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A Qualitative Study of Pre-Vaccine Decrease of Mortality from COVID-19

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Abstract

More than a year has passed since the appearance of disease called COVID-19 in the world. This disease became the reason for unprecedented measures taken so far, having received the classification of pandemic. The world has faced with pandemics before, but society has not yet taken such unprecedented restrictive measures. The restrictions of not only local but even of global nature, such as the suspension of international flights, various scientific and political events were adopted around the world. Media resources have played a key role in the formation and development of the attitude towards the disease in people. Despite all the depressing news, the facts showed a low mortality rate, which is often ignored by the media. As a result, medical staff around the world have faced psychological health issues among the different groups of the population, especially vulnerable ones such as people with chronic disease and with weak immunity. At present, it is early to talk about the results and outcomes of the pandemic. However, previous year has taught us many lessons and can become a key factor in understanding the role of the media in pandemic times, developing strategies for combating diseases and protecting public health.

Keywords: coronavirus, coronavirus pandemics, COVID-19, media and coronavirus, infodemic, fake-news, coronavirus and social media, coronavirus and internet, coronavirus and healthcare, quarantine, lockdown, coronavirus pandemics and politics, coronavirus pandemics and economics, telemedicine

1. Introduction

COVID-19 pandemic has changed the world. More than half of the planet's population, namely, more than five billion people have been isolated during the last year, changing regular life, habits and thoughts. Most international flights, travels, events and gatherings, sports and cultural programs including World Expo, World Sport Cups, and the Olympic Games have been cancelled, political and scientific events moved to the online format. The global economy has collapsed and prognosis for the next year includes the increase in hunger and poverty. International organisations, national and international leaders could not shade their own weaknesses and disorientation. Wrong decisions, non-justified actions and declarations were made... Being medico-legal expert who used to look into facts rather than rumoured and unproven information, the mortality rate is the first thing that is taken into consideration. According to our analysis of mortality rates in different continents

and countries that have been made from the beginning of pandemic we have seen that panic in the countries, frightening messages from TV screens, media speculations in newspapers have been developing in a similar scenario to aggravate dangers of the pandemic, which is probably more beneficial for certain political reasons rather than economic, scientific, medical or public. Our definite conclusion is that this pandemic is not only medical and biological problem. From other side, our observations shown it may have great value for the world if to take right lessons from its global effects on our future lives.

Thus, the article provides a qualitative analysis of the factors associated with the pandemic in the field of biotechnology and other spheres of life through their reflection in the media.

2. The development of biotechnology as one of the factors of the positive impact of the pandemic

Despite its negative impact, the pandemic primarily gave impetus to the development of biotechnology that ensured creation of effective tools to combat the coronavirus. Biotechnology, in addition to traditional fields such as genetics or molecular biology, is also based on information technology. Computer modelling tools provide wide opportunities for modern biotechnologies. Those tools ensure faster study of viruses, identification of their genome and, as a consequence, development of new testing methods and disease prevention. The innovative biotechnology tools accelerated study of sequence of the new coronavirus genome. As a result of their application in just a few weeks after discovery of the disease [1, 2], its virus genome has been analysed.

Prompt decoding and computer modelling of the virus created conditions for development of express coronavirus tests [3]. Moreover, biotechnologies ensured the development of various types of vaccines against the virus [4] based on different methods. In that context, biotech companies have become a kind of founders in the hope of fighting against the pandemic as they are at the forefront of research to develop vaccines and treatments.

It is the development of modern biotechnology that has led to such a rapid development of various vaccines in such a short time. Considering urgency of the situation U.S. Food and Drug Administration (FDA) has authorised several vaccines for emergency use. Thus, based on clinical research results as of March 2, 2021 CDC information confirms [5–7] the efficacy of the approved vaccines as shown in **Figure 1**.

Although vaccines are the most important tool developed because of the application of biotechnology in the fight against coronavirus, their effectiveness at the initial stage caused a heated discussion in the media. Moreover, their use and side effects have become the subject of massive misinformation and rumours among population. In order to avoid similar phenomena in the future and to help

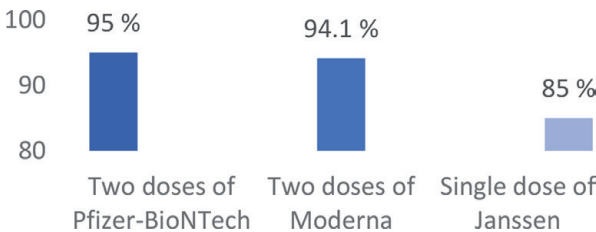


Figure 1.
Efficacy of the CDC approved vaccines. Data of 2 March 2021.

biotechnological companies and states to correctly develop their strategy for working with the media, we consider it necessary to analyse information and most common media cases related to the pandemic in this context.

