COVID-19 ~~Disinformation and Conspiracy Theories~~ in Croatia

Nebojša Blanuša

Mato Brautović

Ana Brakus

Marijana Grbeša Zenzerović

Mirjana Tonković

Milica Vučković

Andrea Vranić

GONG

Pro-fact: Research, education, fact-check
and debunk COVID-19 related disinformation
narratives in Croatia

Coordinator of the Pro-Fact:
Gong

Partners:
Faculty of Political Science in Zagreb
University of Dubrovnik
Faculty of Electrical Engineering and Computing
Faktograf – Association for the Informed Public.

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Introduction

ANA BRAKUS
Faktograf — Association for the Informed Public

dr. NEBOJŠA BLANUŠA
Faculty of Political Science, University of Zagreb

Dear reader, the edited volume in front of you is a result of the scientific and educational project 'Pro-fact: Research, education, fact-check and debunk COVID-19 related disinformation narratives in Croatia'. The main goal of the project was to study and cope with disinformation on COVID-19 by using multi-method multidisciplinary research activities, intersectoral dissemination of knowledge and training of journalists and students. As an effective response to the challenges of democracy and society caused by the current pandemic, this project used a combination of different expertise and methods – to debunk online sources, social networks, and their disinformation narratives, as well as to discern the ways of (non)conspiratorial reasoning about COVID-19 from various disciplines by combining research and educational techniques. Through research, awareness-raising, and capacity-building methods, the project comprehensively approached the social, political, and health problems of spreading disinformation campaigns on COVID-19 pandemic.

In more details, our aim was to apply the results of three-fold activities, including research, dissemination, and education of specific professional groups to achieve the objectives, such as: 1) building and strengthening capacities of the multidisciplinary team in Croatia for detecting and combating disinformation campaigns through the analyses of research results, exchange of expertise and networking. That prepared the team for 2) efficient disclosure of COVID-19 disinformation campaigns in Croatia through debunking and dissemination of research results, as well as for 3) increasing media literacy competencies of journalists and the general public in Croatia, through education and campaigns, together with constant fact-checking of COVID-19 disinformation.

This edited volume is primarily focused on presenting the main research activities and results, contributing by that to their dissemination to the wider public. The whole set of research activities was conceived and organized in a sequential way, first of all by leaning on constant fact-checking and debunking activities of Faktograf.hr throughout the whole period of the project. Initially, the sources of disinformation identified and debunked by Faktograf.hr were used as an initial sample, which was widened through the snowball method and additional retrieving of regional Facebook posts related to COVID-19 pandemic. Faktograf.hr, the first Croatian fact-checking media, published it's first coronavirus related fact-check in January 2020 and by January 2023 has published almost 800 articles. During the entire duration of the COVID-19 pandemics, Faktograf.hr has been operating the Live blog Disinformation on the coronavirus, in order to provide all its readers with a single overview of COVID-19 disinformation. In the next step, collected datasets were subjected to social-network and visual-network analysis, with the purpose to identify

the online purveyors of COVID-19 disinformation in Croatia (see chapter 2 and 3). These analyses revealed the regional eco-system of disinformation, which does not know the boundaries between nearby states sharing the similar language. Our following step was dynamic network analysis showing how these disinformation networks were built since the beginning of pandemics through several waves (see chapter 3). After that, our team have conducted the same types of analysis to identify existing sources of fighting disinformation, i.e. fact-checking and fact-disseminating networks and their strategies against purveyors of disinformation. In the next step we carried on with manual content and discursive analyses of both types of sources. Such analyses, described in the chapter 5 gave us an insight into the whole world of "plandemic" themes, imagination, and language that we translated in the format of the questionnaire subsequently applied in the survey on nationally representative sample of internet users in Croatia. The analysis of survey results revealed the structure of conspiratorial thinking about COVID-19, its interconnectedness with other types of conspiracist beliefs, and background characteristics which differentiate believers and non-believers in such disinformation (see chapter 6). Survey results enabled us also to inspect the relationship between conspiracism and behavioral intents of Croatian citizens, especially how COVID-19 conspiracy beliefs are related to the willingness of vaccination against it (see chapter 7). These invaluable insights were the first steps on our way to get deeper into the preconditions and processes of psycho-social formation of conspiratorial beliefs on pandemic. In our further step we did the focus groups of believers and non-believers in COVID-19 conspiracy theories, followed by the experiment which tested how usual forms of everyday communication and argumentation or identified layman strategies can modify perceptions and emotions of disinformation related to some of the most notorious conspiracy theories about spreading COVID-19 virus (see the chapter 8). The aim was to establish better understanding of conspiratorial and anti-conspiratorial reasoning processes that can be built into our disseminating and educational activities, as well as further public campaigns against disinformation. Finally, our interdisciplinary team developed the proof-of-concept prototype for automated semantic analysis of disinformation texts and structured database (text plus propagation links between sources) of disinformation in Croatian language.

This set of activities has established not only a sound multi-methodological approach which can be used in our further studies, but also enabled us to detect emerging online COVID-19 related disinformation campaigns with a potential negative impact on public opinion-forming at the national level. Through such an approach we were able to assess their impact, as well as to analyze relevant actors, the content they produce, tools they use

in dissemination dynamics, and focal targets of disinformation campaigns. Therefore, conducted set of mutually related research activities provided empirically founded databases that can serve as a basis for creating more adequate tools and methods for recognizing, exposing, and tackling disinformation, and improvement of legal framework to fight against them. Following our research activities, we used our findings in raising the awareness and sensitizing Croatian general public about tendencies and dynamics about COVID-19 disinformation processes in social media and among citizens. Furthermore, these findings were used in educating particular professional groups such as journalists and students of journalism.

To conduct such multilayered research, we gathered and built a national multidisciplinary team of experts from different areas of expertise whose general aim was to target COVID-19 related disinformation from different angles which we recognized as the social, political and health problem. Throughout the 15-month period we learned a lot from each other's in cooperation at different stages of the project. Otherwise, it would not be possible to ensure a multidisciplinary approach and multisectoral perspective of the project, implementation of activities and the provision of credible results, which are scientifically based and served as a basis for advocacy, dissemination of findings, and education. This was invaluable experience which made us aware of our complementarity and urgent need for future cooperation.

The team involved relevant scholars and professionals in their fields of research, exposing and debunking disinformation related to COVID-19. Such composition of the team enabled the multiplier effect and sustainability of the results. The whole team was involved in all parts of the project, but the main activities in different phases were provided by the sub-team working groups, according to their field of expertise. During these phases other team members functioned as critical commentators and providers of expert insights that can improve particular research activities in terms of relevant content, hypotheses and methodological approaches. In that sense, debunking activities were conducted by Faktograf.hr, while the other team members got an insight in approaches, standards, and criteria they applied, especially through the focus groups with journalists who work for Faktograf.hr. That enabled other team members to get fuller insights into usual activities and techniques fact-checkers use, and to prepare themselves for further phases of the project. Social network analysis, visual network analysis and dynamic network analysis were mainly conducted by the team members from the Department of Communication studies, University of Dubrovnik, in collaboration with the members from the Faculty of electrical engineering, University of Zagreb. Manual content and discourse analysis were done mainly by the members of the Faculty of Political Science, but in close cooperation with

members of previously mentioned two academic institutions. Construction of the survey questionnaire and the analysis of survey results was mainly the result of close cooperation between members of the Faculty of Political Science and Faculty of Humanities and Social Sciences from the University of Zagreb, who communicated with the external agency (Ipsos), which prepared and conveyed the fieldwork. However, in this process all other team members were consulted in the process of item constructions, especially those from Gong and Faktograf.hr. Further steps, including focus groups with believers and non-believers in COVID-19 conspiracy theories, served a double function. They were conceived as the means that will provide deeper insights into our survey results, as well as the source of information for preparing detailed procedure of experiment. Although the most engaged in this process were members from the Faculty of Political Science and Faculty of Humanities and Social Sciences, other members left their mark in designing this procedure. The same logic was also applied in the development of the proof-of-concept prototype for automated semantic analysis of disinformation texts. The aim of such coordination of the entire team (along with extended collaborators) was to share the knowledge from different areas, to get close insight into every aspect of the project, to create a dynamic network among them, and to enable the team to continue working on this topic after the project is finished. Together with involvement in dissemination and educative activities, such organization improved the status of the team as experts in combating disinformation in the region. General tenet and the main strategical commitment of our multidisciplinary team was that tackling disinformation, together with media literacy and the strengthening of quality journalism is extremely important in defending democracy at the national and EU level. This was also recognized by EDMO and European Commission by providing us with the new project, titled ADMO, with the task to establish the regional digital observatory for fighting disinformation in the next three years.

In the following pages of the edited volume, you will find detailed chapters written by members of our project team. These chapters are organized according to the logic of sequential research phases, and each contains the main research questions, methodological descriptions, obtained empirical results, insights, and conclusions we have reached. We hope that it will be as interesting for you to read it as it was for us to research this phenomenon.

1

Fact checking in Croatia: topic selection and debunking routines at Faktograf.hr

dr. MATO BRAUTOVIĆ

Department of Communication, University of Dubrovnik

INTRODUCTION

As checking content shared online against the truality of the claims pre-sented in them is out of the scope of our research, we decided to lean our research (Brautovic, 2022a; 2022b; 2022c) on the established practice of using debunks created by fact-checking organizations as a starting point for further analysis. This approach raised some questions. Naimly, research conducted by Uscinski and Butler (2013) found that fact-checking is failing, among others, in its selection of disinformation for fact-checking, because it is not based on random samples, but contrary, on subjective decision of the fact-checkers. As such, the choice itself can be subjective and biased.

"...without explicit selection criteria, fact checkers' own biases would invariably affect their choice of which actors and which statements to check. The end result of this would be to make political actors look much more truthful or dishonest than they might actually be." (Uscinski, 2015, p. 244)

On the other hand, Michelle Amazeen (2015) critiqued the work of Uscinski and Butler (2013), noting that impeccable practice plays an important role in democracy. In line with Amazeen, and against Uscinski's harsh qualification, we wanted to explore the practices of Faktograf, as our further research is highly dependent on the selected sample.

To do so, we developed the following research questions:
- ▶ Rq1: How does Faktograf.hr select topics for debunking?
- ▶ Rq2: What tools are used to help fact checkers do their work?
- ▶ Rq3: How is the collaboration between Facebook and other platforms with fact-checkers?

METHODOLOGY

For this study, we used an online focus group as a research method, which was conducted on November 15th, 2021. The focus group consisted of four representatives of Faktograf.hr: Petar Vidov (editor-in-chief), Ana Brakus (executive director), Sanja Despot (deputy editor-in-chief) and Ivana Živković (communication editor). The focus group was led by two researchers, professor Nebojša Blanuša from the Faculty of Political Science, University of Zagreb, and Mato Brautović, professor from the University of Dubrovnik. Also present was researcher Matej Gjurković. The focus group started at 11:00 and ended at 12:32, and was conducted using the Zoom conferencing tool. The focus group protocol (see Annex) was initially developed by Marijana Grbeša, professor from the Faculty of Political Science, University of Zagreb, alongside professor Nebojša Blanuša and professor Mato Brautović.
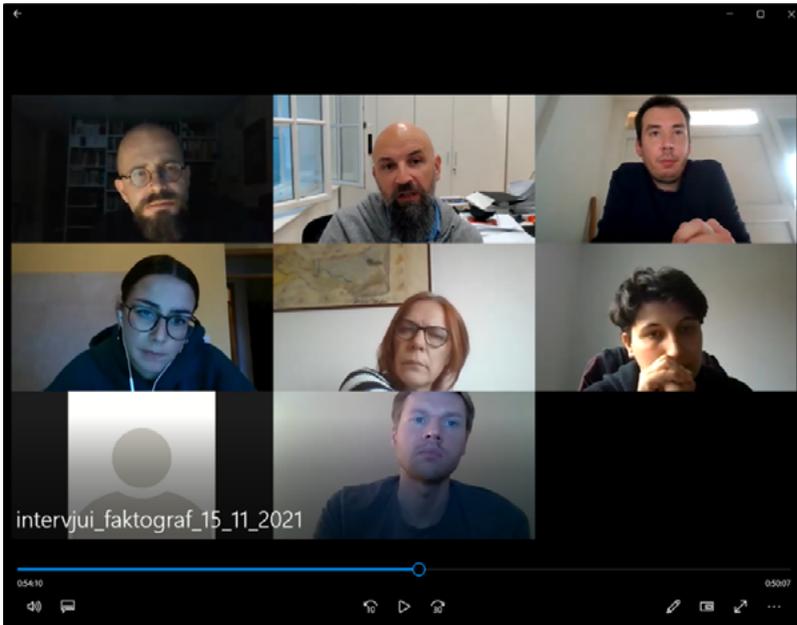
RESULTS

Topic selection & routines

The editor-in-chief of Faktograf is responsible for the selection of topics. As an everyday working activity, in the morning, the editor-in-chief routinely analyzes insights from Facebook, as well as from alternative, pseudo, and mainstream media. Usually, there are several trending disinformation and the editor-in-chief selects those to be debunked based on the following criteria:

- ▶ Prevalence of the disinformation
- ▶ Capacity for spreading
- ▶ Severity of the disinformation
- ▶ Influence on elections

Prevalence and capacity of the disinformation is determined based on data coming from Facebook's tools and editor in chief experience.

"As an editor, I follow what's happening online day by day, using some of the tools provided to us mainly by Facebook. With these tools, I can basically track what is going viral in Croatian. So, what is being shared and in what number, what has just arrived, so there is a big fast growth to reach other users. Based on that, I assess what the priorities are. And, of course, how serious this disinformation is. So we are looking at disinformation that are potentially dangerous to human health, vaccines, pandemics in general. And disinformation that can impact election campaigns. If someone is running an online campaign whose goal is to use disinformation to steer voters in a certain direction." (P. Vidov)

Part of debunkings were initiated by Faktograf's users, who can suggest the disinformation for the debunking. Faktograf introduced a new option for the users to suggest a topic for debunking in February 2020.

"From February 2020, we started collecting and recording user requests, and we created a dedicated section. And since we started collecting, we have published more than 300 debunkings based only on reader requests. And that was very useful at the beginning of the pandemic, because user queries were an indicator of how widespread something was, and it was hard to tell just from the numbers on Facebook." (I. Živković)

Faktograf's editor in chief was aware that his routine of selecting disinformation for debunking was a specific strategy, based on his experience about the damage of fear-arousing narratives to prevent viral dissemination of disinformation.

