Rise of Conspiracy Theories in the Pandemic Times

Elżbieta Kużelewska1 · Mariusz Tomaszuk1

Accepted: 18 May 2022 / Published online: 1 July 2022 © The Author(s), under exclusive licence to Springer Nature B.V. 2022

Abstract
COVID-19 pandemic occurred as an unexpected experience affecting all countries around the globe. In addition to the obvious health, economic and political effects, the COVID-19 pandemic triggered immense changes in the social spheres. People and institutions were forced to adjust to the new circumstances, change habits and move most or all of their activity online. In the completely virtual world, pandemic became a fertile ground for the bloom of the conspiracy theories already existing, but struggling for the global attention. The aim of the paper is to present three main conspiracy theories rapidly gaining popularity during the pandemic (the QAnon, anti-vaccination movements and anti-5G movements) and to analyse how they developed since the pandemic had been announced. In particular, the rising activity of the representatives of the movements will be analysed, as well as its acceleration in connection with pandemic and the resulting influence on social and political life. Finally, the paper will try examine whether the rapid development of conspiracy theories within societies has had any relations to the level of trust towards government-made decisions. The thesis being verified here is that pandemic accelerated the development of conspiracy theories due to the diminishing level of trust towards governments operating in the most difficult period in recent history. There are variety of reasons for the belief in conspiracy theories and they depend on the specificity of the theory and specificity of group of people it originates from. In general, it can be noted that all kind of conspiracies are developed by either (1) people who actually believe in them and are sharing them with good intentions (to warn other about the dangers hidden behind certain actions or institutions) or (2) malignant individuals whose aim is to discord or discredit an opponent or critic or, alternatively, distract attention from misconduct or lack of competence.

Keywords Conspiracy theories · Disinformation · Misinformation · COVID-19 · The QAnon · Anti-vaccination movements · Anti-5G movements
1 Introduction

COVID-19 pandemic occurred as unexpected experience for whole world, more or less affecting all countries around the globe. Despite the obvious health effects, the COVID-19 pandemic also triggered political and social changes. People were forced to modify their habits, move most of their activity online, sometimes all institutions of particular kind (such as cultural institutions) started to function exclusively via Internet [40, 51]. Unprecedented challenges have led to positive social results (increase of digital skills, appreciation of on-line work efficiency, access to cultural resources in virtual dimensions) that hopefully will continue to develop, but the negative effects of those challenges have left us with enormous efforts to fight them and repair what has been destroyed. One of such negative effects that needs to be examined is the fact that pandemic provided a fertile ground for development of so-called conspiracy theories [19, pp. 3–35; 30, pp. 1–14], which had been active so far, however their popularity started to grow significantly during the pandemic. Within such theories may be found movements as QAnon, antivaccine movement or anti-5G movement. Societies tend to supplement the gaps in the information shared by officials (governments, doctors, other authorities) with ideas which seem to explain all appearing doubts and concerns. Therefore, altogether with outbreak of COVID-19 pandemic we faced the festivities of understatements and misunderstandings. Pandemic turned out the perfect timing for conspiracy’s theories to spread and gather new believers.

Various pandemics and epidemics (from AIDS to H1N1 and SARS), have commonly given rise to rumours and conspiratorial narratives. The COVID-19 pandemic is not an exception. A specific feature of the COVID-19 pandemic has been the proliferation of conspiracy theories on social media, a pattern which began early on in the pandemic [3, 11]. The problem of conspiracy theories or, alternatively called, misinformation has been noted by UNESCO, which defined it as ‘misleading information created or disseminated without manipulative or malicious intent’ and distinguished from disinformation defined as ‘deliberate (often orchestrated) attempts to confuse or manipulate’ [63]. ‘Social media is now increasingly spreading fake news and conspiracy theories. Instead of supporting democracy, it now represents one of the greatest threats: popular platforms are powerhouses that enable misinformation to spread on a massive scale’ [24, p. 112].

Mihalis Kritikos tried to examine early efforts to combat mis- and disinformation regarding the COVID-19 ‘infodemic’ from the perspective of functioning of the democracy [39, p. 369]. According to his research results’, misinformation or conspiracy theories are not just a problem of content, they are rather problem of transmission. Even state officials are able to activate emergency alerts systems across mobile phones and radio to reach the public, no such emergency protocols exist for social media.

The aim of the paper is to shortly present three main conspiracy theories developed during the COVID-19 pandemic: QAnon, antivaccine and anti-5G movements and to analyse their fluctuation. Specifically, the rising activity of the
movements will be examined, together with their connection to pandemic and influence on social and political life. The analysis will also address the issue of pandemic’s impact on acceleration of the researched conspiracy theories’ development and try to answer the question whether the observed rise reveals any relations to the level of trust towards government. The hypothesis being verified hereto is that pandemic accelerated the development of conspiracy theories and that the reason of it is diminishing level of trust towards governments (connected with the crisis of neoliberal democracies) as well as insufficient level of governmental communication towards citizens.

To verify the hypothesis of the study, a critical analysis of the literature was performed and statistics from several leading research centres were used: the Edelman Trust Barometer, the Pew Research Center, Eurofound and the World Bank. Diminishing lack of trust towards governments, especially in European countries and the USA, has been recorded by the Edelman Trust Barometer, which is a worldwide poll. The Pew Research Center reported lack of trust towards US government. The Eurofund was responsible for preparing a unique e-survey on democracy and trust during COVID-19 (living, working and COVID-19) in the EU Member States. The data covered topics including among others trust in institutions and satisfaction with democracy. The data received from the World Bank shows that the world median of trust towards governments has been decreasing during the last few years. The numbers prepared by Jonathan Perry for the United Nations have been also explored. Even though he measured trust in government institutions in the context of economic security, the results fit into the overall context related to trust during a COVID-19 pandemic.

2 What are Conspiracy Theories

According to Encyclopaedia Britannica, conspiracy theory is an attempt to explain harmful or tragic events as the result of the actions of a small powerful group. Such explanations reject the accepted narrative surrounding those events; indeed, the official version may be seen as further proof of the conspiracy [9]. What is widely underlined is that conspiracy theories increase in prevalence in periods of widespread anxiety, uncertainty, or hardship, as during wars and economic depressions and in the aftermath of natural disasters like tsunamis, earthquakes and pandemics. Moreover, the survivability of conspiracy theories may be aided by psychological biases and by distrust of official sources [9]. Literature defines conspiracy theories as explanations for important events that involve secret plots by powerful and malevolent groups [29, pp. 731–742] or as attempts to explain the ultimate causes of significant social and political events and circumstances with claims of secret plots by two or more powerful actors [20, pp. 3–35].