3. Coronavirus and the role of the media

Today, computer technology has become an integral part or even a fundamental tool for scientific research, especially in high-tech research such as biotechnology. However, development of information technology is inherently associated with the Internet and media in general. Scientists and biotechnology companies analyse media resources in order to study the social aspects of people's lives and conduct relevant research. Moreover, media resources such as social networks create opportunities not only for the communication of scientists, but also for identifying trends in public discussions and sharing their research or developments. Thus, the Biotech-careers web-resource conducted an analysis in their database and found 109 companies in 364 localities working on COVID-19 as of April 06, 2020 [8]. We presume that those numbers are increasing. During the pandemic, reports on biotechnology found wide media coverage but what did the pandemic represent for society?

The COVID-19 pandemic has become one of the largest threats facing humanity. However, can we say that it was the disease, fight against which was worth such unprecedented measures as complete lockdowns, the cancellation of all public events, depriving people of such a basic right as freedom of movement? What became the hallmark of the disease besides the fact that it was a new strain of the coronavirus infection?

The humanity has already faced epidemics and pandemics earlier. The diseases such as tuberculosis, smallpox, the virus called "Spanish flu" killed thousands of people. In our opinion, in addition to purely medical and epidemiological factors, the key factor that distinguishes COVID-19 is the role of the media. In contrast with the 19th or early 20th centuries when there was no Internet, social media, so many TV and radio companies, today the number of such sources of information is innumerable. The era when people had to wait for a new issue of the newspaper to get information is outdated. Today, thanks to media resources and the Internet, information is updated every second. The presence of social networks contributes to the prompt dissemination of the information. However, it is often distorted or even "overgrown with rumours" on the Internet.

Various viruses coexist with humanity. For example, although the influenza virus is activated every year, lockdowns and other global restrictions are not enforced. Successful fight against seasonal flu is a prime example of biotech progress. Experts have learned how to cope with the influenza virus [9], which infects thousands of people every year. However, modern biotechnologies allow not only to cure people from influenza, but also to prevent its spread.

Because of enforcement of the measures to combat COVID-19, all areas of life were paralysed. Even biotech companies faced difficulties in their research due to lockdowns and morbidity risk among staff.

Closing the borders of states, stopping civil interstate flights and other measures led to many social and economic problems. Thus, the Azerbaijan citizens who used to travel abroad for the medical tourism purposes had to postpone planned procedures because of the closure of borders and the suspension of air traffic for some time. Although restrictions on air traffic had a positive effect on the environment, it is difficult to assess the balance of harm and benefit when comparing the social activities, economy and the environment. Restrictions and associated social,

economic problems, depression and increased anxiety in society, the violation of all social contacts, when people were afraid or prohibited from meeting with relatives and friends, were weighed against the risk of spread of the disease. Therefore, it is difficult to assess the benefit of restrictive measures as both economic and medical areas play the key role in life of the world community. However, there were also exceptions. The Republic of Belarus has not implemented the restrictive measures and, nevertheless, the mortality rate in the state was “one of the lowest in the world” [10]. If in Azerbaijan throughout all the investigated period of the last 11 months mortality rate was not above 1,5%, in Belarus this was less than 0,7%. If today in Azerbaijan we have about quarter of million contaminated during last year COVID patients, Belarus had slightly more for a few dozen thousands people, but mortality was twice less. Moreover, this is in a situation, when they did not close schools, universities, stadiums, public transport, nothing. They made a military parade of Victory Day 9 May 2020, presidential elections, had millions on the meetings and demonstrations after but COVID did not appear as frightening as in the rest of the world. Belarus and Azerbaijan both have similar geography and population about 10 million but management of pandemics were very different, and they succeeded even more than Azerbaijan and the rest of the world. In one of our past articles, we mentioned that the main reason was that the genotype of neither Azerbaijani nor Belarus was a target for COVID-19.

Talking about social and other factors, we return to the role of the media. What was their role and remains today? At first glance, the media simply broadcast the latest summaries of information about the disease and its mortality. The provision of statistical information, which often did not represent any value for the average reader, caused panic and fear. Therefore, it often had more negative than positive significance. Obviously, in pursuit of the rating, the media often published data on the most rare consequences and symptoms of the coronavirus infection [11, 12]. Although the experts later explained the reason for the incident, rumours continued to spread, especially on social networks and telephone voice messengers. The example of such misleading information is the change in skin colour from the coronavirus. Publication and replication of such incomplete information to attract visitors is an example of the so-called “hype” [13]. People reading such headings and sometimes without even opening the whole article begin to panic and spread this information.

3.1 “Infodemic” – new realities

Information resources on various platforms both at the beginning of the emergence of a new virus and today are full of headlines that “the world will no longer be the same” [14]. Many new terms have appeared during the pandemic. They either did not exist before or were not widely used. Terms such as “fake news”, “lock-down”, “covidiot”, “doom scrolling”, etc. entered our daily life. Another example of such terms is “infodemic” [15]. In our opinion, this word most clearly shows how large-scale the flow of information associated with the new virus has become. This term, highlighted by the WHO, described the unfounded information, which does not reflect the truth. It includes panic news and in some cases concealment of the essence of the information, rumours, and conspiracy theories aimed only at misleading the society. Human beings tend to believe and share alarm warnings. Such information in addition attracts more readers, which is of higher importance for the media resources. That became a key factor of the development of infodemic.