"At some point, I am going to make an assessment that we are going to look at something that's not as widely used yet because I think it has potential to be shared. The selection process itself is always a trade off of what is more important at a particular point in time when you are looking at something that has already become widespread. On the other hand, you may have the opportunity to deal with something that has not yet spread very widely, and in my experience so far, my guess is that it will, and then it would rather go after it to suppress the spread of that disinformation than to deal with something that has already spread widely because a lot of people have seen it. I can not change that. Basically, I make those kinds of assessments based on what kind of narrative it is and how it is conceived, for example, that something is going to kill you." (P. Vidov)

Tools used

Faktograf's fact-checkers use two software tools. The first is an interface created by Facebook that detects the spread of disinformation in the similar language area. This tool is available only to fact-checking organizations which signed the contract with Facebook. The second is the Crowd Tangle tool, which is used to spot the disinformation which became viral - transferring from marginal to mainstream.

The Editor in-chief is aware of the limitations of Facebook's tools, and he is hoping that EDMO will produce a general tool that will help fact-checkers to monitor all critical places online.

Facebook collaboration and other platforms

Faktograf is focused on disinformation on Facebook because it is the most popular social media platform in Croatia, while Twitter is too small, and YouTube does not provide support in conducting fact-checking.

"First, Facebook gives us some insights that help us do our jobs. No one else gives us access to it. Secondly, Facebook is the most popular social network in Croatia, there is no doubt about that. And now, theoretically, we could monitor some Telegram groups and find out what's going on there and deal with it, but that's a bit

pointless. Telegram has a limited reach. With Facebook, we can point out to people that they are seeing disinformation. That's the purpose of this program - to reduce the reach of disinformation. Once fact-checkers flag a piece of content as disinformation, the people who shared it receive a message from Facebook informing them that it is disinformation and directing them to the correct information. That's why the focus is on Facebook." (P. Vidov)

Faktograf is aware of limitations of cooperation with Facebook but they point to the damage caused by other social media platforms.

"The advantage is that we work with Facebook, and the disadvantage is that we work with Facebook. We just get some information, we get some data, actually a whole range of data, while we are not allowed to share some data. I would like to see us focus a little bit on other platforms that are doing almost the same damage. Lately, that's been YouTube in particular, which has done so much damage during the pandemic that it's just not normal, and it goes completely under the radar. They are not providing any information. It's completely unknown how their algorithm works." (A. Brakus)

Fact checkers are aware that YouTube removes the disinformation but without any explanation that is causing even more confusion.

"The video simply disappears, adding to the confusion and helping the conspiracy theorists, who then claim that their content was removed because it was true and escaped YouTube's scrutiny. They argue that YouTube censors found out at the last minute and removed it. So that creates total confusion, it's completely non-transparent." (A. Brakus)

CONCLUSION

Although the practice of fact-checking is limited, due to the standardization imposed by the International Fact-Checking Network (IFCN) and the partnership with the Facebook platform (Third-Party Fact-Checking Program), it represents a good starting point for conducting research that seeks to shed light on the phenomenon of disinformation. However, opening up other platforms, particularly YouTube and TikTok, would provide greater insight into the phenomenon. Based on the data collected in the focus group, we can conclude that the Faktograf.hr disinformation database is a reliable (and only) source for identifying the source of disinformation on Facebook and other platforms in Croatia.

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ANNEX — FOCUS GROUP PROTOCOL

SELECTION OF DISINFORMATION FOR DEBUNKING
- ▶ How is fact checking going, do you have any protocols?
- ▶ What channels/platforms do you debunk?
- ▶ How do you select disinformation for debunking, in terms of content and relevance of news, i.e. how do you select it?
- ▶ How do you ensure representativeness in the selection?

DEBUNKING PROCES
- ▶ What does the debunking process look like? Is it standardized?
- ▶ Describe for us the standard procedure.
- ▶ What sources do they use for debunking? How reliable are these sources on the basis of which they debunk the disinformation claims, and how do they evaluate them?
- ▶ Is there a standard form for what a debunking should include?

TOOLS
- ▶ Do you use a tool to detect disinformation? And, if so, which one?
- ▶ Describe any difficulties you have using different tools.
- ▶ How do you use the CrowdTangle tool to detect disinformation? Can you give us a glimpse of how you use it (print templates or similar)?

COLLABORATION WITH FACEBOOK
- ▶ What role does the partnership with Facebook play in detecting and debunking disinformation?
- ▶ Describe any difficulties you encounter when working with Facebook?

FOLLOW OF DEBUNKING
- ▶ Is there stigmatization of sources (channels, organizations, and individuals) as a result of your work?
- ▶ To what extent do you yourself contribute to the visibility of disinformation (e.g., when they single out insignificant 'news' stories that do not have a wide reach, but ensure that they become visible by publishing them on their channels)?

2

Mapping Covid-19 Disinformation Ecosystem in Croatia

dr. MATO BRAUTOVIĆ

Department of Communication, University of Dubrovnik

INTRODUCTION

From the beginning of our civilization, disinformation was threatening the individuals, political systems, economies and societies. Today we can speculate that we are facing the greatest amount of disinformation ever (Watson, 2022). In fact, the crisis around the Covid-19 created an environment for disinformation acceptance and enabled purveyors of disinformation to use social media and internet-based technologies for dissemination and amplification of the disinformation narratives and discourses.

This study is trying to address the Covid-19 disinformation spreading in Southeast Europe (Croatia) as the phenomenon which is under researched and without a Croatian focus. The research conducted by Cvjetićanin et al. (2019) found that more than 60% of analyzed false or misleading media content in Bosnia and Herzegovina was political. Also, they found that their disinformation ecosystem consisted of two types of purveyors of disinformation: opportunistic and political actors. The opportunistic actors were sharing disinformation for financial gain, and political actors were using mainstream media for spreading disinformation to advance their political agenda. Cvjetićanin et al. (2019, p. 8) found that "…high number of media from neighboring countries…with BiH-based media outlets, using each other as sources and redistributors of disinformation…formed a large disinformation "hub", used by local and possibly foreign political actors to influence public opinion in BiH and the region with considerable regularity and frequency."

These findings were confirmed with results from the structural evaluation of the global Covid-19 disinformation network that detected the presence of distinct language communities, among others, in interrelated South-Slavic languages (Serbian, Croatian, Bosnian, Slovenian) but without further elaboration (Burns et al., 2020, p. 25).

Similar to previous studies, Green et al. (2021, p.6) claimed that most dominant purveyors of Covid-19 disinformation in SEE were domestic actors, while the presence of foreign actors were limited and they all aimed "to undermine the credibility of the European Union in the Western Balkans".

"The Covid-19 pandemic has provided fertile ground for disinformation. Governments throughout the Western Balkans have sought to falsify their record on handling the pandemic, while others have injected many of the same false claims found elsewhere. In addition, China and, to a lesser extent, Russia, have used the pandemic as an opportunity to build leverage in public opinion, at the expense of the EU." (Green et al., 2021, p.6)

Drawing on these findings, we developed the following research questions:

▶ RQ1: Who are the online purveyors of Covid-19 disinformation in Croatia (users, accounts, pages and websites)?

▶ RQ2: If the Covid-19 disinformation ecosystem has formed in Croatia, what kind of structure does it have and how does that structure amplify the transcendence of disinformation?

▶ RQ3: How does the online Covid-19 disinformation ecosystem differ from the general Covid-19 information ecosystem?

For the purpose of this report, we used the term disinformation, which is defined as verifiably false, or misleading information, that was created and/or disseminated and may cause harm.

METHODOLOGY

For this study, we used a mixture of methods to retrieve and analyze two samples of data: Content Analysis, Social Network Analysis, and Visual Network Analysis. These methods were used to study the networks of URL exchanges that allowed us to map "…communities of pages, groups, and profiles that promoted similar content" (Bruns et al., 2020, p. 15). In terms of the network of URLs,the vertex (node) represents the page, group, or profile, while the edge (links) represents the relationships or interactions that connect them.

The first dataset was collected using the snowball method from the collection of URLs found on Faktograf's blog about Covid-19 disinformation. A total of 540 fact check URLs (N=540) were collected for disinformation published from January 1, 2020 to December 31, 2021. Based on this URL list, manual content analysis was performed and the original (still active) 253 disinformation URLs (N=253, 47%) were identified. We then used Crowd-Tangle to collect Facebook data on URLs leading to fact checks and disinformation. The result was a dataset with 5128 edges (N=5128) and unique 1528 vertices (N=1528).

The second dataset was collected using CrowdTangle to retrieve public Facebook posts with the query (kovid, koronavirus, coronavirus, covid-19, and covid19) in Croatian, Serbian, Bosnian, Macedonian, Slovenian, and Montenegrin posted from January 1, 2020 to December 31, 2021. The dataset was then reduced to posts with links (79% of all collected posts contained links) that had 10 or more shares to reduce the sample for analysis. In the end, the analyzed sample had 23081 edges (N=23081) and unique 5640 vertices (N=5640).

Social network analysis and visual network analysis were performed for both datasets and for this purpose we used NodeXl software. The visualization was created using the Harel-Koren Fast Multiscale algorithm[1], clusters were colored with different colors and connections (shared URLs) were colored from orange to purple depending on the weight of the relationship (number of shared URLs). The size of the vertex was scaled based on the between-ness centrality measure (measure of the vertex's influence in spreading information on social networks), and only the most influential vertices (the top 30 vertices) were given labels. Since the same sources (organizations or individuals) usually have multiple sources such as websites, Facebook pages, and similar web domains, we used the same names/labels to reduce them to the same source whenever it was possible to determine. For example, Faktograf had both a website and a Facebook page, which were referred to as Faktograf and used as a single cornerstone. In cases where it was difficult to determine the relationship between the outlets, we left them as they were. For example, in the case of the Matrix Facebook page and the Matrix YouTube channel, it was impossible to establish the connection.

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1   Algorithm used for visualization of SNA that forces closely connected vertices to be plotted near.

RESULTS

The overview of network structure coming from the first dataset showed that Covid-19 disinformation ecosystems consists of 18 interconnected clusters through which dominate three major clusters (G2, G3, and G4), whose members were different pages, groups and verified profiles, extending beyond Facebook borders to YouTube and different alternative and mainstream media websites. The ecosystem had supranational nature (covered the whole SEE region and beyond) by covering whole Balkans (Bruns et al., 2020) with dominance of Serbian sources. These Covid-19 disinformation clusters had community characteristics, in the center of which were alternative media (G2 - 2012 Transformacija svijesti[2] & G4 – logicno.com[3]), or influential individuals (G3 – Marija Stojaković[4]). Other clusters have broadcasting (star-shaped) distribution with individuals (G1 – Marina Brekalo[5]) or organizations (G5 - Faktograf, G6 - V1 Info[6], G7 - RamsesThePigeon[7], G8 - Alfa & Omega[8], G9 Pravo na slobodu[9] & G10 - Suverenisti[10]) in the center. In these clusters communities were partially formed and vertices have minimal interaction between themselves.

Analysis of the clusters shows that clusters G2, G3 and G4 were highly interconnected, while others were at the edges of the disinformation ecosystem. These clusters had a tight crowd format and were characterized with a diversity of opinions around Covid-19, but relied on similar sources of information. Also, all clusters have small average geodesic distance[11] what

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2   2012 Transformacija svijesti is an alternative medium with Facebook page that follows 200.000 people and has highest reach in SEE (Zablocki, 2020).

3   Logicno.com is a pro Russian alternative medium register in Bosnia and Herzegovina (Marković, 2022).

4   Marija Stojaković is disinformation blogger from Serbia whose content is regularly debunked by regional fact checkers (Perić, 2020).

5   Marina Brekalo is a member of the Croatian diaspora in Austria that has a Facebook profile whose post with video about protest against Covid-19 measures in Vienna became viral https://www.facebook.com/707628162708190/posts/2456910027779986.

6   V1 info is Facebook page from Sremska Mitrovica in Serbia.

7   RamsesThePigeon is Youtube channel.

8   Alfa & Omega is Catholic Facebook group with 25.000 followers.

9   Pravonaslobodu.com is an alternative medium from Serbia with Facebook page that follows 103.000 people.

10   DJB (Dosta je bilo) Suverenisti is Facebook page of political organization from Serbia with 139.000 followers.

11   The average geodesic distance represents the shortest path between two vertices in the cluster. The average online geodesic distance is 6,41 (Franceschet, 2022) and in case of purveyors of Covid-19 disinformation in SEE it is in the range from 1,830 to 3,471.

Figure 1: Social network analysis of Covid-19 disinformation ecosystem

can be interpreted as they represent the spaces where disinformation can spread fast (Franceschet, 2022)

Cluster G5, which was formed around only the Croatian fact-checking organization Faktograf, had a broadcasting structure where many vertices repeated Faktograf's content as a form of criticism of their work. Although the analyzed data set was heavily skewed on the side of Faktograf, the analysis revealed that almost 62% (N=546) of all edges in G5 cluster were self-loops or Faktograf's Facebook page sharing links to Faktograf's website (Tabel 1).

Cluster	Vertices	Unique Edges	Edges With Duplicates	Total Edges	Self-Loops	Average Geodesic Distance[12]	Graph Density[13]
G1	365	321	131	452	2	2,011	0,003
G2	293	523	499	1022	29	3,155	0,008
G3	202	224	133	357	4	2,852	0,007
G4	199	283	181	464	19	3,471	0,008
G5	124	104	776	880	546	2,317	0,008
G6	122	108	47	155	0	2,162	0,008
G7	54	52	2	54	0	1,927	0,019
G8	36	35	0	35	0	2,219	0,028
G9	35	29	14	43	4	2,511	0,029
G10	23	20	4	24	0	1,830	0,043

**Table 1:** Top 10 clusters statistics

The detailed visualization (ego-network including friends of the friends) of the clusters G5 and G2 (Figure 2) further confirmed the characteristics of these clusters, where G5 had broadcast structure, and G2 had community structure. Broadcast structure means that communication is one-way oriented from center to periphery of the cluster, and community structure means that members of the cluster have certain interests in common and they are interconnected.

Based on SNA metrics we identified two distinguished groups of purveyors: the influential vertices and super-spreaders. The influential vertices were pages/groups/profiles whose content (URLs) was most shared, and super-spreaders were vertices who were sharing others' content the most often. The super-spreaders were sharing links to alternative media, mainstream media and individuals, but this communication was mainly

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12   The average shortest path between two vertices in the network.