It is clearly visible that pandemic gave perfect ground for development of conspiracy theories as, with no doubts, it is a tragic and difficult period in history and the distrust to decision undertaken by authorities is relatively low (even though the management problems may be explained by uniqueness of the pandemic development). Other definitions state that conspiracy theories are attempts to explain the
ultimate causes of significant social and political events and circumstances with claims of secret plots by two or more powerful actors. While often thought of as addressing governments, conspiracy theories could accuse any group perceived as powerful and malevolent [21, p. 4].

Reasons why people believe in conspiracy theories vary, depending on specific theories and groups of people. However, so far several factors (reasons) making people believe in conspiracy theories have been specified [19, 22]. Among them factors such as psychological factors [37, 69], epistemic motives [65], existential (emotional) [68], social factors [66] as well as political motives have been indicated [41]. It is easy to notice that those factors may have individual (social) character or be strongly connected to political issues [20, p. 6–12]. While discussing conspiracy theories during pandemic, it can be observed that at least some people strongly associate those theories with political life (as the opposition for the official authorities’ narrative or a type of protest against certain decisions, e.g. related to lockdown).

It should be noted that all kinds of conspiracies are developed by either (1) people who actually believe in them and share them with good intentions (to let others know, to warn them) or (2) malignant individuals whose aim is to generally discord or discredit an opponent or critic or, alternatively, distract attention from misconduct or lack of competence [10, p. 15].

3 The QAnon Movement

The QAnon movement is the conspiracy theory probably most intensely connected to politics. The entire movement had originated from the Internet sites such as 4chan, 8chan or 8kun and then spread into social platforms including Twitter or Facebook gathering thousands of believers. The idea started from an anonymous Internet user calling himself „Q.“, who, shortly after settling Donald Trump in the White House, claimed to be a top-clearance military official that would slowly reveal the “truth” about the political “deep state” [27]. Q communicated directly to followers through “leaks” or posts, on the anonymous message boards on the Internet social platforms. Q’s main statements included the following: (1) Donald Trump was working with the American military to combat the “deep state”; (2) Special Counsel Robert Mueller’s investigation into Russian interference in the 2016 presidential election was, in fact, a top-secret collaborative investigation with Donald Trump to indict Hillary Clinton for a number of crimes; and (3) many high ranking Democrats and “Hollywood elites” are secretly under arrest for creating and maintaining an international paedophilia ring [13, pp. 15–16].

Unfortunately, the effects of Q’s activity did not only stay online. In 2017 a man came into the Comet Ping Pong Pizzeria in Washington D.C. with an assault rifle claiming to be on mission to stop paedophilia happening in the basement of the
pizzeria. Apparently, the pizzeria did not have any basement. The man admitted that he was motivated by posts published by Q and his “believers” (presently known as QAnon).\(^1\) That was just the beginning—by 2020 around 17 different weapon usages in the USA were associated with QAnon and the FBI named QAnon as a sort of domestic terrorism\(^2\).

The QAnon’s ideas became popular not only in the USA, but around the world and the popularity led to terrorist incidents based on the idea of „Great Replacement“\(^3\)—such as the attack on mosque in New Zealand in March 2019. Recently, the most visible activity of QAnon supporters was the so-called „Capitol riot“ in January 2021, when the crowd entered the American Congress’ building during the procedure the presidential elections results’ approval\(^5\). Many participants were visible with QAnon posters, also the „QAnon Shaman”, identified as the leading promoter of the conspiracy on the Internet forums, was caught during the riots\(^6\). Already in 2018, the „Time“ magazine declared Q among the 25 most influential people on the Internet and the declaration proved to be a rightful one\(^6\).

Even though, the QAnon has been present online since 2017, its popularity significantly increased during the COVID-19 pandemic—in March 2020 the number of Facebook users engaged into QAnon discussions or groups increased from an average of 344 unique users per day between March 2 and 8, to 898 between March 22 and 29. Similarly, average Twitter users grew from 37,302 in the first week of March to 89,338 in the last\(^7\). The link with pandemic is strong as the supporters of QAnon theories are widely using hashtags „pandemic”, „stop vaccination” and similar. Noticeable increase of spreading QAnon ideas has been noticed via canals used by anti-vaccination movement (as explained further later in this article) and has transformed the large ecosystem of anti-vax communities online into radicalization pipelines for QAnon\(^8\). Moreover, as the newest data shows, since the beginning of 2020 almost 8% (1,352,851) of QAnon-related Twitter conversations mentioned one or more of the COVID-19-related keywords. The largest increase in these conversations occurred between 23 and 25 March, with a 422% increase, and another large growth occurred between 11 and 15 March, when the mentions increased by more than 304%, fuelled by conspiracies about celebrities’ infections\(^7\). Worldwide imposed lockdown may be of the reasons of such an increase. A lot of people provided with more free time, dedicated long hours to deeper Internet exploration and were coming across outputs such as QAnon theory. Connecting that with huge uncertainty about the future, fear of being ill and dropping trust towards authorities’ decisions created perfect timing for development of such an idea. “The mainstream platforms like Facebook, Twitter, and YouTube, started moderating and

---

1. This was only the top of iceberg, as, according to connected with QAnon theory, references to “pizza” made in the emails of John Podesta, Hillary Clinton’s campaign manager, were references to child trafficking („Pizzagate “)\(^1\).
2. Specifically, by 2020, eleven homicides, two armed standoffs, two instances of attempted and actual kidnappings and two attempted and actualized fire-bombings of a women’s health center and a mosque were connected to QAnon\(^2\).
3. The belief that the white population is the victim of deliberate racial and cultural replacement by non-whites in European nations and the United States\(^3\).
removing QAnon-related content. Due to this, QAnon supporters sought new online “homes” in less-moderated platforms and migrated to other platforms like Parler and Telegram. At the same time, the QAnon conspiracy theory became a global phenomenon [35].