Often, the official media unintentionally sowed panic among the population, reporting on the upcoming lockdown, disinfection, etc. Thus, such panic gripped the society in Baku, as in other cities of the world, during the announcement of the

complete lockdown [16]. People rushed to the markets buying almost everything after hearing such news [17]. Although full lockdowns in Baku lasted no more than two days, people bought several times more bread than usual. Society affected by the impact of the panic experienced as a result of the unexpected announcement of the news about the restriction exaggerated by rumours that flooded social networks and voice messengers have only fuelled peoples' fears. On the contrary, along with panic and socio-economic tensions, so-called memes or funny pictures about the coronavirus [18] were also spreading on the Internet. Of course, this does not mean that we should not take the virus seriously. All medical advice must be followed, but one must not be afraid. In addition, even if in social isolation, we should do it without fear. We should strictly follow personal hygiene and distancing but not fear.

A lot of information, which was often fake, had a detrimental effect on both the psychological health of people and hindered an effective fight against the pandemic. People, left in complete isolation, were forced to search for information on the Internet in order to understand what was happening, how to protect themselves from the virus. Given the high interest in the subject matter, the unscrupulous media, accordingly, published and updated information, which did not always reflect reliable data, at lightning speed. Regular users who did not have in-depth knowledge of the topic and were unable to distinguish scientific data from rumours started to panic at such fake information. People prone to depression, who are in chronic stress, suspecting they have a coronavirus, lost their ability to adequately assess the situation. A large number of news, often-fake ones, about the coronavirus, and their even greater spread on social networks, indicate that the criticality of information perception in times of turmoil decreases sharply. This is what the mass distribution of infodemic is based on.

Cybercriminals on the Internet have also contributed to the increase in the scale of the infodemic. Thus, they created hundreds of so-called bad bots [19]. These programs, imitating the behaviour of a real person, spread deliberately false and misleading information. However, during the pandemic, positive bots created by official structures served to provide help. Thus, a bot launched in Azerbaijan [20] allowed people to check themselves for the signs of the coronavirus infection.

However, is it right to say that the pandemic was accompanied only by false news? It is not only the information itself that is very important, but the context in which it is presented and its emotional colouring. Thus, national media in all countries of the world, as well as global media, began to publish "shocking" data on death toll from the coronavirus. Media headlines were mostly representing data on negative facts about the coronavirus. In this context, wasn't it a manipulation of readers aimed only at increasing the "clickability" of the title? It is obvious that the worse the news about the disease, the more readers it will attract. Haven't people before that die of AIDS, cardiovascular diseases and other diseases? How important is the context of presenting information? Infodemic, when information or misinformation spreads virally, like the spread of the viral infection itself, has become the result of the work of the media and social networks. Pure statistics, even if it concerns mortality, can be frightening or neutral depending on different contexts [21]. 3000+ deaths from COVID-19 in Azerbaijan during 12 months repeated everyday from TV channels impact deleteriously to the mental health of the people and make them panic. This is natural for public to be afraid. However, as forensic experts in Azerbaijan we know that the average mortality of the country about 60 thousands deaths in the past year makes three thousands less than even 10% of mortality. Is this a justified reason for things we observed in last year? We do not think so. Majority of people continue to die from traditional diseases and most of dying COVID patients are also dying from own main diseases aggravated

by concomitant coronavirus infections, which was always happened in past when influenza made complications for such categories of diabetic, cardiac, oncology, hepatic and renal patients.

Literally recently, from a historical point of view, humanity has been fighting epidemics such as “SARS (2002, 10% of deaths from those infected), avian flu (2003, 50% of deaths from those infected), MERS (2012, 35% of deaths from those infected), Ebola (2014, 40% of deaths from those infected)” [22]. At those times, the media was also filled with information of a frightening nature. However, humanity coped and literally until 2020, people lived a normal life, and only virologists and epidemiologists spoke about viruses in everyday life, to a lesser extent - representatives of other medical specialties.

Aimed at creation of sensation impressions and mass distribution, and in the case of social networks to get more shares, likes, views, journalists and bloggers, ordinary users, knowing nothing about medicine, or knowing at the level of the non-professional, write about the pandemic, the virus and even give treatment advices. How ethical in that context is writing of news by a person who does not have professional education in this area? What shall be the criteria? What medical, epidemiology and other information can and cannot be published by a non-professional? We usually do not look into the education of the author of news but is it important in the era of pandemics? There are no definite answers, since everyone is entitled to the right to have personal point of view. From a legal standpoint, freedom of thought and expression of will is an inalienable human right. However, if a person disseminates knowingly false information, gives advice of medical nature without a licence, then personal opinion becomes an example of violation of the law. If the advice caused harm to health, then this action entails criminal liability. At the same time, we know many examples of medical errors done by professionals [23]. Therefore, it is impossible to mark the availability of medical education as the standard for authors writing or speaking about the pandemic. We can conclude that the coronavirus pandemic has led not only to medical but also to many ethical and legal issues in society as well.