13   The proportion between the number of the edges in a cluster or network and the maximum number of edges that cluster or network theoretically can have. The more edges the cluster or network have, the graph density is lower.
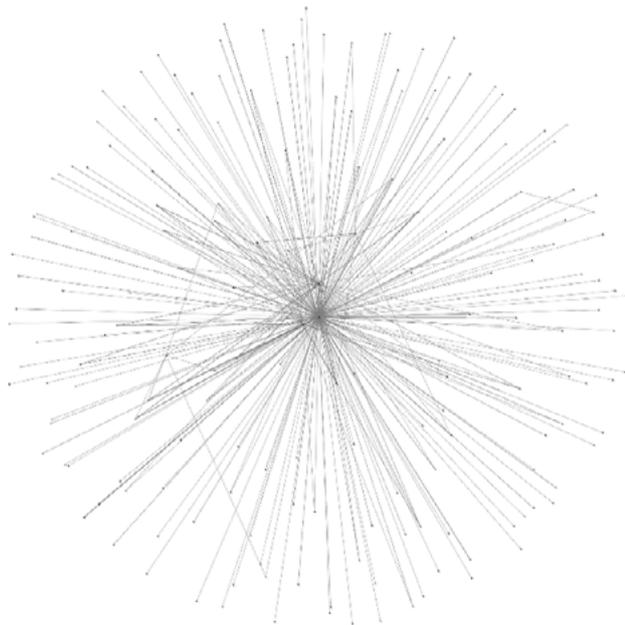
G5 – Faktograf
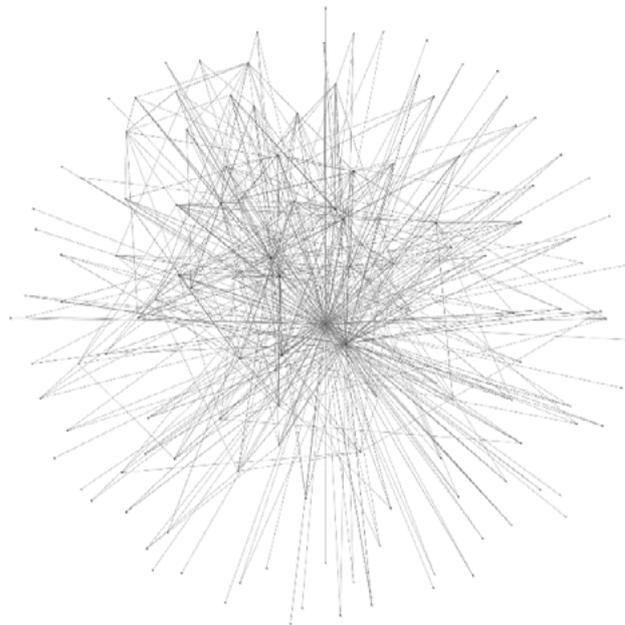
G2 – 2012 Transformacija Svijesti

one-way and was in function of sharing (confirming) their narratives and discourses. As Table 1 shows, only rare vertice (2012 Transformacija Svijesti) were present in the both lists. The list of the most influential vertices dominates with individuals (Marina Brekalo, Marija Stojaković, Bojan Bozović, Petar radenić, Toni Dragičević, Davor Cupar), and alternative media (V1 info, Logično, 2012 Transformacija Svijesti, Istinom protiv laži, HOP portal, Fash. hr), while super-spreaders were mainly Facebook groups and pages linked to anti-system parties/politicians (Narodni Referendum, Glavna grupa stranke Ivana Pernara, Grupa podrške Ivana Pernara, Hoćemo Mislava Kolakušića kao ministra pravosuđa i policije!, Grupa potpore Karolini Vidović Krišto), and conspiracy theories (Saznajmo istinu o Koroni, Istina.info.nova, Borba Protiv Okupacije, Krešimir Mišak-Na Rubu Znanosti, Promijenite Svoju Svijest).

The most influential (in-degree)	Super-spreaders (out-degree)
1. Marina Brekalo	1. Narodni Referendum
2. Marija Stojaković	2. Saznajmo istinu o Koroni
3. Faktograf.hr[14]	3. Glavna grupa stranke Ivana Pernara
4. V1 info	4. Istina.info.nova
5. Logično	5. Grupa podrške Ivana Pernara
6. 2012 Transformacija Svijesti	6. Borba Protiv Okupacije
7. Bojan Bozovic	7. Poštovaoci lika i djela dr Branimira Nestorovića
8. Petar Radenić	8. FORUM
9. Istinom protiv laži	9. Hoćemo Mislava Kolakušića kao ministra pravosuđa i policije!
10. Flash.hr news portal	10. 2012 Transformacija Svijesti
11. Matrix	11. Krešimir Mišak-Na Rubu Znanosti
12. Inicijativa Prava i slobode	12. NAJBOLJA HRVATSKA
13. ALFA & OMEGA	13. Vučić te laže ne veruj šta ti kaže
14. RamsesThePigeon	14. NEĆU DA NAM OPANČARI I DIJASPORA KROJE SUDBINU U DOMOVINI
15. Michael Poulsen	15. Promijenite Svoju Svijest
16. HOP portal	16. Руске вести
17. BALKAN INFO RATNIK	17. Grupa potpore Karolini Vidović Krišto
18. Toni Dragičević	18. POTPORA HRVATSKOM NOVINARU MARKU JURIČU
19. Matrix TV	19. Српско-руско братство - духовно и историјско
20. Davor Cupar	20. CORONA-NE BOJTE SE CORONE KORUMPIRANI POLITIČARI SU OPASNI PO ČOVJEKA

Table 2: Top 20 the most influential and super-spreaders pages, groups and verified users

14   It should be noted that Faktograf.hr was part of the ecosystem but NOT a purveyor of Covid-19 disinformation.
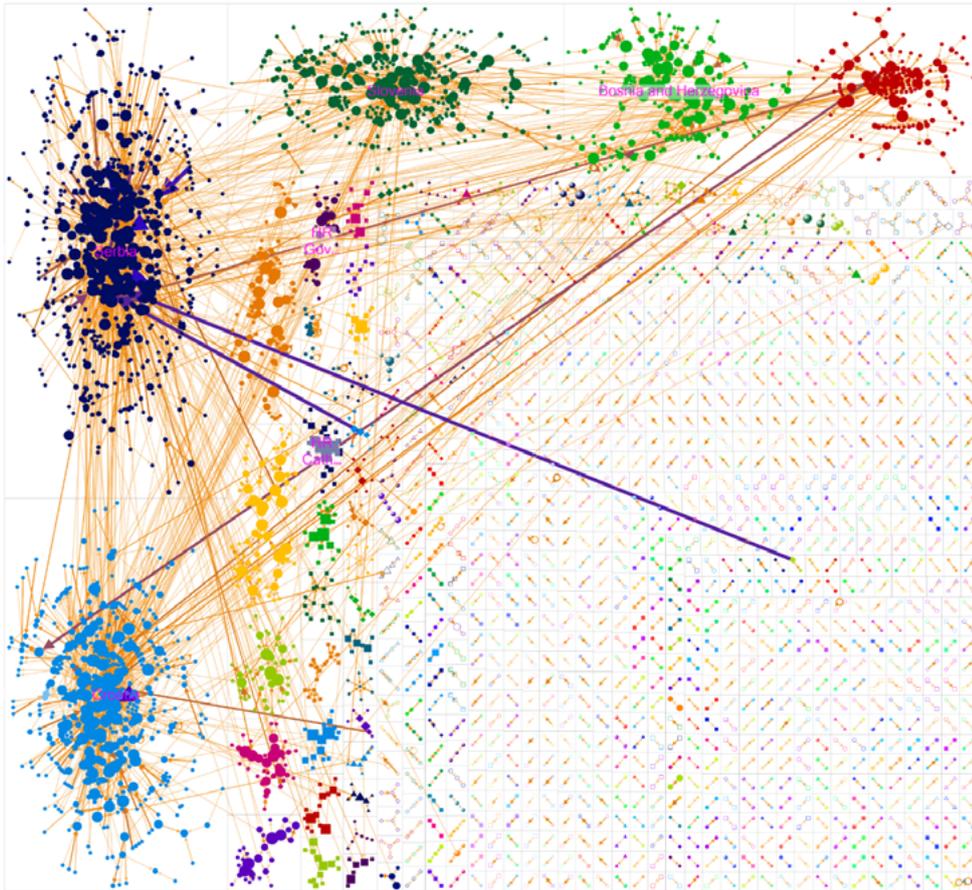
Figure 3: Social network analysis of Covid-19 information ecosystem

Opposite to the first dataset, the findings showed presence of community clusters which were formed around several hubs that have different audiences and sources of information (Smith et al., 2014). As visualized in Figure 3, the community clusters about Covid-19 were formed on the national (Serbian, Croatian, Slovenian, Bosnian, et.) level. Also, on the Croatian national level we detected the presence of polarized clusters formed around official Covid-19 sources (government), religion (Catholics) and (dis)information (mainstream media, alternative media, purveyors of Covid-19 disinformation, etc.). The polarized crowd structure means that two opposite groups almost do not interact with each other, that they share different sources (URLs) and use different hashtags and words (Smith et al., 2014). The clusters formed around official sources were smaller in size, more dense and with shortest cascading.

The members of the (dis)information cluster were well known purveyors of Covid-19 disinformation (2012 Transformacija svijesti, Grupa podrške sucu Mislavu Kolakušiću, Logicno.com, flash.hr, Glavna grupa stranke Ivana Pernara, Narodni Referendum, and Grupa potpore Karolini Vidović Krišto), and mainstream media (jutarnji.hr, 24sata.hr, index.hr, slobodnadalmacija. hr, vecernji.hr, hr.n1info.com, tportal.hr, rtl.hr, and etc.). The members of the government cluster were the Croatian Government, Croatian Institute for Public Health, Ministry of Science and Education, Prime Minister Andrej Plenković, Croatian Society for Infectious Diseases of Croatian Medical Association, and etc. The Croatian Catholic cluster consisted of the Croatian Catholic Network, Croatian Catholic News Agency, Laudato TV, Croatian Bishop Association, Book.hr, and etc.

(DIS)INFORMATION	GOVERNMENT	DOMINANT RELIGION
1. 2012 Transformacija Svijesti	1. hzjz.hr	1. hkm.hr
2. jutarnji.hr	2. Ravnateljstvo civilne zaštite MUP RH	2. ika.hkm.hr
3. 24sata.hr	3. koronavirus.hr	3. Kuća susreta Tabor
4. Grupa podrške sucu Mislavu Kolakušiću	4. vlada.gov.hr	4. Riječka nadbiskupija
5. Gordan Lauc	5. Cijepljenje-pravo izbora	5. Ivan Dominik Iličić
6. index.hr	6. civilna-zastita.gov.hr	6. laudato.hr
7. logicno.com	7. mjera-orm.hzz.hr	7. glas-koncila.hr
8. Udruga Glas poduzetnika	8. poljoprivreda.gov.hr	8. Hrvatski katolički radio
9. slobodnadalmacija.hr	9. Petar Škorić	9. hbk.hr
10. vecernji.hr	10. cijepljenje.info	10. zg-nadbiskupija.hr
11. Koronavirus Hrvatska-COVID19-savjeti i informacije	11. eudigitalnacovidpotvrda.hr	11. O Isuse ljubavi moja
12. flash.hr	12. hdib.hr	12. book.hr
13. nacional.hr	13. mzo.gov.hr	13. laudato.tv
14. Glavna grupa stranke Ivana Pernara	14. shu.hr	14. Fra Mario Knezović
15. Narodni Referendum	15. Andrej Plenković	15. Internet Radio Božje Milosrđe
16. Grupa potpore Karolini Vidović Krišto	16. CroStuttgart	16. Karmelićani-Split
17. hr.n1info.com	17. Grad Kastav	17. Kršćanska sadašnjost
18. tportal.hr	18. Grad Varaždin	18. Stjepan Ivan Horvat
19. Saznajmo istinu o Koroni	19. Hrvati u Dijaspori	19. Veritas-Glasnik sv. Antuna Padovanskoga
20. rtl.hr	20. Koronavirus na području grada Čabra	20. Župa Bošnjaci

Table 3: Croatian major clusters discussing Covid-19 ranked by betweenness centrality

The Croatian (dis)information cluster was 17 times larger than the government cluster and had 75,6 times more edges (shares) than the government one (Table 4).

Cluster	Vertices	Unique Edges	Edges With Duplicates	Total Edges	Self-Loops	Average Geodesic Distance	Graph Density
(Dis)information	582	711	3970	4681	98	4.354	0.003
Government	33	25	37	62	0	4.496	0.030
Catholics	25	19	57	76	0	3.533	0.042

Table 4: Croatian clusters statistics

CONCLUSION

Purveyors of Covid-19 disinformation formed supranational disinformation ecosystems consisting of different social media pages, channels, groups, and profiles, including alternative and mainstream media websites originating beyond Croatian national border to the rest of the SEE region. In the center of the SEE disinformation ecosystem were few highly interconnected community clusters, which represented the spaces where disinformation can spread quickly, formed around alternative media hubs (2012 Transformacija svijesti, Logicno.com) and blogger (influencer) (Marija Stojaković). On other hand, the cluster formed around Croatian fact-checking organization Faktograf had a broadcasting structure with a high number of edges as self-loops or results of back-fire effect.

Detail analysis revealed that the majority of vertices fit into two distinguished groups of purveyors: the influential vertices and super-spreaders where the first group creates content and second shares links to alternative media, mainstream media, and individuals.

Opposite to the disinformation ecosystem, the findings about general discussions on Covid-19 showed presence of communities on national level with different audiences and sources of information (Serbian, Croatian, Slovenian, Bosnian, etc.). Detailed analysis of Croatian linking practices detected the presence of polarized clusters formed around official Covid-19 sources (government), religion (Catholics) and (dis)information (mainstream media, alternative media, purveyors of Covid-19 disinformation, etc.) sources.

Based on these findings we can conclude that purveyors of Covid-19 disinformation in SEE use social media and the internet more effectively for distribution and amplification of their narratives and discourses than the government. Also, to fully understand the phenomenon, the research has to be extended to the role of mainstream media in spreading disinformation in particular use of clickbait headlines, error correction practices, fact-checking routines and practices, etc.

LIMITATIONS

The data collected using CrowdTangle data comes only from public posts published on pages, public groups and verified profiles and represents up to 2% of all the posts published on the topic (Donovan, 2020). Also, the data collected for the purveyors of Covid-19 disinformation is limited only to actors/content available at the time of the research (December 2021).

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3

Dynamic Network Analysis of Covid-19 Related Disinformation Ecosystem in Croatia

dr. MATO BRAUTOVIĆ

Department of Communication, University of Dubrovnik

INTRODUCTION

To better understand the phenomenon of disinformation spreading, we need to understand the dynamic behavior of actors of the disinformation ecosystem, especially in the form of structural changes over the time (Zaidi et al., 2014). Therefore, on data collected as part of social network analysis of Covid-19 disinformation ecosystem in Croatia (Brautović, 2022) we applied the dynamic network analysis (DNA), with aim of understanding how the ecosystem evolved through two years period, what kind of structural changes happened, who were influential actors that facilitate development of the system, and its survival characteristics during the observed time.