QAnon was (and probably will be) using traumatic and controversial events in order to gain new believers and spread its range of influence. Examples of such incidents include: memo indicating that the FBI’s investigation into Russia was politically biased (January 2018) [46, p. 1921], yellow vest protests in France (December 2018) [32, 54, pp. 535–542], Jeffrey Epstein’s arrest and death (July 2019), Trump’s campaign and presidential elections in the USA (since December 2019 with its peak at the Capitol riot in January 2021) [62, pp. 192–193], George Floyd protest (April 2020). Presented data clearly shows strong connection between the crisis situation going viral into social media and the development of QAnon theory—intentionally or not, social media is creating a pipeline to conspiracy theories [31].

As Matthew N. Hannah rightfully points out, QAnon’s success relies on two principal factors: (1) QAnon is based on a slippage between data and information; (2) QAnon supports such a slippage with complex and interactive visualizations of bad information, thereby accelerating the tendency to see linkages between random events or data points [33, p. 3]. According to Garry et al., disinformation campaigns, coupled with the Internet and social media, has greatly enabled the unprecedented global effect of QAnon [28]. What is more, the recent analysis found out that the majority of users shared, rather than produced, information. This finding suggests that development of the QAnon narrative, and its effects on shaping the beliefs of those in the network, were driven by a few key users. The same analysis also confirmed that users sharing QAnon ideas are keen to share simplistic mental model, where the ground for political events is based on the conflict between bad (Evil) and good (God) forces [50].

4 Anti-Vaccination Movement

Another conspiracy theory worth analysing in the view of COVID-19 pandemic, (as mentioned before, connected and used by QAnon believers), is the anti-vaccination movement. Tracing back the history of vaccination we need to step back hundreds of years. Evidence exists that the Chinese employed smallpox inoculation as early as 1000 CE [8]. It was practiced in Africa and Turkey as well, before it spread to Europe and the Americas. Then Edward Jenner’s 1796 innovations made using of cowpox material to create immunity to smallpox successful [52]. Louis Pasteur’s 1885 rabies vaccine was the next to make an impact on human diseases. And then, at the dawn of bacteriology, developments rapidly followed. Antitoxins and vaccines against diphtheria, tetanus, anthrax, cholera, plague, typhoid, tuberculosis, and more were developed through the 1930s. The middle of the twentieth century was an active time for vaccine research and development, which led to creation of vaccines for polio and other common childhood diseases such as measles, mumps, rubella [52]. The recently most needed vaccine was the one against COVID-19 and it started being used at the end of December 2020.
Contrary to QAnon movement, anti-vaccination is not something new, it has history as long as the modern vaccine itself. The first anti-vaccine ideas were noted in the nineteenth century, when the smallpox vaccination was invented. In 188 the Association to Oppose Compulsory Vaccination was established in the Netherlands [7, p. 628] and in 1879 the Anti-Vaccination Society of America was founded in the United States [44] followed by many similar organizations being created shortly thereafter. After few years, thanks to visible positive results of the vaccination, the anti-vaccination movements started to disappear. Currently, the rise of new-old anti-vaccination movements is visible and the significant outbreak was prominent after the development of COVID-19 vaccination had been announced. Many parents choose not to vaccine their children, causing serious concerns among the public health authorities. Trying to explain the roots of such decision, public health commentators frequently refer to the activities of anti-vaccination movement [7, p. 629].

In the media, the phenomenon of “vaccine hesitancy” (which already existed about compulsory vaccinations for children and includes the more hardline “Anti-vax” position linking conspiracy theories and anti-science) is supported by the spread of disinformation [3, p. 14]. Reasons behind joining the anti-vaccination movement differ and may include deeply held beliefs, often of a spiritual or philosophical nature [72, pp. 430–432] (which is similar to reasons occuring in thenineteenth century) and, more importantly, the manipulation of public opinion through media (including social media) [49 p. 24405]. Especially the rise of Internet and ease of expression of one’s attitudes encourage the expansion of such movement. When we add here the uncertainty of the future and dropping trust to authorities (including public health authorities) the results may be deplorable. Fake news and conspiracy theories are not new phenomenon. Modern Internet social media platforms are quickly becoming main players in the market for news, they replace traditional media, but there are also mechanisms by which supposed fake news articles disseminate quickly and broadly to the news-consuming public [6, pp. 146–147].

According to the Center for Countering Digital Hate’s data, based on social media activity, the COVID-19 pandemic was time of significant rise of believers in the anti-vaccination theory. For example, since the COVID-19 pandemic has been announced, the number of followers of profiles related to anti-vaccination movement on Instagram grew by 1 million, which gave the total number of 7.3 million followers. The same happened on Facebook, where the number of followers of anti-vaccine groups and fan pages grew by nearly one million followers, which led to the total amount of 29 million followers and YouTube—growth by 5.8 million to the total number of 21.3 million followers [11]. The presented numbers may not be impressive comparing to the total number of social media users, but cannot stay

---

4 It „can be explained in terms of the improvement in medical practice and the growth of state and federal control over public health. The irregulars began to disappear with the rigid medical licensure laws, and the ‘accidents of vaccination’ ‘became fewer’” [36, p. 464–465, 478].

5 Such as Children Health Defence and its founder Robert F. Kennedy Jr. or filmmaker Del Bigtree and his Informed Consent Action Network.

6 Which is estimated on the level of around 3.6 billion people [57].
unnoticed, especially in the context of significantly increasing number of followers during the pandemic and rising visibility of their activity. Moreover, the anti-vaccination believers are not only those who are active on social media, but also those acting offline, who are currently nearly impossible to be counted. Technology helped conspiracy theories to spread. According to Fakras and Schou, “democracies are said to be under siege. ‘Fake news’, disinformation, conspiracy theories are flooding social media, ‘alternative’ facts are circulated by political elites and ‘post truth’ sentiments roam throughout society” [25, p. 103].

The rise of movements against vaccination and their propaganda can be a key factor to destabilize the epidemiological situation. The arguments used by the opponents of vaccination mainly show lack of reliable knowledge and are based on religious overtones. Religious arguments employed by anti-vaccination movements include the following statements: vaccines are produced on the basis of cells from aborted foetuses, vaccinations threaten God’s world order, vaccines contain gelatine obtained from the tissues of the cow’s body [38, p. 550]. Tweets in Spanish have experienced new kind of message presenting the vaccine as means of manipulating the human genetic code (8.1%) [34, p. 656].

