.