3.2 Information about the virus: myths and facts in the media

If earlier the society experienced a lack of information, now there is a surplus of it. A person is simply not able to assess the scale of the incoming information. Thus, the query “coronavirus” in the popular search engine Google as of mid-February 2021 gives out about 2.220 million [24] search results. Publication of such a large amount of information is often accompanied by a decrease in its quality. Unfortunately, in this case we have to rely on the search engine and hope that it will show the most truthful, complete and interesting information in response to our request. Most people in a fast-paced world have neither the time nor the energy to browse through a large amount of resources. In the old days, people went to libraries, where there was a large, but limited number of sources. Today, their number on the Internet is simply physically incalculable.

In times when only government agencies were the sources of information, it was possible to trace its author and purpose for which the publication was made. It is clear that at all times the media are always engaged to some degree. It is difficult to say, in our opinion that the media is independent when they have sponsors thanks to which they actually exist. However, there are state and large private media holdings committed to publishing clear information in order to maintain their status as a reliable source. In addition, even in the event of an error, they tend to publish an immediate rebuttal. Nevertheless, even they can hardly be called completely independent. Rating and audience coverage are also important for them.

In the context of the coronavirus, many types of media, both private and public, have sought to convey information as quickly as possible. However, if the “prestigious” resources that treasure their name gave out only official information, then the rest of the media, guided only by attracting the audience, often published an outright fake. Often, the media, referring to famous doctors on their behalf, published information that did not belong to the author at all. What the author indicated either as possible or researched was published as accurate information.

Spreading of false information (or so-called “fake news”) has also become a serious problem. Such news are distinguished by their manipulative nature [25]. Often the authors of publications publish them not by mistake but purposefully. To attract the attention of the population media especially online publications for which traffic is especially important, often referred to the unconfirmed or even false information contributing to its spread. Misleading information can be related to both the disease itself and the methods of its treatment. Thus, information about folk remedies and methods of disease treatment, with the protocols for the use of alternative medicine, which often only worsened the patient’s condition, has filled the Internet.

Lack of medical knowledge and panic among politicians contributed to the dissemination of such information by the media at the initial stage of the emergence of a new virus.

Often, even before the confirmation of the effectiveness of the drug or treatment method and protocol, the media began to spread information about it. Thus, at the initial stage of the pandemic, there were reports of the possible efficacy of certain drugs such as antimalarial one. Media resources began to replicate information about this medicine; even some famous personalities claimed its effectiveness [26], which further increased the public interest. Based on unproven information, some people began to use this drug without a prescription, which led to serious side effects, and in some cases even death [27]. Only after clinical trials, scientists and medical professionals concluded that the drug is not only ineffective but can be even dangerous for use by certain parts of the population [28]. Nevertheless, unfortunately, despite further denial in the media, there was already data on mortality caused by the use of the unverified information. However, at the initial stage, in early 2020, COVID-19 was a new type of disease for the medical and scientific community. This significantly complicated the work of doctors and less of the media. In the beginning, when there were no approved and proven effective treatment protocols, doctors had to verify any information empirically, that is, to use all available treatment options to save lives. However, the media, in pursuit of the rating, immediately publishing these data, albeit even if unintentionally, misled people.

Since the appearance of a new type of virus, many theories about its origin began to appear on the Internet. At an early stage, various rumours that have spread on the Internet, in the absence of scientifically proven facts caused distrust among people [29]. This fact largely contributed to the emergence of conspiracy theories. The so-called conspiracy theories put forward different ideas massively replicated in the media. In addition, even when experts denied the causes stated as the reason for the emergence of the virus in theory or the resources themselves published a refutation, people continued to spread information through social media networks. The most popular was the theory of the spread of the virus by the communication stations, which led to dozens of cases of the destruction of stations by the population [30]. Spreading of such misleading information forced internet resources such as popular social media [31] to mark the information about the coronavirus as unverified and in some cases to even delete or block it.

In response to mass disinformation the WHO as well as UNESCO, European Commission and other organisations have created special web platform such as

“mythbusters” to in an understandable form with the help of specialists to debunk each of the myths and provide scientifically based information [32–34].

We think reality we have now and experience we gained in last year could make us taking very positive lessons as well: decrease of mortality started in the second half of the last year and continued to present levels even in pre-vaccine era, 80% of contaminated population had mild course of disease, more than 90% of population has recovered, young people and children were ill much rare than the older age groups, panic took more people to the death rather the disease itself.

3.3 Vaccination and role of the media

Since the very appearance of vaccines in the media, unverified and often false information about vaccines began to spread. As well as it was with the coronavirus itself. The most widespread conspiracy theory, of course, was the “chipping”. This fake appeared at the beginning of the pandemic and explained its appearance as the desire of certain forces to microchip all of humanity by means of vaccination.

The efficacy and safety of vaccines has been the subject of debates. Although vaccines appeared just a couple of months ago, the media were already filled with information about mortality after their introduction [35]. Unfortunately, mortality from the vaccine as a reaction of the body (anaphylactic shock) is quite possible, even in the case of the administration of long-used, well-studied vaccines.