5 The 5G Theory

The next conspiracy theory, strongly connected with the previous two and developing during COVID-19 pandemic is the so-called 5G theory. The outbreak of coronavirus pandemic coincided with the launch and development of 5G mobile network, which led to accusation of direct link between the new disease and upgrading mobile standards to 5G. The development of new technology is connected with the growing usage of smart electronic devices and wireless multimedia creating demand for faster network and higher quality of the provided services. Despite no scientific confirmation thereof, some people suggest that this technology negatively affects health [2].

The outbreak of the 5G theory occurred in January 2020, when number of social media users started sharing information that it is 5G causing COVID-19 or that it is accelerating the pandemic speed. The theory was not without support from the side of medical environment, which only made the theory more common [53]. The spread of this „news” was especially fast on Twitter, as well as on Facebook, because of shared news and videos linking those two issues together [2].

There is also strong connection between anti-vaccination and 5G movements, which, as already stated, lead to the QAnon movement. For example, one of the main spots of 5G protests in Australia is an area with traditionally lowest rate of child vaccination comparing to the rest of country. The linking part of 5G and COVID-19 was, due to the theory believers, the fact that Wuhan, where the coronavirus

---

7 Compared to the current 4G networks, 5G wireless communications provide high data rates (i.e., gigabytes per second), have low latency, and increase base station capacity and perceived quality of service [1, p. 1620].
Rise of Conspiracy Theories in the Pandemic Times

originated from, was the first location around the world which widely introduced 5G technology. Moreover, Italy, which was especially stroke by the pandemic in spring 2020, was the first European country, which deployed the 5G technology [10, p. 20].

The 5G theory supporters shared various histories explaining why 5G is so dangerous for humanity, including, as an example, its role as activator of microchips hidden in vaccines and leading to worldwide depopulation. Alternatively, such microchips threw the population control into the hands of people gathered around Bill Gates. Both explanations have their strong supporters sharing posts through the web [10, p. 21].

The spread and significance of the shared information is confirmed also by the world-wide reactions, including official statements from countries’ governments as well as from the WHO, denying such ideas [64]. Comparing to other theories, the anti-5G movement caused the most visible results of attacking and destroying several mobile phone towers and other similar devices across Europe (United Kingdom, Netherlands, France, Poland), which might impact local lives (cutting access to phone services and prevent, e.g., calling ambulance or police) [45].

The 5G theory was widely shared through the Internet, especially via Twitter. The research analysis on the development of the 5G movement via social media found out, that there has been number of people actively tweeting about the 5G and its link with coronavirus pandemic. The group included the opposers of this theory as by commenting the posts, they drew bigger attention to it. However, not only social media fuelled the theory spread. It has been also empowered by the dedicated websites or movies uploaded online (e.g. on YouTube) [2].

Contrary to the presented conspiracy theories, the 5G may in fact have strong link with COVID-19 pandemic, but not as its accelerator, but as a tool helping people to conduct „normal” life in the reality of restrictions and limits. Specifically, the 5G technology helps to provide better and faster online services, being so important while working and living remotely. Without doubts, pandemic helped to develop or boosted the development of services such as telehealth, online education, online retail and supply chains, smart manufacturing and factory automation, e-government, media, e-tourism, e-culture and many more. All of those are the online services, where the 5G plays significant, major role. The same applies to the fight with COVID-19 as the self-isolation control or contact tracking control is currently based on the Internet service. The 5G role however will not be limited only to the pandemic era, but it will cover the post-pandemic one, as many pandemic behaviours will certainly stay with us for much longer [26, 55, pp. 73–75].

The mentioned benefits of 5G technology were also the subject of information spread via the Internet, including social media. The source of these information was mainly Chinese, but also covering European languages and others (such as Indonesian or Vietnamese). The stories were presenting the usage of 5G technologies in fields such as telemedicine, robots helping to fight with coronavirus spread and

---

8 Examples may include the official statements of Australian [5] or UK government [18].
9 The January 2021 attack on Capitol by QAnon followers may still be treated as the most spectacular.
lockdown and others. The main thought was to promote 5G benefits all over the world, not only within countries where the 5G technology was already indeed used.10

6 Level of Trust Towards Governments

The raise of conspiracy theories during COVID-19 times is accompanied with the diminishing level of trust among societies towards governments. Lack of trust in government results from a crisis of neoliberal democracies. Generally, during the times of crisis, which COVID-19 pandemic definitely is, people’s level of trust towards governments tends to grow, as people start to rely more on public institutions to address complex challenges. The same initially happened in spring 2020, when the pandemic broke out, however, after the first pandemic year had ended, the level of trust fell significantly in majority of countries. It is noted that the credibility of public institutions has been fractured by years of political polarization, rising inequality, lack of credible information, rising inequality and economic disillusionment [14].

On the other hand, trust has played an important role in fighting with COVID-19—in countries where the level of trust towards government was high, the virus spread was slower and mortality rate was lower. In order to make anti-virus policy as clear and transparent as possible, different countries introduced different measures. The United Kingdom launched the RESIST Counter Disinformation toolkit to prevent spreading misinformation related to the virus. Denmark created the inter-ministerial body to handle the misinformation campaigns. The Indian Ministry of Health introduced the WhatsApp chat box to raise awareness and answer questions about the pandemic. Malaysia launched a special website to classify websites and report information as real or fake [14].

Nevertheless, the general long-term trend, including the pre-pandemic times, is that level of trust toward governments is diminishing around the countries. For

10 Such an information spread was called the „state-sanctioned counter-propaganda “ [10, p. 23].
example, in the United States trust in the national government declined from 73% in 1958 to 24% in 2021, which is based on the online and telephone pool among American citizens researched by Pew Research Center [48] (Fig. 1).

The same is happening in Europe, where decline in trust level is observed, however the current level of trust is not as low as in the United States. Diminishing level of trust towards governments is a world-wide issue—the number of citizens expressing confidence and trust towards governments in 62 developing and developed countries peaked at 46% (on average) in 2006 and fell to 36% in 2019. It is also accompanied with diminishing level of trust towards other institutions—e.g. financial institutions (drop from 55% in 2006 to 46% in 2019) or political parties (15–20% in years 2000–2019) [47]. Even though the survey measured trust in government institutions in the context of economic security, the results fit into the overall context related to trust during a COVID-19 pandemic. All in all, lack of trust to governments is strictly connected with the crisis of neoliberal democracies. The crisis of neoliberal democracies is brought by a deliberate disinformation campaign conducted by hostile foreign illiberal regimes or domestic organizations. Neoliberal democracies are in crisis mainly because, in dealing with information as well as in other fields, neoliberalism undermines the reliability of democratic ideas and values [58, p. 71]. The crisis of democracy is registering in e.g. distrust of cat-based information and news, and devastation of liable state institutions [70]. Democratic institutions depend on the rule of law. Fake news weakens the rule of law as it derives its strength from emotional responses in a manner that threatens both the rule of law and a political culture’s willingness to trust democratic institutions and governments [6, p. 127].