DNA represents a holistic approach of studying and analyzing interconnectedness networks which are evolving during the passage of time. These processes are an outcome of internal and external factors (Zaidi et al, 2014). In the case of the Covid-19 disinformation ecosystem, the internal factor that changed it could be the end of the pandemic or withdrawal of the actors. The external factors could be strategies and approaches taken by platforms (Facebook) to detect and restrict their activities.

METHODOLOGY

The dynamic patterns can be analyzed through their properties (Burch et al., 2011) by visualizing the ecosystem over the time as a single (whole) static[15] network (Zaidi, 2014) and by dividing it into vertex[16] level (ego network) for better understanding actors' roles. For visualization we broke the Covid-19 disinformation network graph into time-steps graphs[17], based on the four waves of Covid-19 pandemic in Croatia that occurred in these periods:

▸ 1st wave: February 29th, 2020 - September 30th, 2020
▸ 2nd wave: October 1st, 2020 - February 28th, 2021
▸ 3rd wave: March 1st, 2021 – July 31st, 2021
▸ 4th wave: August 1st, 2021 - December 31st, 2021

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15   Static network is network of interconnections during the whole analyzed period and dynamic network is network of interconnections during shorter periods that repeats (Udine et al, 2011).

16   Vertex or node represents actors or purveyors of Covid-19 disinformation. In SNA it's visualized as a dot in the graph.

17   Time-step represents the time period that covers the visualization and metrics on which the whole analyzed period is divided. Usually can be day, week, month or, as in our case, the pandemic wave.

Time window[18] used for aggregating each subgraph was different as it was based on the duration of the pandemic waves. The animated visualization of the Covid-19 disinformation ecosystem is available here.

The dataset was collected using snowball method from the collection of the URLs found on Faktograf's[19] blog about Covid-19 disinformation[20]. A total of 540 factcheck URLs (N=540) were collected, for the disinformation which were published in the period from January 1, 2020 to December 31, 2021. Based on that URL list, the manual content analysis was conducted and original (still active) 253 disinformation URLs (N=253, 47%) were determined. Afterwards, we used CrowdTangle to collect Facebook data about URLs leading to fact checks and disinformation, resulting in a dataset containing 5128 edges (N=5128) and unique 1528 vertices (N=1528).

The visualization was created using the Harel-Koren Fast Multiscale algorithm[21], clusters were colored with different colors and connections (shared URLs) were colored from orange to purple, depending on the weight of the relationship (number of shared URLs). The size of the vertice was scaled based on the betweenness centrality measure (measure of influence of vertice in dissemination of the information in social networks), and labels were added only to the most influential vertices (top 30 vertices). As the same sources (organizations or people) usually have multiple outlets like websites, Facebook pages and similar web spaces, we applied the same names/labels to reduce them to the same source, whenever it was possible to determine so. For example, Faktograf had both a website and Facebook page, which were labeled as Faktograf and used as a single vertice. Where it was hard to determine the relationship between outlets we left it as it was. For example, for the Facebook page Matrix and Youtube channel Matrix TV it was impossible to establish the connection.

18   Time window represents the time period of the time-step. In our case the time window is the pandemic wave.

19   Faktograf.hr is the only Croatian fact-checking organization and part of the project consortium.

20   https://faktograf.hr/live-blog-dezinformacije-o-koronavirusu/

21   Algorithm used for visualization of SNA that forces closely connected vertices to be plotted near.

Drawing on above mentioned, we developed the following research questions:

▶ RQ1: Who were the actors of the Covid-19 disinformation ecosystem around which the main clusters of purveyors of Covid-19 disinformation were formed?

▶ RQ2: What were the SNA metrics differences during the two-year period?

▶ RQ3: How did the dynamic patterns evolve during the two-year period?

▶ RQ4: How did the morphology of ego-networks of the most influential and super-spreaders purveyors of Covid-19 change during the time?

RESULTS

The snapshot of the Covid-19 disinformation ecosystem taken in January 2020 revealed that main vertices, around which later the leading (dis)information clusters were formed, were older vertices Marija Stojaković, 2012 Transformacija svijesti, Logicno.com and Faktograf.hr. It is a case of "Matthew effect" where "...public figures and users with older accounts have a higher probability of acquiring and maintaining an influencer status on social media platforms" (Leal,).

Table 1 shows that the number of vertices increased with the first case of Covid-19 in Croatia, introduction of lockdown and parliamentary elections. On the other hand, opening of the country after lockdown and end of the elections had a calming effect on the number of actors (vertices) and number of shared URLs (edges). During lockdown and parliamentary elections the ecosystem became more complex (average path length) as it involved more actors who were sharing and creating more content (average degree). Creation of the clusters were more prominent in March 2020 and July 2020. We can speculate that it was the result of the involvement of political actors who found the Covid-19 narrative as a way of promoting their cause.

Marija Stojaković

Logično

Faktograf.hr

2012. Transformacija svijesti
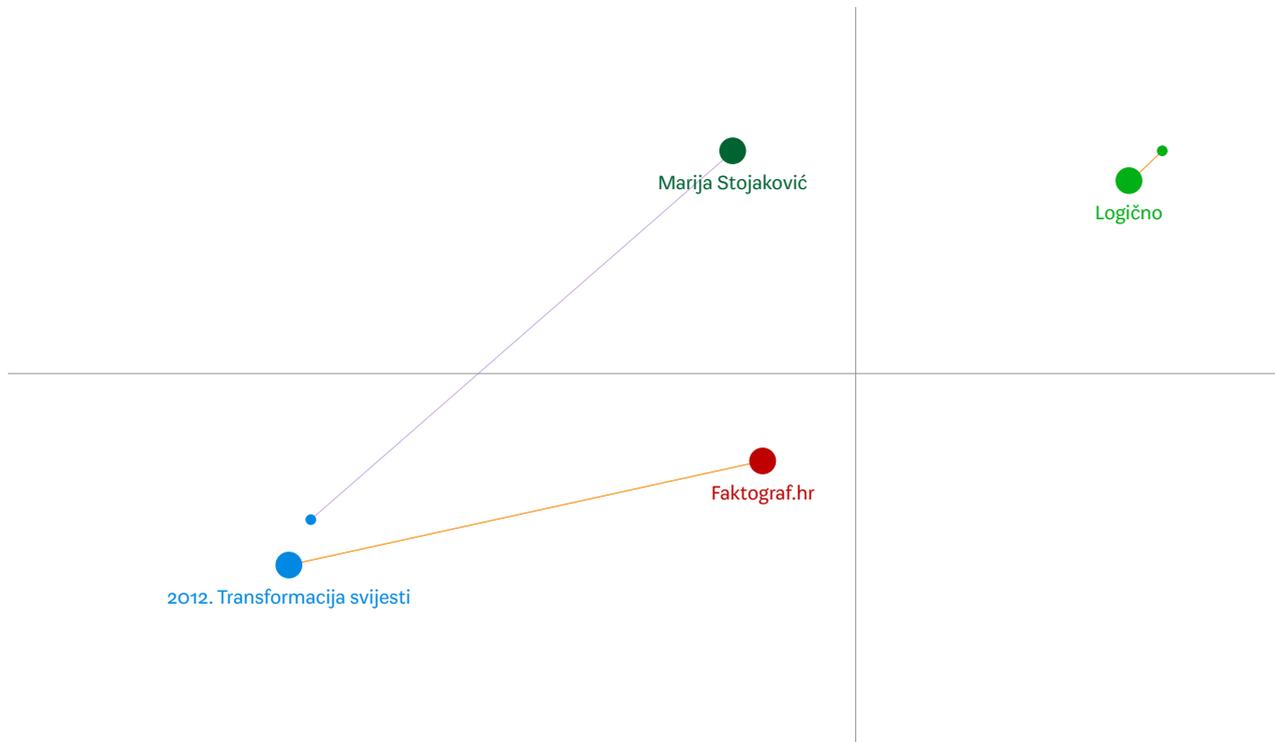
	Vertices	Edges[22]	Average path length[23]	Average degree[24]	Average clustering coefficient[25]	Events
January 2020	6	5	0,5	0,667	0,000	The first reports about Covid-19
February 2020	39	46	1,706013	0,949	0,000	The first case of Covid-19 (February 25, 2020)
March 2020	121	200	3,192548	1,041	0,004	Lockdown (March 19, 2020- April 27, 2020)
April 2020	214	390	3,288583	1,248	0,000	
May 2020	78	120	3,068801	1	0,000	Opening
June 2020	183	298	2,942148	1,066	0,001	Campaign for parliament elections
July 2020	225	515	3,30334	1,511	0,026	Croatian parliament elections (July 5, 2020)
August 2020	108	179	2,963123	1,093	0,000	
September 2020	188	311	3,475368	1,266	0,006	High number of the cases as result of taking down of all of the epidemical measures during the summer

Tablica 1: Evolucija ekosustava dezinformacija o COVID-u 19 tijekom 1. vala pandemije.

The number of involved vertices differ during four observed periods, with the highest number of the vertices in the 1st wave, and the smallest in the 3rd wave. Similar pattern was present in the total number of edges (connections). Beyond expectations, the most coherent structure of the disinformation ecosystem was during the 4th wave with the highest modularity (0,388575), and the smallest average geodesic distance (3,172014). It is probable that this last result was heavily influenced with the introduction of the cluster around the Marine Brekalo vertex.

22   Edge represents connection or relationship between two vertices. In our case it is sharing someone's link.

23   Average path length represents the average number of steps that a message needs to cross from one side of the network to the other side.

24   Average degree represents the average number that someone shared the vertex's link.

25   The measure of degree that vertices incline to group.

	1st wave	2nd wave	3rd wave	4th wave
Vertices[26]	710	459	222	676
Unique Edges[27]	915	702	281	774
Edges With Duplicates	1098	570	208	530
Total Edges	2013	1272	489	1304
Self-Loops[28]	246	144	88	129
Maximum Geodesic Distance (Diameter)[29]	9	8	8	8
Average path length	3,478436	3,464873	3,728807	3,172014
Graph Density[30]	0,002308	0,004024	0,006502	0,001972
Modularity[31]	0,325377	0,286025	0,277968	0,388575

Tablica 2: Usporedba SNA metrike kroz četiri vala pandemije COVID-a 19

Visualization in figure 3 was created as "Flipbook"[32] and showed that snapshots taken in different times during the two-year period had stable structure in the form of interconnectedness and organization of main clusters. The graph was only moderately changed in November 2021 with establishment of new vertex Marija Brekalo and clusters around her. Although the new vertices were established, the network structure and cluster organization stayed relatively stable.

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26   Vertex or node represents the actors in the network.

27   Edge represents a connection or relationship between two vertices.

28   Number of the times that vertex shared its own link.

29   Maximal distance between two vertices in the network.

30   Ration between the number of edges in the network and maximum possible considering the size of the network.

31   Strength of division of a network into clusters.

32   Edges are dynamic while vertices maintain a fixed position (Zaidi et al, 2014).
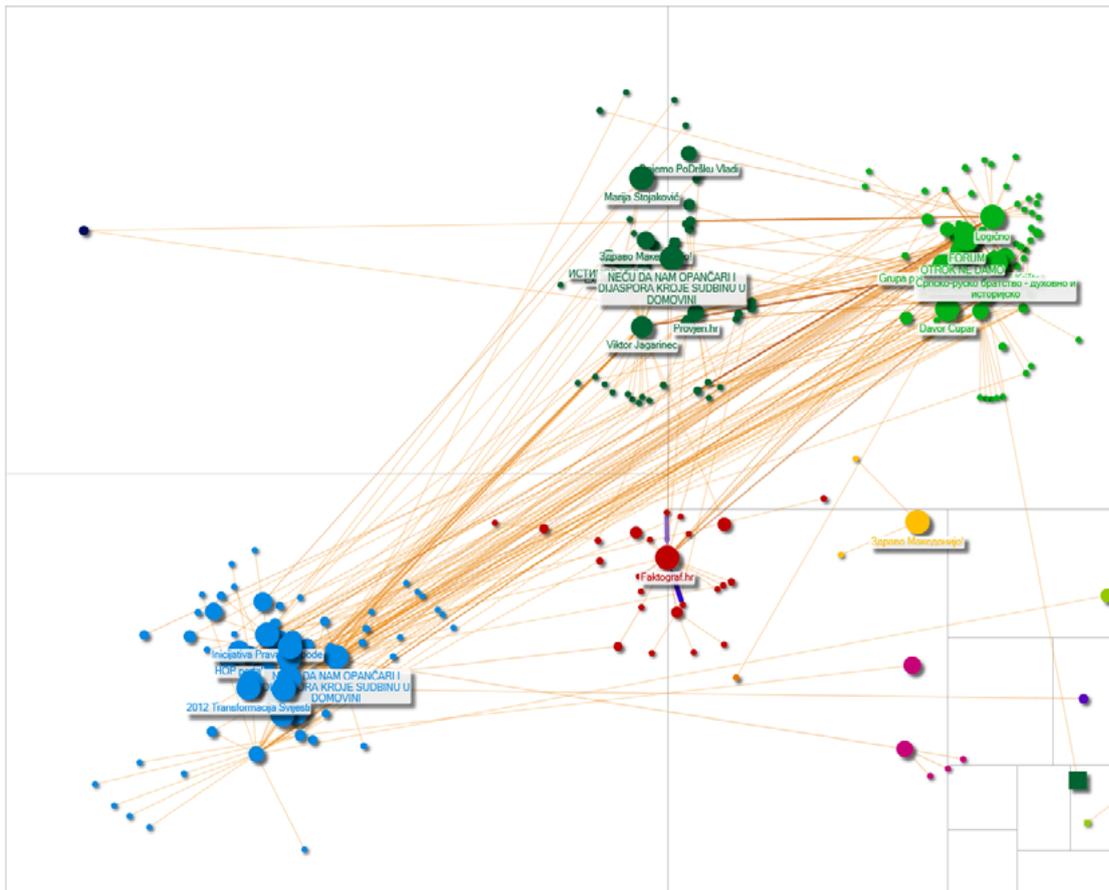
Figure 3: Development of the disinformation ecosystem (1st wave)

Figure 3: Development of the disinformation ecosystem (2nd wave)