COVID-19 vaccine has recently appeared. Due to its urgency, it has not passed long-term clinical trials, which usually take 2–3 years. However, preliminary data made it possible to speak about their effectiveness and safety, which gave the WHO reason to approve the first yet vaccine.

The media circulating conspiracy theories and other fakes earlier are now publishing news about the need for vaccination. An interesting fact is that even now the Internet is filled with information about vaccines’ side effects, which alternates with a call for vaccination. The media, with their fast-changing and sometimes diametrically opposed news, is often misleading their viewers and readers. Many people, reading about mortality from coronavirus, want to be vaccinated immediately, while others, reading about its side effects, start to panic.

Publishing only information on side effects and mortality from vaccinations, the media rarely covers how many people were successfully vaccinated. How many and at what level developed antibodies after? That is, one gets the impression that the media are not engaged in providing information, but in only attracting an audience or so-called hype.

It is also necessary to note the inadmissibility of discrimination against people who refuse vaccination. Coercion violates a constitutional human right and right for autonomy and dignity. Moreover, for some people, vaccination is contraindicated due to the medical reasons, such as allergies to its components. However, media are actively broadcasting information about “covid passports”, manipulating peoples’ fears.

Azerbaijan is the first country in the South Caucasus region and is one of the first in the world that ensured vaccines’ delivery and has launched vaccination on 18th of January 2021. Vaccination is implemented free of charge for the citizens and on voluntary basis thus protecting the autonomy of decision-making.

The Cabinet of Ministers approved the “Strategy of vaccination against COVID-19 in the Republic of Azerbaijan for 2021-2022” on 16 January 2021 by the Order No. 48 s. The phased vaccination strategy implemented in the country prioritises the elderly and medical workers.

The vaccines approved so far by the CDC are not yet available in Azerbaijan due to the lack of sufficient amount of them at the manufactures and high demand.

However, the country has contributed \$21 million [36] to the COVAX [37] initiative and supports all international activities in the fight against the coronavirus [38]. Moreover, as the delivery of vaccines within the COVAX is still expected [39], Azerbaijan has already purchased 4 million vaccines of Coronavac from China [40] to start the vaccination early. The procedure takes time because it includes an examination of those wishing to be vaccinated. For check-up and vaccination purpose, the State Agency for Compulsory Medical Insurance has launched a new electronic service called “COVID-19 vaccine appointment” [41]. Vaccinated citizens will be issued an electronic certificate in case of need a vaccination document when travelling abroad.

3.4 Social networks and phone messengers as a source of disinformation

Today, in addition to official state and private information companies, social networks have become a great source of information. Conceived to create a means of convenient communication and exchange of information between people, social networks have become independent sources of information. Although most of the official media, government officials and various international and other structures have official pages in the networks, in addition to them, there are millions of other pages. Some pretend to be original, creating fake profiles on behalf of the official or structure. Others share information at the rumour level, creating a false impression of credible awareness.

Smartphone messengers posed a special threat in this sense specifically when messages were sent from person to person, and the author could only be identified by involving law enforcement agencies. Thus, one of the most “egregious” fakes, widespread in Azerbaijan, was a voice message about the alleged disinfection of the entire country from a helicopter [42]. Unfortunately, doctors themselves often participated in the spread of such fakes, as they later explained “under the influence of panic” [43] or, more horribly, for the sake of joke [44].

During the pandemic, Azerbaijan had to introduce fines, administrative or criminal liability for spreading rumours about the coronavirus [45]. Of course, doctors, like the rest of the population were in fear and stress during the peak period of the pandemic in the country and in even more risk of being in constant contact with patients. However, the role of the media, especially unofficial ones that disseminated such information should not be underestimated. In the case of instant messengers, the situation is even more complicated for a number of reasons. First, they guarantee the confidentiality of the information sent through their platform. Secondly, personal correspondence is not an official source of information and only expresses the opinion of the author, to which everyone is entitled by law. Moreover, since the information is private it does not imply distribution. However, unfortunately, the pandemic has shown that information can be disseminated through instant messengers even faster and on a larger scale than through publications on the Internet. For example, some messengers had to mark frequently sent messages as a possible fake or even prohibit their forwarding [46]. However, these restrictions are sometimes ineffective. The user can not only simply forward the message to others, but also write a new one, referring to initial information as “heard” one, “it was said that...”. As a result, the original message is further distorted and overgrown with rumours. There is no responsibility of messengers in this context. It is impossible, since they do not break the law by their work. They only do what they were created for, namely they represent the means of communication.

People who use social media or phone messengers should understand their responsibility by sending comic messages on such a serious topic as the coronavirus. In addition, it is the personal responsibility to trust rumours or not. The only

possibility to protect our safety in this regard is to verify all the incoming information with the official sources, such as the state ministries' websites and think critically about the news we get.