The remarks regarding historically low level of trust towards national government in the United States is confirmed by the research of the the Pew Center. Due to its data, the highest level of trust towards government was around 1965 (nearly 80% of citizens were to trust the government), but since 2000 it has been regularly dropping down to current level of around 24%, which is still above the historical low, which was 17% in 2019. Nevertheless, the trend is going down and there are no signs of changing it. Noticeable is that the level of trust was finally eroding (after initial grow) during the times of crisis; the decline was happening during the Vietnam War, Watergate affair, 9/11 attacks, at the beginning of war in Iraq and currently remains low, which was verifying in surveys conducted among Americans [48]. As COVID-19 pandemic is on-going, the low level in trust stays clearly connected with that situation and arises from pandemic.

There are however countries where the level of trust towards governments is still very high. The highest level of trust was noted in China (putting aside question about the reliability and honesty of answers received from the questioned respondents), where in 2021 91% of citizens trusted in Chinese government (9 points more than in 2020). High level of trust was also observed in Saudi Arabia (82%—no change since 2020) and India (74%, 5 points less than in 2020). On the other hand, only 22% of citizens have trust towards government in Argentina (8 points less than in 2020), 37% in Russia (3 points more than in 2020), 42% in the United Kingdom (3 points less than in 2020) and 47% in Germany (12 points less than in 2020). This data, resulted from the poll conducted in 28 states among 36.000 people who have
been asked about a level of trust towards specific institutions, shows that there are more countries where the level of trust lowered than those where it grew [4]. Other words, according to public opinion, the governments have been unprepared for the pandemic [43].

The drop in level of trust during pandemic was also noted by the Eurofound survey conducted online in three phases: at the beginning of the pandemic (April/May 2020), just after first lockdowns (June/July 2020) and a year after the pandemic in Europe began (February/March 2021). The data shows that level of trust towards government between those three dates was declining, excluding Malta where in February/March 2021 it was the same as in June/July 2020—4.5 (comparing to 6.0 in April/May 2020) and in Hungary where level of trust in February/March 2021 was slightly higher (3.0) than in June/July 2020 (2.9), however still lower than in April/May 2020 (3.3) [24]. In general, the level of trust in the EU countries was dropping in each of the analysed periods, reaching its lows in spring 2021. The average level for all 27 EU countries was 4.8 in April/May 2020, 4.6 in June/July 2020 and 3.9 in February/March 2021. The highest level of trust was noted in Finland, Denmark and Luxembourg, while the lowest—in Bulgaria, Hungary and Poland [24]. This confirms the thesis that COVID-19 pandemic was an event with very strong impact on the level of trust of citizens towards national governments and, therefore, functionality of the countries.

The above findings are additionally confirmed by the data prepared and presented by the World Bank based on 4700 indicators drawn from many independent sources, which shows that the world median of trust towards governments has been decreasing, especially during the last few years. What is interesting is that e.g. in Europe most of the countries are presenting the level of trust below the world median, only Estonia, Portugal and Slovenia are crushing the line. On the other hand, Asian countries such as Japan and South Korea together with Pacific countries—New Zealand and Australia are presenting level of trust higher than the world median (of about 1–1.5 point). Therefore, all the data shows the level of trust towards government is regularly diminishing [61].

The same results are presented by the Edelman Trust Barometer. The indicator has been prepared by the Edelman, global communication company, for already 22 years. They announced the 2022 as “The Cycle of Distrust”. [12] The gathered data shows that back in 2020 governments were trusted more than business, NGOs and media, while in 2022 this sequence has significantly changed—the most trusted is business, then NGOs and then government, media as the last. Moreover, over 60% of respondents indicated that governments are not providing a good pandemic response. Again, the same as presented by Statista, the higher level of trust towards governments was noted in China, UAE and Indonesia, which are also the biggest

---

[11] In this survey participants were to answer the following question: “Please tell me how much you personally trust each of the following institutions. -Your country’s government”. Trust was measured on a scale of 1 to 10, where 1 meant that one does not trust at all and 10 meant that one trusts completely.

[12] The survey was powered by Edelman Data & Intelligence (DxI) and consisted of 30-min online interviews conducted between November 1 and November 24, 2021.
gainers of trust comparing to 2021, while the lowest was in Russia, Japan, South Korea and the USA. On the other hand, the biggest decline was noted in Germany, Australia, The Netherlands, South Korea and the USA. The USA has also been noting 10 points decline of trust level during the last 5 years. In 17 out of 27 researched countries, the level of trust towards governments declined. What is more and crucial from the point of view of this article, it is indicated that the most powerful trust builder shall be the information quality and fight with fake news. Especially, that over 76% of the researched population worry about the false information or false news being used as a weapon [23].

There are no doubts, as confirmed above, that the trust in governments and neoliberal democracies has been declining over the years and in the COVID-19 reality, it is especially low and the drop is significant. This creates great opportunity for various conspiracy theories to gain new followers and increase its shares in the public discourse. Weak trust towards governmental actions leads citizens to follow others’ ideas, ideas that are more understandable for people and connected with guidelines not interrupting their previous life (as it happens often with measures undertaken by the governments).

7 Conclusions

The aim of this article was to present the three main conspiracy theories that emerged and developed during the COVID-19 pandemic: QAnon, the anti-vaccine movement, and anti-5G movement. The growing activity of these movements, their direct relationship to the pandemic and their impact on social and political life was observed. The influence of the pandemic on the acceleration of the development of conspiracy theories was demonstrated. The relationship between the development of conspiracy theories and decreasing trust in government was proven. Conspiracy theories, especially during the COVID-19 pandemic, became lively and widely discussed. This was largely due to citizens’ distrust in the authorities and in the official information provided by them together with the crisis of neoliberal democracies. In all these theories, believers tend to fight against official explanations and declarations and to seek better, more appropriate explanations for the occurring problems. It is a result of the lack of trust in authorities. According to conspiracy theories, scientific knowledge is neither infallible nor univocal, and all human interventions in nature imply risk.