Figure 3: Development of the disinformation ecosystem (3rd wave)
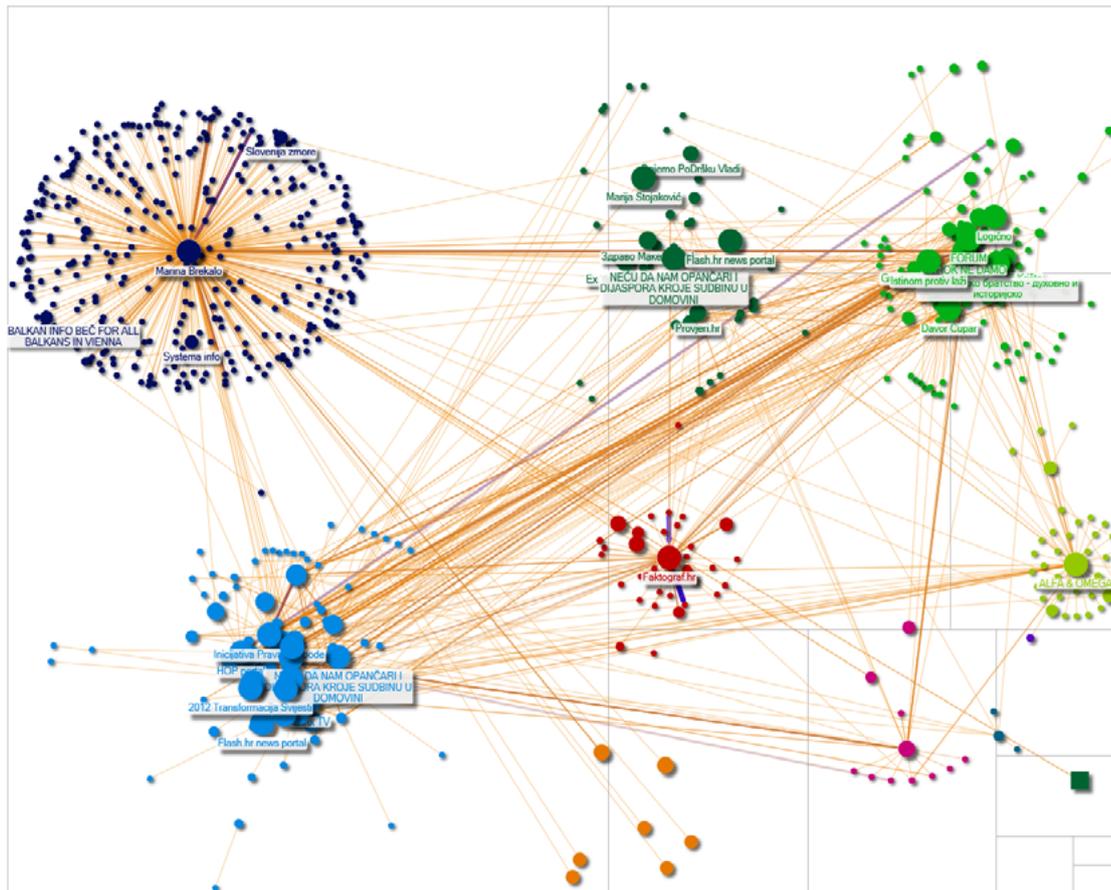
**Figure 3:** Development of the disinformation ecosystem (4th wave)

Opposite to previous, on vertex level the data showed (Figure 4) that, except Faktograf.hr and Logicno.com, all other subsequent graphs had an unstable pattern. During the four waves of Covid-19 pandemic they changed the structure and showed trends of changing edge density and patterns. For example, the network of vertices around 2012 Transformacija svijesti in the first two waves had a tight community structure which was later reduced in the number of edges and complexity. Similarly, Marija Stojaković had broadcasting structure in the first two waves that changed later when her presence was almost not existent. Stojaković's role was replaced by Marina Brekalo in the 4th wave, who formed a new broadcasting cluster around her. Similar to Stojaković, the super-spreaders Saznajmo istinu o Koroni and Glavna grupa stranke Ivana Pernara were silenced in 3rd and 4th wave. Opposite to them, super-spreaders Narodni Referendum and Istina.info.nova became more active after the first wave.

Although on the level of single vertex the Covid-19 disinformation network showed relatively high level of instability, the disinformation ecosystem possessed a dynamic morphing feature, acting as a superorganism[33] (term borrowed from biology), while attempts to survey strategies of mitigating techniques were performed by platforms and fact-checking organizations. The survival strategies, among others, include re-establishment/re-structuration of vertex (2012 Transformacija svijesti), late introduction of new vertex (Marina Brekalo), and morphing (Narodni Referendum, Istina.info.nova).
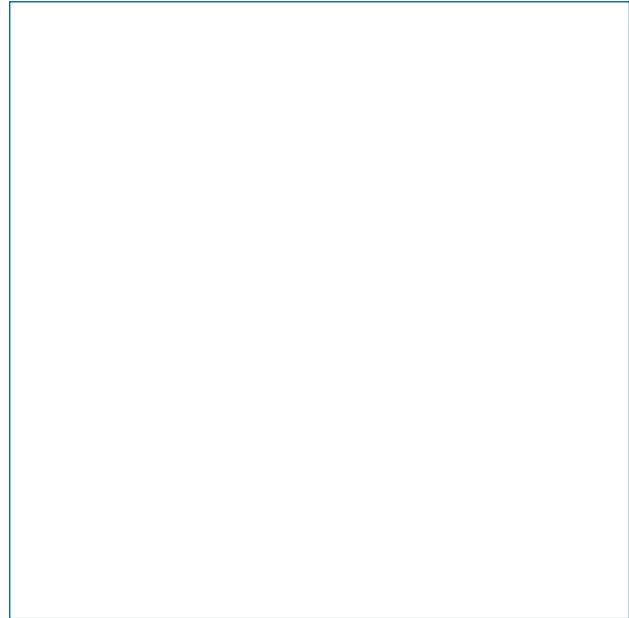
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[33] The superorganisms are formed from many individual and different organisms and have functional organization that helps them to persist through the time.
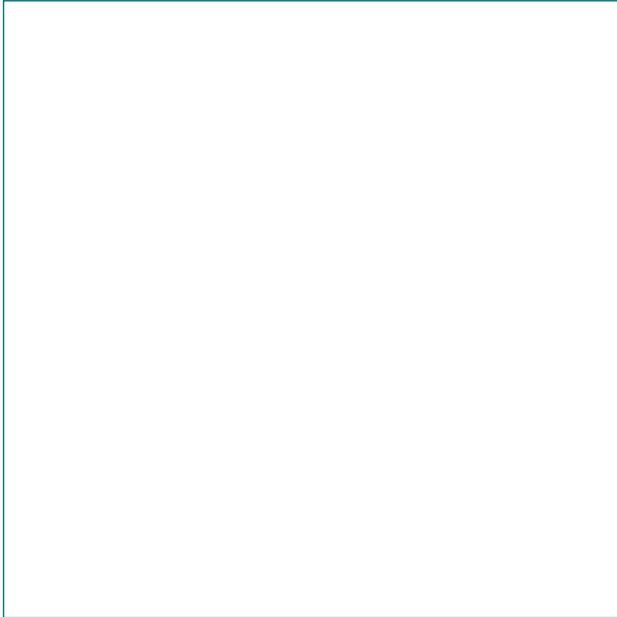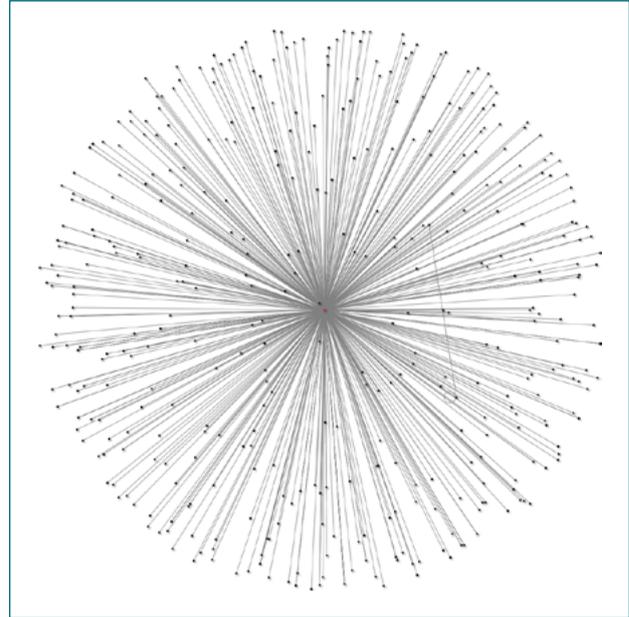
Marina Brekalo
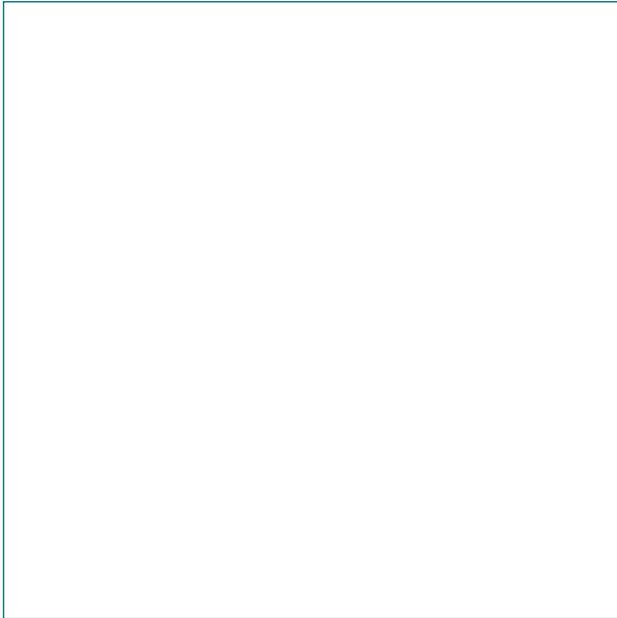
1ˢᵗ wave

2ⁿᵈ wave

Marina Brekalo

3rd wave

4th wave
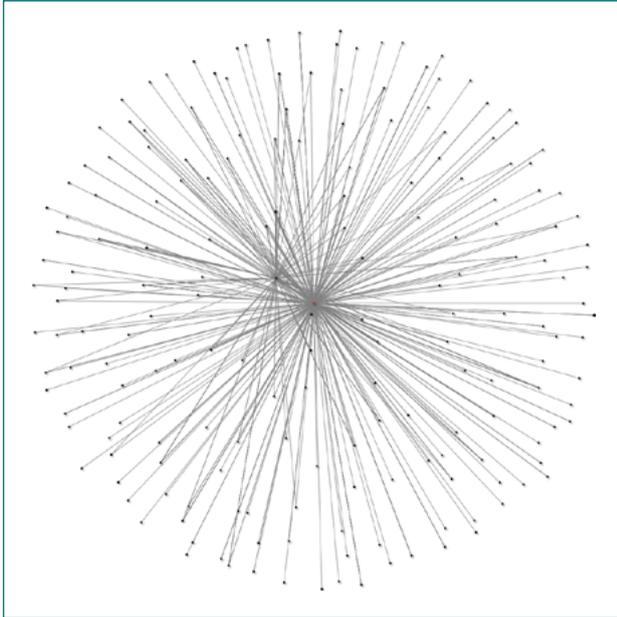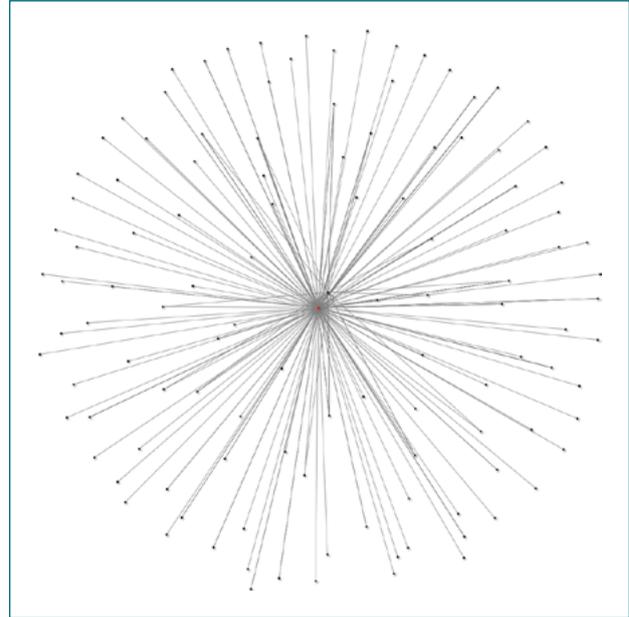
Marija Stojaković

Marija Stojaković
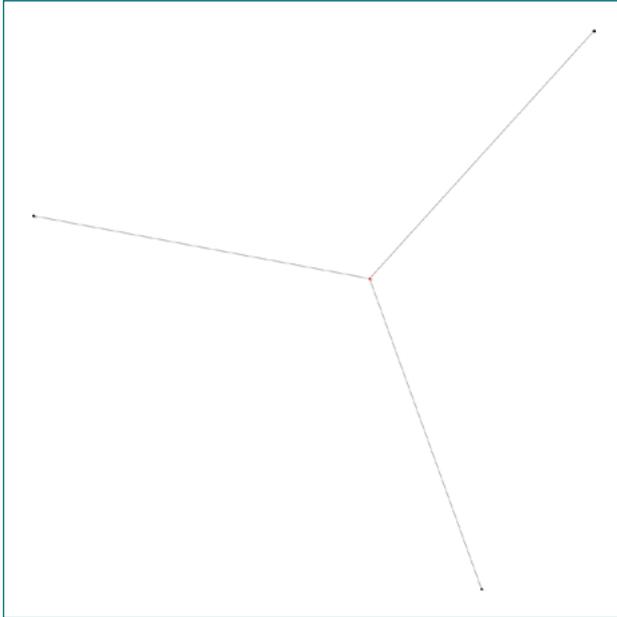
3rd wave
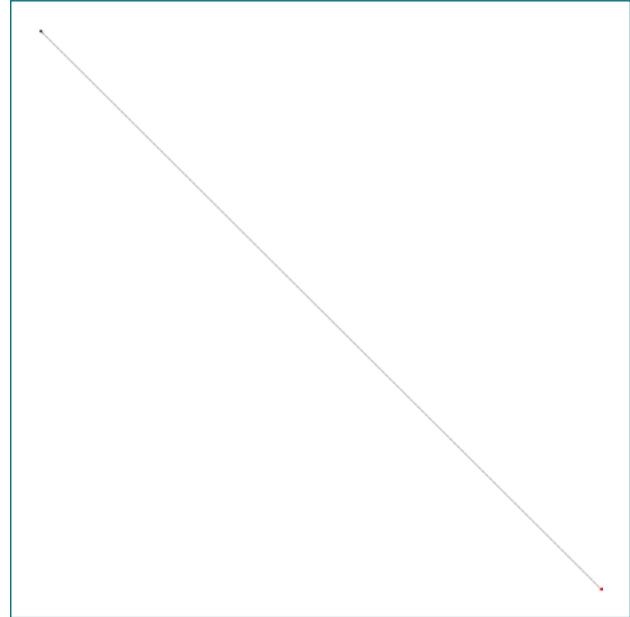
4th wave
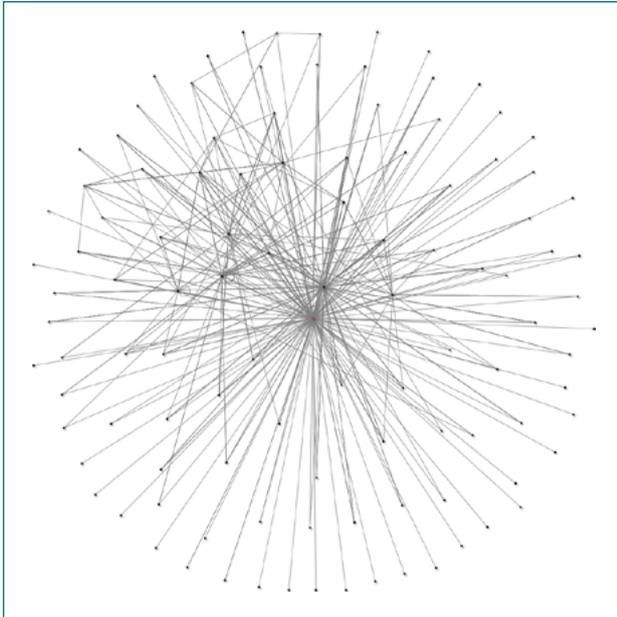
2012 Transformacija Svijesti