3.5 COVID-19: role of media in the positive effects of the pandemic

Along with high uncertainty and anxiety, the pandemic has created conditions for development in some areas. As a result of total lockdown the digitalization of society has accelerated. People were forced to spend more time on the Internet. Many workers were transferred to the so-called remote job. Online shopping began to develop in those countries where it was not popular before. Even areas that previously seemed impossible online have begun to adapt to the new environment. Thus, online pharmacies began to appear in Azerbaijan, school and university studies also switched to online training, and special training platforms were launched. Telemedicine has started to be developing.

Online commerce and marketing are the areas that have benefited most from the coronavirus-related restrictions. Clothing manufacturers often used the coronavirus theme. Advertisements for T-shirts with various inscriptions and images on the topic of coronavirus appeared on the Internet. Some companies have supported healthcare [47] by producing medical equipment, which was also a good marketing strategy.

Although internet commerce has grown rapidly due to the pandemic, it is difficult to say that it will permanently eliminate shopping malls, at least not in the next decades. Hiking to the malls often has nothing to do with shopping. People, especially the youth, went to shopping malls, which usually have restaurants, cinemas, and a lot of entertainment such as bowling, to spend their leisure time and meet with friends.

The field of telemedicine is perhaps one of the few that has evolved during the pandemic. Today it is still too early to talk about general surgical interventions that can be performed remotely via the Internet (although such experiments have been implemented already [48]). However, telemedicine in today's conditions has become a real salvation for both patients and doctors. First, patients could save the time they usually spend travelling to the hospital. Secondly, the doctor and the patient were both protected from possible infection, since often people themselves did not even suspect that they were infected (the so-called "asymptomatic patients"). In addition, in some cases, the patient does not need a real examination, but a consultation, an adjustment of the treatment course. The psychological effect is also important when the patient turns to the doctor "to calm down his fears". In the case of the field of psychology, telemedicine was easily possible, and it did not lose its meaning either. Since in psychological practice the factor of communication prevails and does not require physical contact such as, for example, in the case of traumatology.

4. General information about the impact of the disease in Azerbaijan and around the world

The coronavirus pandemic is a unique phenomenon. Right after the emergence of the virus and information from China, people around the world were locked-up in their homes. Cities and streets became empty. The world community divided into groups of those who feared the new virus and those who did not believe in it. Fear changed the world. Politicians had to enforce restrictive measures to create a sense of security among citizens. Moreover, the population blamed politicians who did

not act. However, there was also another part of the population that was left without income because of restrictive measures, whose business went bankrupt. On the contrary, they wanted the restrictions to be lifted as soon as possible. Many people came out to mass demonstrations against the mask regime and other restrictions in such big cities such as London, Berlin, Madrid, Amsterdam [49–52].

Comparative statistics analysis for 9 months (March 2020 – February 2021) shows more than two fold growth in morbidity and mortality in the world. Coronavirus cases at the end of February 2021 almost doubled compared to May 2020 (about 112 million compared to more than 5 million) [53]. The coronavirus death toll also increased significantly. Thus, for the mentioned period it has increased from 351,886 in May 2020 to more than 2 million 400 thousand deaths to date. However, recovery rate also has increased indicating that more than 87 million or about 80 percent of patients have already recovered [54]. The above data give us reason to believe that most of the people currently undergoing treatment will fully recover. 99,6% of those who are active cases now have a high chance to be recovered. So, our observations of global mortality rate being 6–7% in early months of March – April, went down to 5–5,5% in May – June, then to 4% in August and to 2,2% from the fall of the year till start of the vaccination. This says a lot. So present mortality rate at 2,2% is not a result of vaccination but this is result of natural processes, which can be scientifically explained or not, but this is a fact which all of us should accept.

The disease, which was classified as the pandemic by the WHO, which affected more than 100 million people in one year has been also registered in Azerbaijan. At the beginning of January 2020, when there were no cases of infection among the population, epidemiological and overall situation in Azerbaijan was not so tense. Even before the first officially documented coronavirus case, the authorities have started the development of the antiviral measures. These measures included the adoption of the Action Plan to prevent the spread of the new coronavirus disease in the Azerbaijan Republic, and then the creation of the Task Force under the Cabinet of Ministers (Task Force or Operative Headquarter under Prime-Minister) to combat coronavirus [55]. However, the escalation of the situation in the media made the situation worse. Global and local media resources covered information of a purely medical or biological nature. This information was not familiar for the average reader, but aggravated fear in society.

The first case of the coronavirus infection was registered at the end of February 2020 in Azerbaijan [56]. The shocking news from other countries by that time have already scared people. Subsequently, after the first death case that followed in March [57] social situation deteriorated. The massive information flow, which was accompanied by frightening statistics about the rapid spread of the virus and lack of treatment of the unknown disease filled local media. The further introduction of quarantine measures led not only to the deterioration in the emotional state of people, but also disrupted the work of almost all areas.