Undoubtedly, social media helped in spreading conspiracy theories. They have given quite convenient tool to vent the frustration and to undermine the rule of law and the government’s authority. Democratic governments have often been powerless in the face of the flood of false information. Just as often, they had no idea how to counter the growth of conspiracy theories. The marked decline in trust toward governments during the pandemic period corresponded with an increase in interest in the messages sent by the representatives of conspiracy theories.

Connected with the above is the position that the conspiracy thinking is more likely to emerge during times of social crisis [67] and comes from the general thinking that the major event must have a major cause [42]. The pandemic is definitely
both: social crisis and major event, therefore it created perfect timing for the rise of conspiracy theories. Associated with diminishing trust for authorities (and neoliberal democracies) and the raise of new pandemic—related fake news, the development of conspiracy theories is not a surprise.

References

1. Agiwal, Mamta, Abhishek Roy, and Navrati Saxena. 2016. Next generation 5G wireless networks: a comprehensive survey. IEEE Communications Surveys & Tutorials, 18, no. 3.
2. Ahmed, Wasim, Josep Vidal-Alaball, Joseph Downing, and Francesc López Seguí. 2020. COVID-19 and the 5G conspiracy theory: social network analysis of twitter data, Journal of Medical Internet Research, 22(5).
3. Alteri, Luca, Louisa, Parks; Luca, Raffini, Tommaso, Vitale. 2021. Covid-19 and the structural crisis of liberal democracies. Determinants and consequences of the governance of pandemic. Partecipazione e Conflitto 2021, 14(1).
4. Armstrong, Martin. 2022. Where trust in governments is highest and lowest. Statista, 19 January 2022. https://www.statista.com/chart/12634/where-trust-in-government-is-highest-and-lowest/. Accessed: 13.03.2022.
5. Australian Government. 2020. 5G misinformation and COVID-19. https://www.infrastructure.gov.au/media-centre/5g-misinformation-and-covid-19. Accessed 13.03.2022.
6. Barnhizer, Daniel, Adam, Candeeb. 2020. Elite theory, media regulations and ‘fake news’. In Disinformation and digital media as a challenge for democracy, ed. G. Terzis., D. Kloza, E. Kuzelewska, D. Trottier, Intersentia, Cambridge-Antwerp-Chicago 2020.
7. Blume, Stuart. 2006. Anti-vaccination movements and their interpretations. Social Science & Medicine 62 (3): 2006.
8. Boylston, Arthur 2012. The origins of inoculation. Journal of the Royal Society Medicine 2012, vol. 105. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3407399/pdf/JRSM-12-K044-JL.pdf. Accessed 13.03.2022.
9. Britannica. 2021. https://www.britannica.com/topic/conspiracy-theory. Accessed: 12.03.2022.
10. Bruns, Axel, Stephen, Harrington, Edward, Harcombe. 2020. ‘Corona? 5G? Or Both?’: the dynamics of COVID-19/5G conspiracy theories on facebook. Media International Australia 2020, 177(1).
11. Center for Countering Digital Hate. 2020. The anti-vax industry. how big tech powers and profits from vaccine misinformation. https://www.countermate.com/anti-vaxx-industry. Accessed 13.03.2022.
12. Chan, Ho Fai, Stephanie M., Rizio, Ahmed, Skali. Torgler, Benno (2021). Early COVID-19 government communication is associated with reduced interest in the QAnon conspiracy theory, CREMA working paper, No. 2021–12, Center for research in economics, management and the arts (CREMA), Zürich.
13. Chandler, Kylar J. 2020. Where we go 1 we go all: a public discourse analysis of QAnon. McNair Scholars Research Journal, 13(1), Article 4. https://commons.emich.edu/cgi/viewcontent.cgi?article=1154&context=mcnair. Accessed 12 March 2022.
14. Chew, Bruce, Michael, Flynn, Georgina, Black, Rajiv, Gupta. 2021. Sustaining public trust in government. Deloitte Insights, 4th March 2021. https://www2.deloitte.com/xen/en/insights/industry/public-sector/government-trends/2021/public-trust-in-government.html. Accessed 13.03.2022.
15. Cook, Jesselyn. 2020. Online anti-vax communities have become a pipeline for QAnon Radicalization. HuffPost. https://www.huffpost.com/entry/qanon-anti-vax-coronavirus_n_5fbeb0c0c5b61d04b4ba6921?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuY3Npcy5vcmcYmxvZ3MvdGVjaG5vbG9neS1wb2xpY3ktYmxvZy9ubly1vbmUtaW1tdW51LXNwcmVhZC1xLWFuZ24tdGhyb3VnaC1zLzB2NpYWtbWVkaWEtYW5kLXBhbmRlbWlw&guce_referrer_sig=AQQAAAI2K1e8vWH21nxSDgRgn9vB0iKMiR5DepWGRlRzV1FksVEs8mFZBz2ALiFWXR38_oB2L1mbB4JpuyWBRlWgC5g9VTThEIswLZWC0xQOjZptofE3i3OyBEljt-XFBhfz999USZ6ljEJxANlxSEHMsmjdlD-ffGdG7wwI. Accessed 12.03.2022.
16. Cosentino, Gabriele. 2020. From pizzagate to the great replacement: the globalization of conspiracy theories. In Gabriele Consenntino, Social Media and the Post-Truth World Order, Cham.
17. Davey, Jacob, Julia, Ebner. 2019. ‘The great replacement’: the violent consequences of mainstreamed extremism, institute for strategic dialogue. https://www.isdglobal.org/wp-content/uploads/2019/07/The-Great-Replacement-The-Violent-Consequences-of-Mainstreamed-Extremism-by-ISD.pdf. Accessed 12.03.2020.

18. Department for Digital, Culture, Media & Sport. 2020. 5G and coronavirus (COVID-19). https://www.gov.uk/guidance/5g-and-coronavirus-covid-19. Accessed 13.03.2022.

19. Douglas, K.M., R.M. Sutton, and A. Cichocka. 2017. The psychology of conspiracy theories. Current Directions in Psychological Science, 26(6).

20. Douglas, K.M., J.E. Uscinski, R.M. Sutton, A. Cichocka, T. Nefes, C.S. Ang, and F. Deravi. 2019. Understanding conspiracy theories. Political Psychology, 40.