1st wave
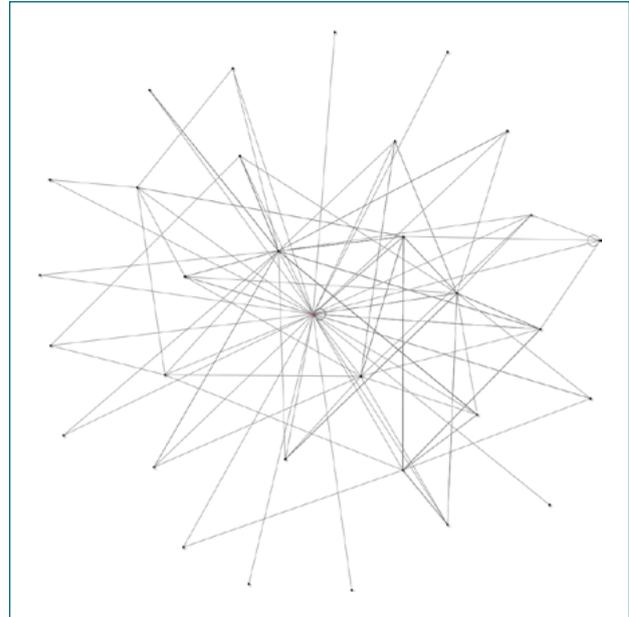
2nd wave

2012 Transformacija Svijesti

3rd wave
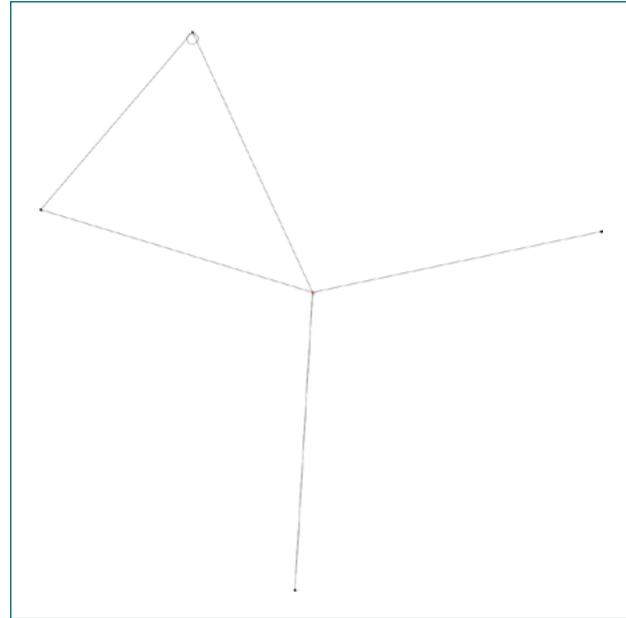
4th wave

logicno.com

1st wave

2nd wave

logicno.com
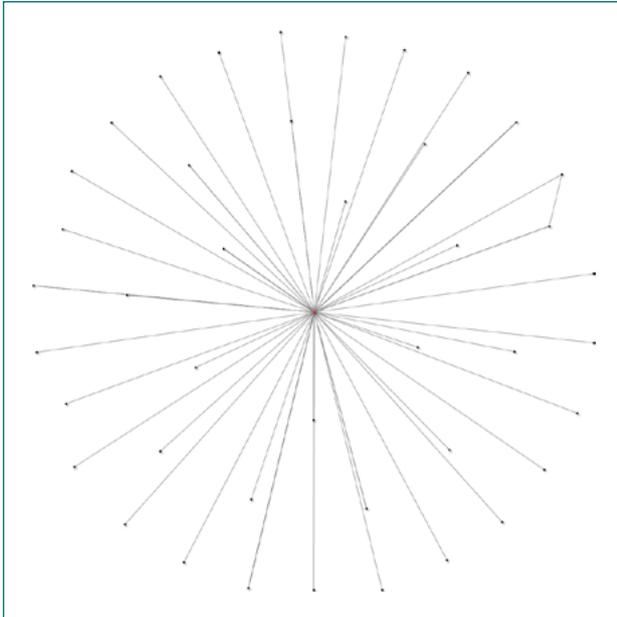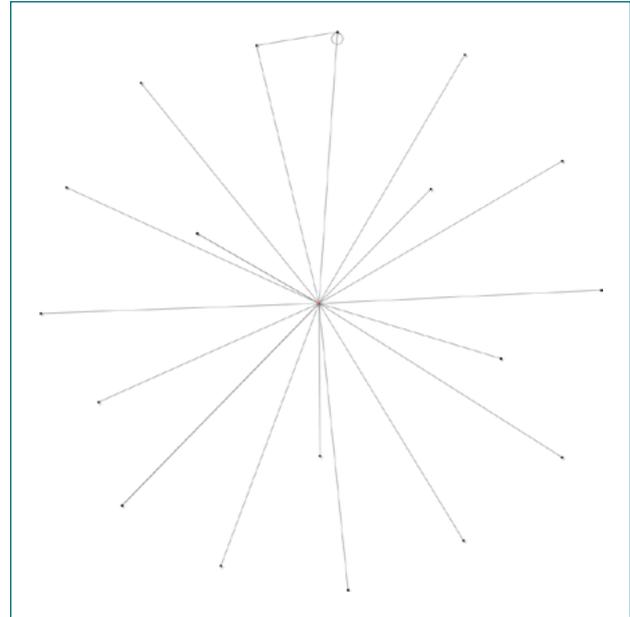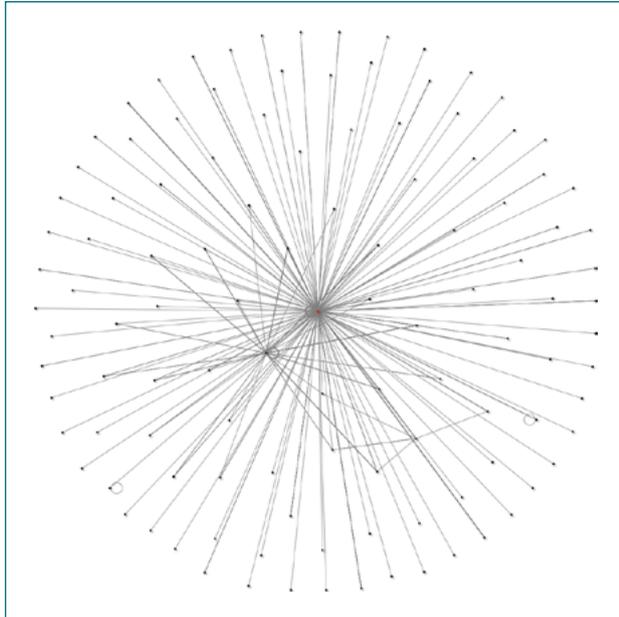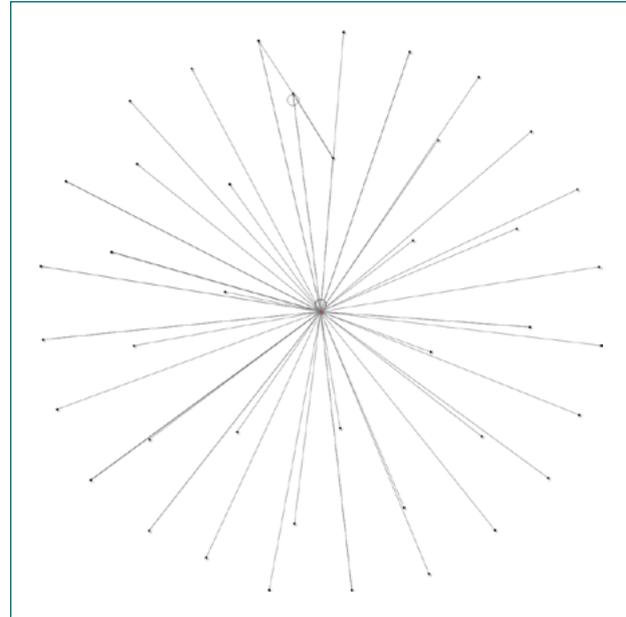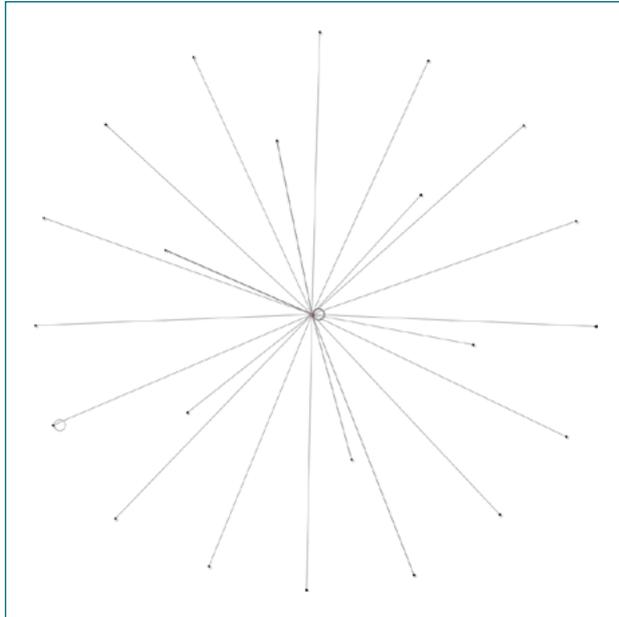
3rd wave

4th wave

1ˢᵗ wave

2ⁿᵈ wave

3rd wave

4th wave

Narodni Referendum

1st wave
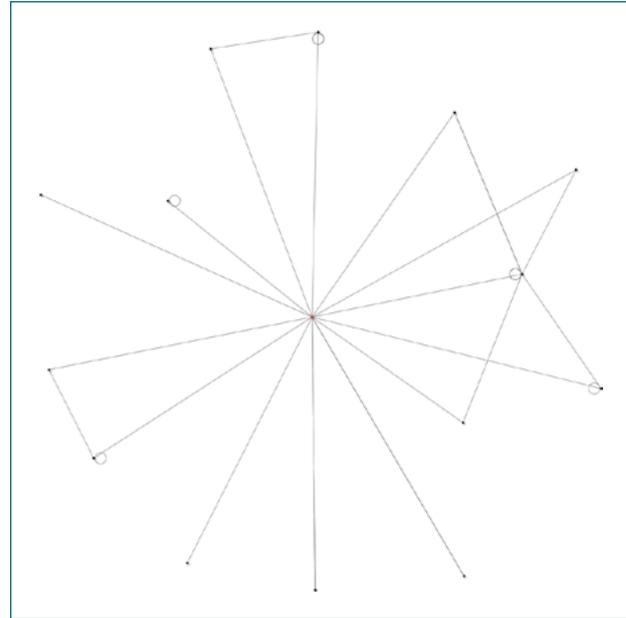
2nd wave

Narodni Referendum
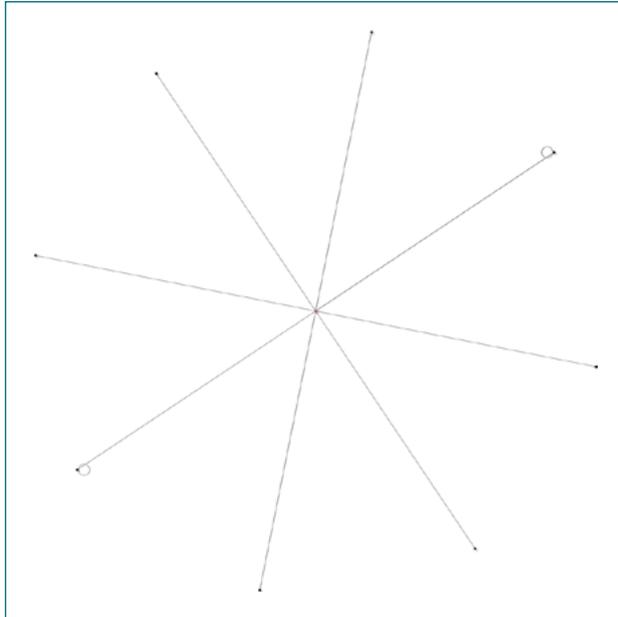
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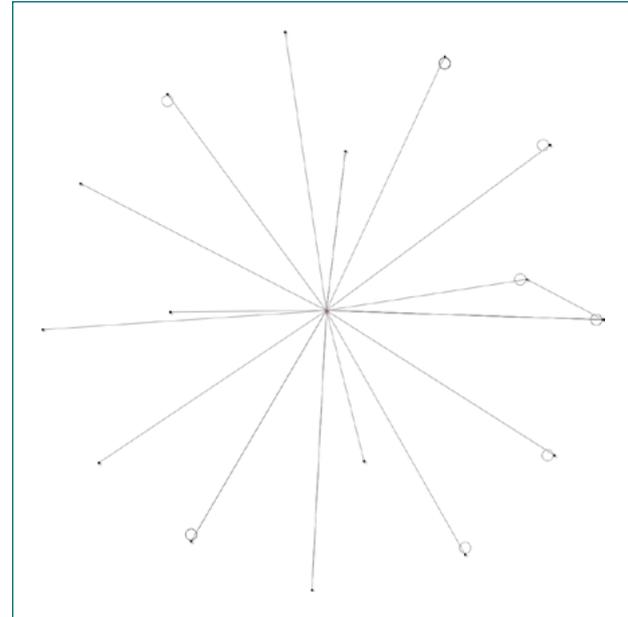
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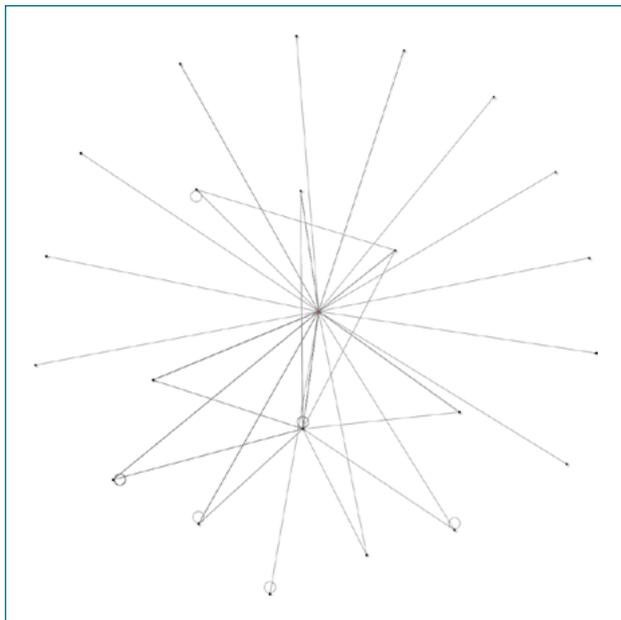
Saznajmo istinu o Koroni