Throughout the year, easing and tightening of the quarantine regime have changed alternately several times, that had a negative impact on the psyche of the people and the economy of Azerbaijan. Thus, according to the latest data, the state spent 2 billion manats (local currency, 1 USD = 1,7 AZN manat) to fight the coronavirus in the country in 2020 [58]. The imminent recession in the economy, business activity, tourism and other spheres negatively affected the economic condition of people. As a result, the income of the population has significantly decreased or stopped altogether. Although the state has provided financial support [59] to the citizens and entrepreneurs [60], people accustomed to the certain level of incomes, who took out a flat or a bank loan on a mortgage, found themselves in very difficult circumstances. The most difficult situation was observed in the tourism, restaurant,

and entertainment sectors. Under the conditions of quarantine measures, their work was either prohibited or significantly restricted. Consequently, the economic factor has become an additional reason for the deterioration of the psychological health of the population. Moreover, under the conditions of the strict quarantine, restrictions and even ban to leave home were applied in the country [61].

Implemented during the quarantine time limit for leaving home [62] negatively affected people's everyday life. In fact, people were limited to outdoor walks. The time restrictions on leaving the house forced people to make a choice between visiting, for example, a bank and taking a walk in the park or even doctor visit.

The ban on the work of gyms and admission to parks has become an additional fact of the aggravation of not only the physical but also the psychological health of the people. Accustomed to a sports lifestyle were limited even to visiting parks and the sea. Morning jogging along the embankment was allowed only in compliance with epidemiological measures, such as wearing a medical mask, which questioned the benefits of such a run. In our opinion, in Azerbaijan, where the summer season is very hot wearing a medical mask during that times was more harmful than beneficial especially while morning jogging. Wearing a mask limited calm breathing, caused shortness of breath and additional sweating. In general, from a medical point of view, the value of wearing a mask in the hot summer season, weighed down by the high levels of humidity that is observed in the most parts of the country, from our point of view, are not just controversial, but rather negative. Thus, sweaty masks, in conditions of poor air exchange during summer season, often absent or very weak wind attracts bacteria more than protects health. Such measures had an extremely negative impact on both the physical and emotional state of people. Moreover, unfortunately, masks were not distributed free of charge on a massive scale to the country's whole population. Therefore, some people ignored the need to change the mask every 2 hours, and there was no point in it due to the high air temperature, which some days was above 40 degrees Celsius, and high humidity.

Even during the hot summer months, within the framework of quarantine measures people were deprived of the opportunity to visit the beaches. Access to the beaches was opened only at the beginning of August when the beach season in Baku was already ending [63]. Moreover, the opening also took place subject to the necessary epidemiological measures [64] such as social distance between beach loungers and limiting the number of people on the beach. To this end, a website was created where people could book their place in advance on the beach and estimate how many people are there.

Places of religious worship were also closed in Azerbaijan during the tough quarantine as well as in many countries. However, people who were already in the stressful state and used to find peace only in such places through prayer were deprived of this opportunity. The pilgrims were deprived of the opportunity to perform the Hajj [65], the devout deprived of carrying out religious rites in relation to those who died from the coronavirus. The closure of churches [66], temples, mosques and other places of worship at certain times has been implemented around the world. Unfortunately, it is difficult to maintain social distance in places of worship. There were also recorded cases of mass infection in such places [67, 68] that ensured the restrictive measures. Nevertheless, such restrictive measures have created an additional burden on the psychological health of people and have disrupted the usual way of life. The mosques remain closed even at present. Moreover, the closure of the religious sites while restaurants are open is also causing debates in the society.

We believe that one of the unjustified measures taken in the fight against coronavirus in Azerbaijan as well as in many other countries was the disinfection of the streets. The chemicals used for the disinfection were further absorbed into the soil, disrupting the ecology and harming biodiversity. Moreover, these substances posed

a particular threat on people's health, especially of those suffering from allergies and lung diseases. Therefore, both from an environmental and a medical point of view, this measure caused more damage than benefit. Large financial resources were allocated for its implementation, which in the conditions of the economic downturn was spending that could be directed to health care needs. An additional, albeit not so important, negative factor of disinfection is the inconvenience of the population. Often people were advised not to leave the house during disinfection.

From the epidemiological point of view, mentioned restrictive measures might be justified if they made sense in terms of reducing the rate of increase in the incidence. However, the statistics, unfortunately, show the opposite. Moreover, the negative influence of the lack of sports activity and walking in the fresh air, the importance of vitamin D produced by the body under the influence of sunlight is widely known. That is, the restriction on walking in the fresh air led to stress and an even greater weakening of natural immunity, which is so important in the fight against the virus.

Restrictive measures in connection with the coronavirus in Azerbaijan have been further tightened as a result of the introduction of martial law at the end of 2020. Coronavirus disease during the war has become an additional burden on the health-care system. The outbreak of the Patriotic War or the Second Karabakh 44-day war [69] at the end of September created tension in society. News reports from the front line were combined with statistics on the spread of coronavirus infection. Moreover, the restrictive measures have been further tightened in connection with the introduction of martial law in the country. The country's health care had to solve a difficult task of allocation of resources between the needs of the front and coronavirus hospitals. In this respect, this period was especially difficult for doctors. Consequently, the health care system was overloaded during this period.