21. Douglas, K.M., J.E. Uscinski, R.M. Sutton, A. Cichocka, T. Nefes, C.S. Ang, and F. Deravi. 2019. Understanding conspiracy theories. Advances in Political Psychology, 40(1).

22. Douglas, Karen, and Robbie M. Sutton. 2018. Why conspiracy theories matter: A social psychological analysis. European Review of Social Psychology, 29(1).

23. Edelman. 2022. Edelman trust barometer 2022. Global Report. https://www.edelman.com/trust/2022-trust-barometer. Accessed 13.03.2022.

24. Eurofund. 2021. Democracy and trust during COVID-19. https://www.eurofound.europa.eu/data/covid-19/democracy-trust. Accessed 13.03.2022.

25. Fakras, Joahan; Jannick, Schou, 2020. Post-truth discourses and their limits. In Disinformation and Digital media as a Challenge for Democracy, ed. G. Terzis., D. Kloza, E. Kuzelewska, D. Trottier. Intersentia, Cambridge-Antwerp-Chicago.

26. Gallagher, Aoife, Jacob Davey, and Mackenzie Hart. 2020. ‘Corona? 5G? Or Both?’: the dynamics of COVID-19/5G conspiracy theories on facebook. Media International Australia 177 (1): 15.

27. Gallagher, Aoife; Jacob, Davey, and Mackenzie, Hart. 2020. The genesis of a conspiracy theory. key trends in QAnon activity since 2017. ISD. https://www.isdglobal.org/wp-content/uploads/2020/07/The-Genesis-of-a-Conspiracy-Theory.pdf. Accessed 12 March 2022.

28. Garry, Amanda, Samantha, Walther, Rukaya, Rukaya, and Ayan, Mohammed. 2021. QAnon conspiracy theory: examining its evolution and mechanisms of radicalization. Journal for Deradicalization, (26).

29. Goertzel, Ted. 1994. Belief in conspiracy theories. Political Psychology, 15.

30. Gu, Fu., et al. 2021. The role of conspiracy theories in the spread of COVID-19 across the United States. International Journal of Environmental Research and Public Health 2021 (18): 3843.

31. Haimowitz, Ian. 2020. No one is immune: The spread of Q-anon through social media and the pandemic. Center for Strategic and International Studies, December 2020. https://www.csis.org/blogs/technology-policy-blog/no-one-immune-spread-q-anon-through-social-media-and-pandemic. Accessed 13.03.2022.

32. Hamdaoui, Soraya. 2021. Anti-populism during the Yellow Vest protests: From combatting the Rassemblement National to dealing with street populists. The British Journal of Politics and International Relations. https://doi.org/10.1177/1369148120974014. Accessed 13.03.2022.

33. Hannah, Matthew N. 2021. A conspiracy of data: QAnon, social media, and information visualization. Social Media+Society.

34. Herrera-Peco, Ivan, Beatriz, Jiménez-Gómez, Magdalena, Romero, S. Carlos, Juan J. Deudero, María, García-Puente, Elvira, Benítez De Gracia, and Carlos, Ruiz Núñez. 2021. Antivaccine movement and COVID-19 negationism: a content analysis of spanish-written messages on Twitter. Vaccines 2021, vol. 9.

35. Hoseini, Mohamad, Philipe, Melo, Fabricio, Benevenuto, Anja, Feldmann, and Savvas, Zannettou. 2021. On the globalization of the QAnon conspiracy theory through telegram. https://arxiv.org/pdf/2105.13020.pdf. Accessed 13.03.2022.

36. Kaufman, Martin. 1967. The American anti-vaccinationists and their arguments. Bulletin of the History of Medicine, No. 41/1967.

37. Kim, Seoyong, and Sunhee, Kim. 2021. Searching for general model of conspiracy theories and its implication for public health policy: analysis of the impacts of political, psychological, structural factors on conspiracy beliefs about the COVID-19 Pandemic. International Journal of Environmental Research and Public Health, 18(266).

38. Kolštajtaj, Witold P., Barbara, Kolštajtaj, Lech, Panasiuk, Jaroslaw, Sobieszczanska, Irena D, Karwat. 2020. Anti-vaccine movements – a form of social activity for health care, ignorance or diversion aimed at destabilizing the health situation? Part 1. Epidemiological safety. Vaccinations – pros and cons. Annals of Agricultural Environmental Medicine. 27(4).
39. Kritikos, Mihalis. 2020. Tackling mis- and disinformation in the context of scientific uncertainty. In Disinformation and Digital media as a Challenge for Democracy, ed. G. Terzis., D. Kloza, E. Kuželewska, D. Trottier. Intersentia, Cambridge-Antwerp-Chicago

40. Kuželewska Elżbieta, and Mariusz, Tomaszuk. 2020. European human rights dimension of the online access to cultural heritage in times of the COVID-19 Outbreak. International Journal of Semiotics Law (2020). /link.springer.com/article/https://doi.org/10.1007/s11196-020-09712-x. Accessed 12 March 2020

41. Laurent Cordonier, Cafiero, Florian, and Gérald, Bronner. 2021. Why are conspiracy theories more successful in some countries than in others? An exploratory study on Internet users from 22 Western and non-Western countries. Social Science Information, SAGE Publications, https://hal.archives-ouvertes.fr/hal-03264549/document. Accessed 12 March 2022.

42. Leman, Patrick J., and Marco, Cinnirella. 2007. A major event has a major cause: evidence for the role of heuristics in reasoning about conspiracy theories. Social Psychology Review, 9.

43. Mah-Hui, Lim, Michael Heng, Siam-Heng. 2022. COVID-19 and the structural crises of our time, SEAS-Yusof Ishak Institute, Singapore.

44. Nour, Rawan. 2019. A systematic review of methods to improve attitudes towards childhood vaccinations. Careus, 11(7).

45. Osborne, Charlie. 2020. 5G mast arson, coronavirus conspiracy theories force social media to walk a fine censorship line. ZDNet, 30.04.2020. https://www.zdnet.com/article/amid-5g-mast-arson-and-coronavirus-conspiracy-theories-social-media-walks-a-fine-line/. Accessed 13 March 2022.

46. Pargulies, Peter. 2019. Legal dilemmas facing white house counsel in the trump administration: the cost of public disclosure of FISA requests. Fordham Law Review, 87. https://fordhamlawreview.org/wp-content/uploads/2019/03/06_Margulies-1913-1935.pdf. Accessed 13.03.2022.