1st wave
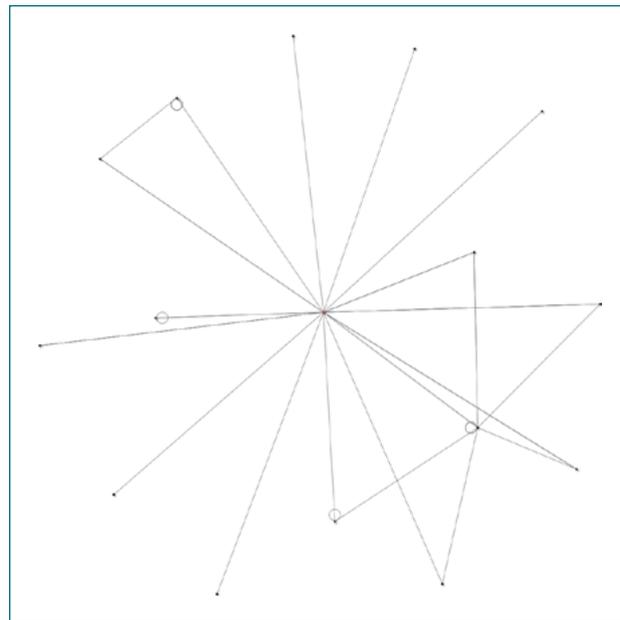
2nd wave

Saznajmo istinu o Koroni
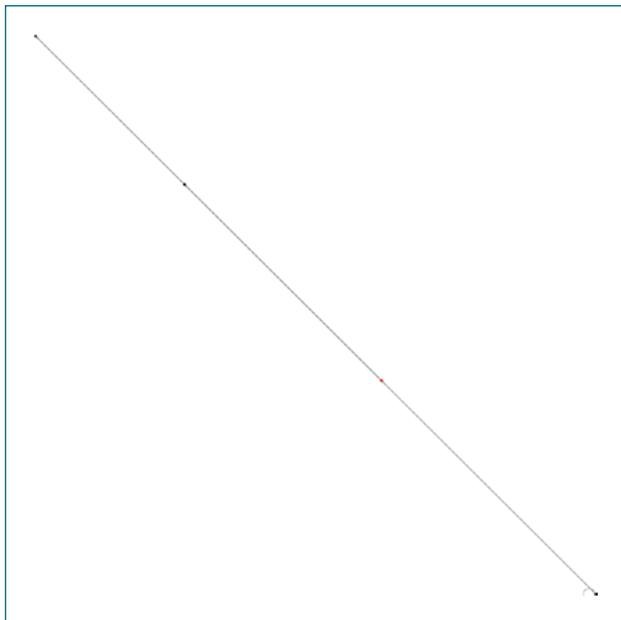
3rd wave
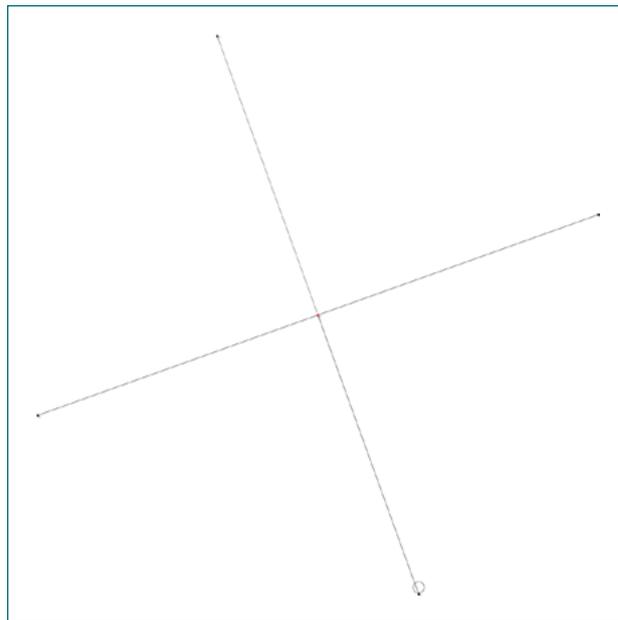
4th wave
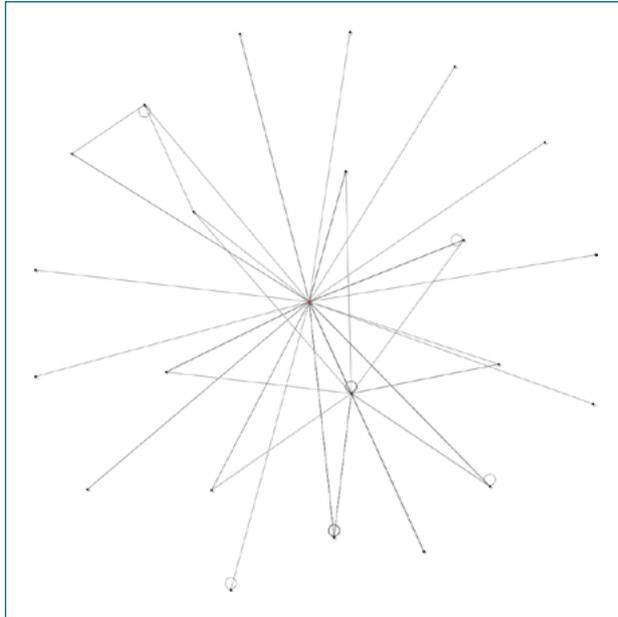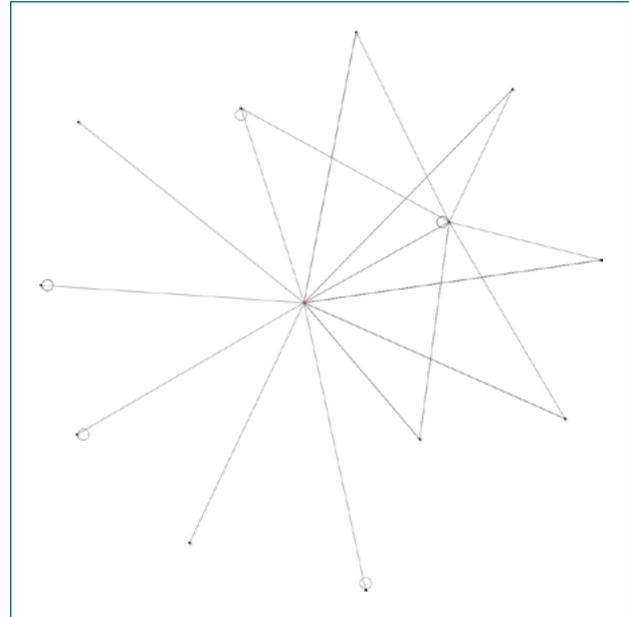
Glavna grupa stranke Ivana Pernara

Glavna grupa stranke Ivana Pernara

3rd wave
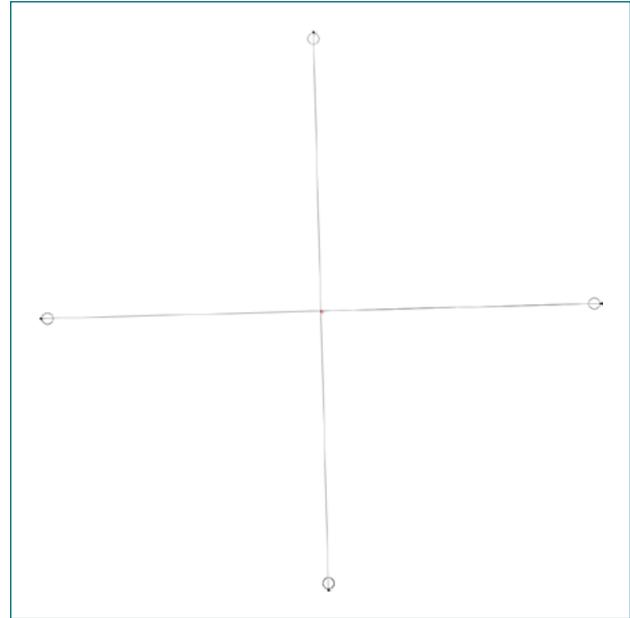
4th wave

Istina.info.nova

1st wave

2nd wave

Istina.info.nova
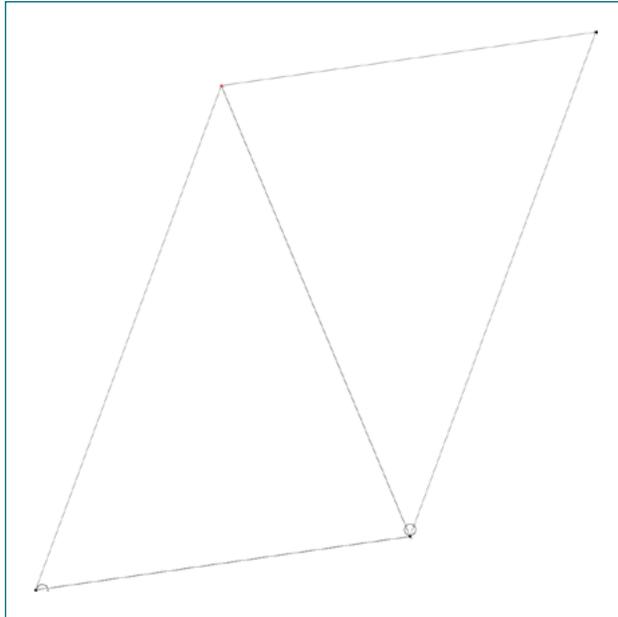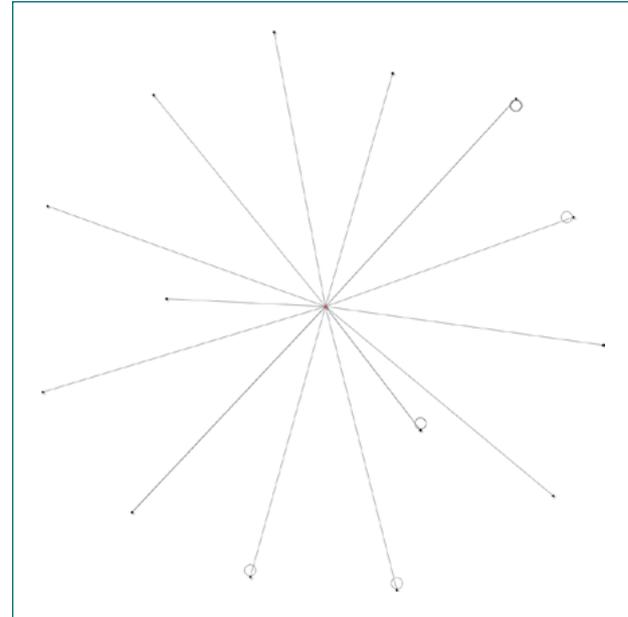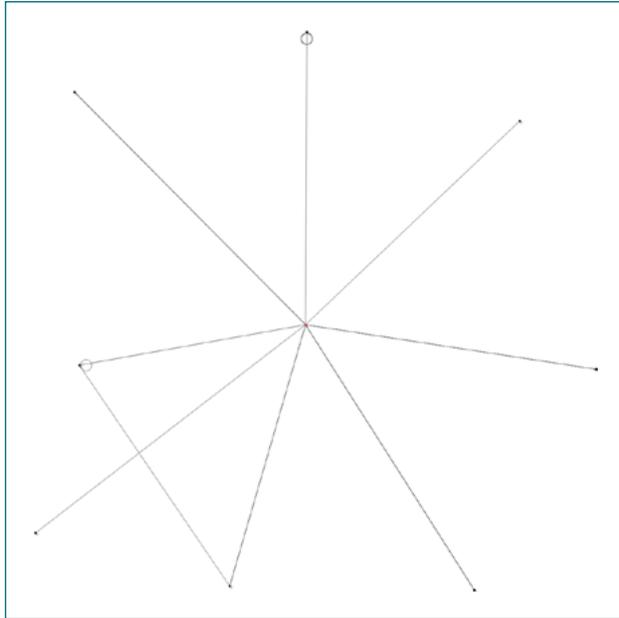
3rd wave
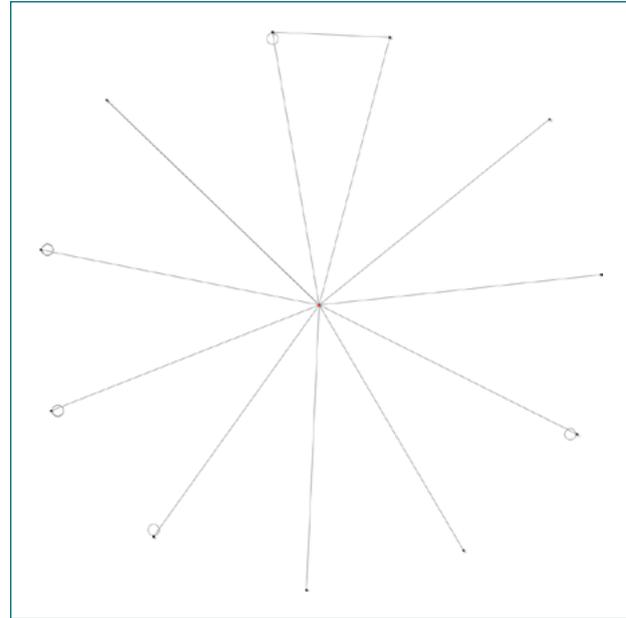
4th wave

CONCLUSION

Application of the dynamic network analysis showed that pioneer vertices on Covid-19 disinformation were later situated in the center of disinformation clusters and facilitated forming of the community clusters around them. Additionally, it showed that even a single actor can influence the structure of the disinformation ecosystem. Probably the most interesting finding from DNA confirmed that Covid-19 disinformation ecosystem has a superorganism characteristic that enables it to survive mitigation techniques through various strategies like e-establishment/re-structuration of vertex, late introduction of new vertex, and morphing. On the single vertex level, Covid 19 ecosystem's actors were very unstable but shoaling to find the best surviving technique.