The Task Force significantly weakened the quarantine regime, however, has not completely lifted it as of February 2021. Thus, a number of restrictions such as the necessity to wear medical masks, large shopping centres and metro remain closed, public transport does not work on the weekends, will remain valid until April 2021 [70].

The coronavirus emergence also gave impetus to the development of domestic healthcare in Azerbaijan. Thus, foreign experts from China, Russia, Italy and Cuba were repeatedly invited to the country to exchange experience and help to fight coronavirus [71–74]. For the first time in the country, modular hospitals were opened [75]. Factories for the production of medical masks and even disinfection tunnels [76] for domestic use and export have been launched.

As of February 2021, statistics on coronavirus in Azerbaijan show about 80 percent recovery [77]. At present, some patients are still in hospitals, some are being treated at home, so it is difficult to give a final figure yet. However, based on one-year observation we can assume that the final death rate from the disease in the country will be low and not more than 2 percent.

Not only Azerbaijan experienced coronavirus-related restrictions. Worldwide unprecedented control measures have been taken. Thus, all international sporting, cultural and scientific events have been cancelled. Many events such as international chess tournaments and even political meetings with the participation of state officials were held in the online format.

Restrictive measures of unprecedented scale and often-conflicting media coverage may have resulted from the lack of timely action by the WHO [78], which declared pandemic and gave appropriate medical advice to the member-states quite late. Were these measures justified? Experts have yet to figure it out. At the initial stage, when the world was gripped by panic due to the unknown type of virus, such measures may have been necessary. However, by the middle of 2020, their

destructive side in relation to the economy and the psychological health of people became clear. A similar situation and restrictive measures were observed in many countries of the world and for now, people still do not have the opportunity to return to their usual way of life. For now, continuation of quarantines around the world, restrictive measures when the coronavirus infection has already been studied and vaccines have been developed and made available, is questionable and causes controversial ideas among the world community.

5. Conclusion

Despite all the restrictive measures taken in the world, the pandemic did not stop, and only a year after its emergence the European Commissioner admitted that “the borders do not prevent the coronavirus” [79]. Unfortunately, society has gone through practically a halt in all social life. It has been deprived of the opportunity to visit other states for more than a year. However, today there is no decision to completely lift restrictions by all states. Some countries announce quarantines even in 2021 [80]. The Internet today is filled with “predictions” about how the world has changed, that it will no longer be the same again after COVID-19. Positive ideas are replaced by negative ones and vice versa. All this information affects the psychological state of readers. For some, coronavirus is depressing, for the others it has opened up new opportunities and ideas. “What will the world be like after...?” Journalists and representatives of other spheres argue. A little over a year has passed since the emergence of the new virus. What can we conclude for today? First, the impulse that the virus gave to the development of biotechnologies and medicine. In just a year, several effective vaccines for coronavirus appeared at once in particular thanks to the development of biotechnology. Have we encountered such lightning-fast vaccine development before? Perhaps, the developments scientists have launched today will give positive results for medicine in the future. Despite all the seeming global changes, if we remove the noise created in the media, then nothing has essentially changed. At each stage of human development, one can note the events that “changed” life. Thus, “Spanish flu” has led to the death of millions of people. At that time, it seemed that society would not return to normal life. Nevertheless, humanity coped with the disease and continued its development.

However, we consider the role of the media to be the most important aspect of the pandemic. Media resources are the most important source of information. We have witnessed how misrepresentation of information or its deliberate distortion can harm society, how it affects psychological health. Nor should the role of the state be underestimated in this regard. Politicians, heads of states are interested in the development of society, elimination of threats and maintenance of public health. However, inappropriate or unnecessarily strict measures can sometimes only exacerbate the situation. In this context, a well-coordinated and close cooperation between representatives of the health system, scientists and the media is necessary. State should not allow the spread of fakes, or vice versa, withhold information. The average citizen cannot and does not have to be a scientist to understand a situation. Moreover, the main task of the media is to convey reliable information not through scary headlines, but through proven science-based information. Oftentimes, politicians or lawyers with no medical knowledge make decisions that are medically unfounded. However, there are also opposite situations, when the opinion of a specialist is expressed in the media, but it is so full of terminology that it is not clear to readers or viewers.

From a historical point of view, the significance of the pandemic in our opinion should be assessed as a unique experience, thanks to which people got the

opportunity to re-evaluate approaches to the digital transformation of society, rethink its economic, socio-political, ecological fields and outline the main conclusions about the priorities for the further development of humanity.

For Azerbaijan as well as other countries, it is necessary to develop popular science journalism. Such journalism should research on how to balance the information flow during such a hard times as a pandemic. It is necessary to conduct an objective assessment of media work, effectiveness of healthcare management, identify its weak sides and develop new strategies. The organisation of the healthcare system should ensure its preparedness for extreme situations such as pandemic.

We hope people will not face such pandemics in the future but we – the world community must be prepared for that and do not let panic destroy our lives.

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'Biotechnology to Combat COVID-19' is a collaborative project
with Biotechnology Kiosk

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