47. Perry, Jonathan. 2021. Trust in public institutions: Trends and implications for economic security. United Nations, 20 July 2021. https://www.un.org/development/desa/dspd/2021/07/trust-public-institutions/. Accessed 13.03.2022.

48. Pew Research Center. 2021. Public Trust in Government: 1958–2021. https://www.pewresearch.org/politics/2021/05/17/public-trust-in-government-1958-2021/. Accessed 13.03.2022.

49. Poland, Gregory A., and Robert M. Jacobson. 2001. Understanding those who do not understand: A brief review of the antivaccination movement. Vaccine, 19/2001.

50. Priniski, Hunter J., Mason, McClay, Keith J. Holyoak. 2021. Rise of QAnon: A mental model of good and evil stews in an echochamber. In. Proceedings of the 43rd annual meeting of the cognitive science society, eds. T. Fitch, C. Lamm, H. Leder, & K. Teßmar-Raible. Cognitive Science Society. https://arxiv.org/ftp/arxiv/papers/2105/2105.04632.pdf. Accessed 13.03.2022.

51. Radermecker, Anne-Sophie V. 2021. Art and culture in the COVID-19 era for a consumer-oriented approach. SN Business & Economics, 1: 4.

52. Riedel, Stefan. 2005. Edward Jenner and the history of smallpox and vaccination. BUMC Proceedings 2005, vol. 18. https://www.historyofvaccines.org/timeline/all. Accessed: 13.03.2022.

53. Shanapinda, Staanley. 2020. No, 5G radiation doesn’t cause or spread the coronavirus. Saying it does is destructive. The Conversation, 7.04.2020. https://theconversation.com/no-5g-radiation-doesnt-cause-or-spread-the-coronavirus-saying-it-does-is-destructive-135695. Accessed 13.03.2022.

54. Shultziner, Doron, and Irit S. Kornblit. 2020. French yellow vests (Gilets Jaunes): similarities and differences with occupy movements. Sociological Forum, 35(2).

55. Siriwardhana, Yushan; Chamitha, De Alwis, Gürkan, Gür, Mika, Ylianttila, and Madhusanka, Liyanage. 2020. The fight against the COVID-19 pandemic with 5G technologies. IEEE Engineering Management Review, 48(3).

56. Spocchia, Gino. 2021. What role did QAnon play in the Capitol riot? The Independent. https://www.independent.co.uk/news/world/americas/us-election-2020/qanon-capitol-congress-riot-trump-b1784460.html. Accessed 12.03.2022.

57. Statista. 2022. Number of social network users worldwide from 2017 to 2025. https://www.statista.com/statistics/278414/number-of-worldwide-social-network-users/. Accessed 13.03.2022.

58. Stocchetti, Matteo. 2020. (Dis)information, neoliberalism and the strength of democracy in the digital age. In Disinformation and digital media as a challenge for democracy, ed. G. Terzis., D. Kloza, E. Kuželewska, D. Trottier. Intersentia, Cambridge-Antwerp-Chicago 2020.

59. The Soufan Center. 2021. Special report: QUANTIFYING THE Q CONSPIRACY: a data-driven approach to understanding the threat posed by QAnon. https://thesoufancenter.org/wp-content/uploads/2021/04/TSC-White-Paper_QAnon_16April2021-final-1.pdf. Accessed 12.03.2022.
Rise of Conspiracy Theories in the Pandemic Times

60. The Time. 2018. The 25 Most Influential People on the Internet. https://time.com/5324130/most-influential-internet/. Accessed 12.03.2022.

61. The World Bank. 2022. Trust in Government, https://govdata360.worldbank.org/. Accessed 13.03.2022.

62. Tollefson, Jeff. 2021. How trump turned conspiracy – theory research upside down. Nature, 590. https://www.nature.com/articles/d41586-021-00257-y. Accessed 13.03.2022.

63. UNESCO. 2018. Journalism, „fake news“ & disinformation. Handbook for Journalism Education and Training. Paris 2018. https://en.unesco.org/sites/default/files/journalism_fake_news_disinformation_print_friendly_0.pdf. Accessed 12 March 2022.

64. United Nations. 2020. COVID-19: 5G broadband conspiracy ‘a hoax with no technical basis’, UN telecoms agency. https://news.un.org/en/story/2020/04/1062362. Accessed 13.03.2022.

65. Uscinski, Joseph E. 2017. The Study of Conspiracy Theories, Argumenta 2017, vol. 10. https://www.argumenta.org/wp-content/uploads/2017/10/Argumenta-Joseph-Uscinski-The-Study-of-Conspiracy-Theories.pdf. Accessed 12 March 2022.

66. Uscinski, Joseph E., Adam M. Enders, Casey A. Klofstad, Michelle I. Seelig, John, R. Funchion, Caleb, Everett, Stephan, Wuchty, Kamal, Premaratne, and Manohar, N. Murthi. 2020. Why do people believe COVID-19 conspiracy theories? The Harvard Kennedy School (HKS) Misinformation Review, Volume 1, Special Issue on COVID-19 and Misinformation.

67. van Prooijen, Jan Willem, and Karen M. Douglas 2017. Conspiracy theories as part of history: the role of societal crisis situations. Memory Studies 2017, vol. 10(3).

68. van Prooijen, Jan-Willem, and Karen M. Douglas. 2018. Belief in conspiracy theories: Basic principles of an emerging research domain. European Journal of Social Psychology 2018; vol. 48(7): 897–908. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6282974/. Accessed 12 March 2022.

69. van Prooijen, Jan-Willem. 2018. The psychology of conspiracy theories. England: Routledge.

70. Williams, Michelle. 2021. The crisis of democracy: neoliberal capitalism, authoritarianism and reclaiming democracy. In Destroying democracy. neoliberal capitalism and the rise of authoritarian politics. Michelle Williams and Vishwas Satgar. Wits University Press.

71. Winter, Jana. 2019. Exclusive: FBI document warns conspiracy theories are a new domestic terrorism threat. https://news.yahoo.com/fi-documents-conspiracy-theories-terrorism-160000507.html. Accessed 12.03.2022.

72. Wolfe, Robert M.; Sharp, Lisa K. 2002. Anti-vaccinationists past and present. British Medical Journal, 525/2002.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.