The limitations of the study are coming from the use of a static visualization approach that can be naïve in analyzing complex temporal systems and "...fails to exhibit relationship changes over a time period" (Zaidi et al. 2014).

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4

Mapping fact-checking and fact-disseminating networks in Croatia

dr. MATO BRAUTOVIĆ

Department of Communication, University of Dubrovnik

INTRODUCTION

The problem of online disinformation may be solved through various strategies and approaches. For example, platforms such as Facebook, Google, and Twitter can adjust their algorithms to limit the spread of disinformation. Similarly, various independent organizations can work with the platforms to conduct campaigns to correct disinformation after it has been published, also known as fact-checking. There are also examples where national legislation has attempted to address the problem (France), or where many governmental and non-governmental organizations are attempting to do the same through media literacy campaigns. This report analyzes the effectiveness of fact-checking in curbing Covid-19 disinformation, by using interdisciplinary methods to identify local (Croatian) fact-checking and fact-disseminating sources related to Covid-19.

Fact-checking as a strategy to curb disinformation on the Internet has its limitations, as many actors on the Internet spread disinformation, while only a limited number of organizations, with limited resources, attempt to correct disinformation and prevent its spread. Regardless of this limitation, it should be noted that the fact-checking process should be carried out even if it does not have the reach and impact of (negative) disinformation, as it defends the culture of truth[34] and can improve mitigation efforts. There is only one Croatian-based fact-checking organization, Faktograf.hr, which was founded in 2015 as a project of the CSO Gong and the Croatian Journalists Association. As of 2021, it became an independent organization (Faktograf.hr, 2022). In a period of two years (January 2020-December 2021), Faktograf.hr published 540 fact checks on Covid-19, which dealt with numerous Covid-19 disinformation found on social media and news media (in the same cases, a single fact check dealt with several disinformation). These fact checks were the basis for Facebook to "silence" and even delete some of the disinforming content and sources (pages, profiles, groups), and they were quite successful in this process, as only 253 original disinformation items (47% of 540 fact checks) were still available on Facebook in December 2021 (Brautović, 2022a). In addition to the efforts of Faktograf.hr staff, their success can also be explained by their close cooperation with Facebook, as they are part of Facebook's Third-Party Fact Checking program, and a member of the SEE Check network, which consists of 6 fact-checking organizations from 5 countries in Southeastern Europe (Fake News Tragač, Raskrikavanje.rs, Raskrinkavanje.ba,

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34   Truth is the foundation of contemporary societies and democracy. Even in circuitmess, truthfulness has to be defended and promoted because it is an essence of human relationships.

Raskrinkavanje.me, and Razkrinkavanje.si). Collaboration with Facebook gave them access to tools such as CrowdTangle that help uncover disinformation, while collaboration with regional fact-checking organizations helps promote their work, conduct media literacy campaigns, share knowledge, and other synergistic efforts in the fight against disinformation (SeeCheck, 2022).

Based on previous research, we developed the following research questions:
- ▶ RQ1: Who were the actors that shared fact checks about Covid-19 created by Faktograf.hr (users, accounts, pages, and websites)?
- ▶ RQ2: Did Faktograf.hr create a community around the Covid-19 fact checks, and how did it reinforce the transcendence of disinformation?

METHODOLOGY

For this study, we used a mixture of methods to retrieve and analyze the collected data: automated text analysis, social network analysis, visual network analysis, and dynamic network analysis. These methods were used to study the networks of URL exchange, which allowed us to map "...communities of pages, groups, and profiles that promoted similar content" (Bruns et al., 2020, p. 15) and to examine the dynamic behavior of disinformation ecosystem actors, particularly over time (Zaidi et al. 2014). In terms of the network of URLs, the vertex (node) represents the page, group, or profile, while the edge (links) represents the relationships or interactions that connect them.

The dataset was adapted from the Covid-19 disinformation ecosystem study (Brautović, 2022a) and was based on CrowdTangle data on URLs found on Faktograf's blog about Covid-19 disinformation, from January 1st, 2020 to December 31st, 2021. The dataset had 5128 edges[35] (N=5128) and unique 1528 vertices[36] (N=1528).[37]

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35   Edge represents connection or relationship between two vertices. In our case it is sharing someone's link.

36   Vertex or node represents actors sharing Covid-19 (di)sinformation. In SNA it's visualized as a dot in the graph.

37   An analysis of the entire disinformation ecosystem about Covid-19 can be found in Brautovic (2022a), with this report only showing the results on the Faktograf.hr cluster.

We used NodeXl software for social network analysis and visual network analysis. The visualization was created using theHarel-Koren Fast Multiscale algorithm[38], clusters were colored with different colors and connections (shared URLs) were colored from orange to purple depending on the weight of the relationship (number of shared URLs). The size of the vertex was scaled based on the betweenness centrality measure (measure of the vertex's influence in spreading information on social networks), and only the most influential vertices were given labels. Since the same sources (organizations or individuals) usually have multiple sources, such as websites, Facebook pages, and similar web domains, we used the same names/labels to reduce them to the same source whenever possible. For example, Faktograf.hr had both a website and a Facebook page that were referred to as Faktograf.hr and used as a single cornerstone. In cases where it was difficult to determine the relationship between the pages, we left them as they were. For example, in the case of the Matrix Facebook page and the Matrix YouTube channel, it was impossible to establish the connection.

RESULTS

The Faktograf.hr cluster consisted of 124 vertices (actors) that had 880 edges (publicly shared links) during the two-year period, 539 of which were self-loops[39]. In addition to Faktograf.hr itself, links were shared by SEE Check network (N=109), Croatian journalist Denis Latin (N=39), and the Facebook group "Koronavirus Hrvatska - COVID19 - savjeti i informacije" (N=20) (Table 2). Although this group of actors represents fact-disseminating sources related to the pandemic COVID -19, the data show that disinformation sources were more numerous and influential in the Faktograf.hr cluster (Table 1).

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38   Algorithm used for visualization of SNA that forces closely connected vertices to be plotted near.

39   Number of the times that vertex shared its own link.

VERTEX NAME
1. Nora Zabava
2. Српско Народно Царство
3. TOMA LOVA
4. JEDI ZDRAVO DIREKTNO SA SELA
5. Relax Portal
6. Gordan Lauc
7. STOPPT Markus Söder (Offizielle Seite)
8. Unser Herbert Kickl (FPÖ)
9. SLAVIJA INFO
10. Roditelj odlučuje
11. Kaleidoskop
12. Liberal.hr
13. Roditelj odlučuje 3.0
14. САО СРБ
15. Srbija svaki dan
16. EKOLOZI SVIH ZEMALJA-UJEDINITE SE! Environmentalists of all countries unite
17. STOP 5G Srbija
18. Cijepljenje / Vakcinacija - grupa za sve koji imaju pitanja i nedoumice
19. ЗЛОЧИН НАД МОЈИМ НАРОДОМ СРБСКИМ (ГЕНОЦИД КОЈИ ТРАЈЕ)
20. Владимир Путин - мировой лидер
21. VAKCINE - zašto im kažemo NE?
22. ZAPREŠIĆ BEZ CENZURE
23. КОСОВСКИ ФРОНТ СРБИЈЕ
24. ZORAN MILANOVIĆ FANKLUB - I MOJ PREDSJEDNIK!
25. ZDRAV RAZUM I JAVNA KRITIKA
26. Pravo na izbor
27. Gde je sad moj Beograd?
28. HRVATSKA STRANKA PRAVA - HSP
29. МАКЕДОНИЈА - МАКЕДОНСКО - МАКЕДОНЦИ
30. UJEDINJENI HRVATSKI DOMOLJUBI
31. Liberal.hr - grupa za rasprave
32. Velimir Bujanec
33. Gradjansko Budjenje
34. STOP NEPRAVDI
35. Život na selu moj vrt
36. Romano Live
37. HRVATSKA U SRCU
38. Poreština.info - novosti iz Poreča i okolice
39. Jutarnji
40. Novi svjetski poredak

Table 1: Verticies that were members of Faktograf.hr cluster ranked based on influence in the whole Covid-19 disinformation ecosystem

For example, disinformation sources such as Nora Zabava[40], Srpsko narodno Carstvo[41], Toma Lova[42], and others regularly shared Faktograf.hr's work. Many of the disinformation sources that shared content from Faktograf.hr were from Serbia, but also from Macedonia, Austria, and Germany, so this (part of the) network also had supranational characteristics (Brautovic, 2022a). However, the highest number of shares by disinformation actors came from Croatian sources such as Libertarijanci koji govore naški (N=11), FORUM (N=7), Glavna grupa stranke Ivana Pernara (N=6), Koronavirus (COVID -19) Hrvatska: zabrinuti (N=6) and Saznajmo istinu o Koroni (N=6) (Table 2)

VRHOVI	BROJ DIJELJENJA
SEE check	109
Denis Latin	39
Koronavirus Hrvatska - COVID19 - savjeti i informacije	20
Libertarijanci koji govore naški	11
FORUM	7
Glavna grupa stranke Ivana Pernara	6
Koronavirus (COVID-19) Hrvatska: zabrinuti	6
Saznajmo istinu o Koroni	6
Gordan Lauc	5
Borba Protiv Okupacije	5

Tablica 2: Top 10 vrhova koji su dijelili rezultate provjera činjenica s Faktograf.hr-a

It should be noted that in many cases sharing fact checks was a form of criticism of Faktograf.hr. Figure 1 shows an example where alternative media 2012 Transformacija Svijesti shared Faktograf.hr's fact check about 5G technology and its impact on human health, accusing them of spreading lies and half-truths and directly violating human rights mandated by UN (2021 Transformacija Svijesti, 2020).

40   Facebook public group founded by Vutra.si Sloevenian webshop for selling cannabis.

41   Facebook public page founded by political organization Serbian People's Front.

42   Facebook page founded by Serbian alternative media Code17.
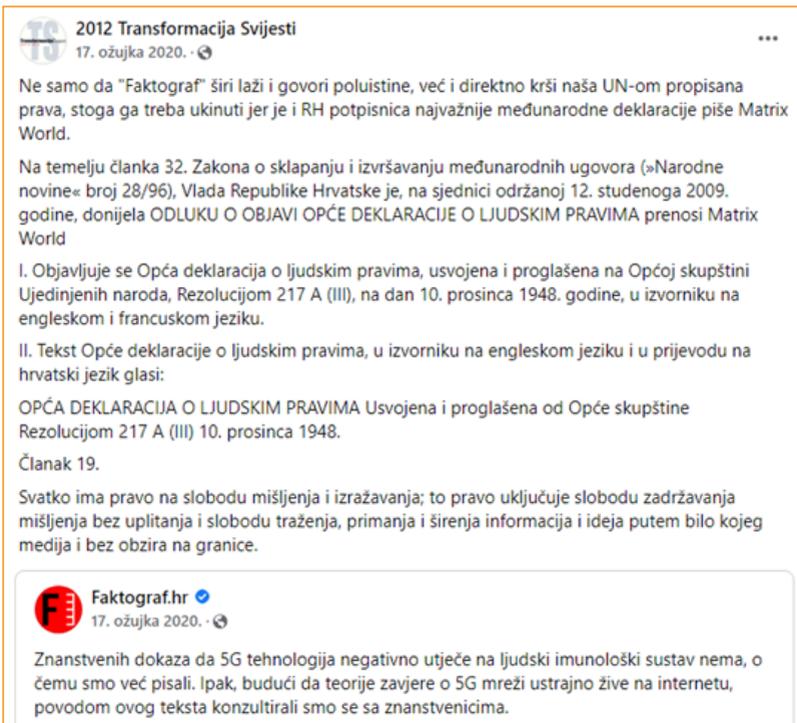
Figure 1: Example of criticism of Faktograf.hr
Source: https://www.facebook.com/337296072954727/posts/3837252699625696

A detailed analysis of the 5 most frequently shared fact-checks revealed that public actors make up only a small part of the overall network (Table 3). Unfortunately, it was not possible to explore this finding further because Crowd Tangle does not provide access to private data.

Title	URL	Facebook Shares	Shared by (only public sources)
Da, Talijani umiru više nego inače	https://faktograf.hr/2020/04/03/da-talijani-umiru-vise-nego-inace/	367	Sladoljev Srećko Bruna Zlatko i Željko - NEOVISNI ZA HRVATSKU DOMOLJUBI SU ZA DOMOVINSKI POKRET Koronacija Denis Latin
Veza između korona virusa i 5G se ne zataškava, jer je nema	https://faktograf.hr/2020/03/16/korona-virus-5g-ivijesti/	267	AWAP Divlje Životinje 2012 Transformacija Svijesti prof.dr. DAVOR PAVUNA - okupimo čestite ljude za novu Hrvatsku Републиканска Македонска Народна Партија(оригинален профил) Владимир Путин - Мировой Лидер МАКЕДОНИЈА. МАКЕДОНИЈА - МАКЕДОНСКО - МАКЕДОНЦИ
Viralni dezinformirajući video američkih liječnika stigao je i u Hrvatsku, rapidno se širi	https://faktograf.hr/2020/07/31/viralni-dezinformirajuci-video-americkih-lijecnika-stigao-je-i-u-hrvatsku-rapidno-se-siri/	183	Koronavirus Hrvatska - COVID19 - savjeti i informacije Podrska "DOSTA JE BILO" do konacne pobede Libertarijanci koji govore naški COVID-19 RS INFO
Širi se video u kojem Mislav Kolakušić netočno i manipulativno govori o pandemiji	https://faktograf.hr/2021/06/14/mislav-kolakusic-netocno-i-manipulativno-govori-o-pandemiji/	172	Grupa podrške sucu Mislavu Kolakušiću Vaccine Freedom of Choice Chemtrails report Serbia TOMA LOVA ZORAN MILANOVIĆ FANKLUB - I MOJ PREDSJEDNIK! JEDI ZDRAVO DIREKTNO SA SELA
Netočno je da su se "testovi za COVID-19" prodavali već prije dvije godine	https://faktograf.hr/2020/09/07/testovi-za-covid-19-svjetska-banka-wits/	156	Hrvati u Austrijiâ-Gruppe Saznajmo istinu o Koroni Glavna grupa stranke Ivana Pernara FORUM STOP NEPRAVDI

Table 3: Top 5 the most shared fact-checks

The Faktograf.hr cluster had a broadcast structure with a distinct hub (Faktograf.hr) at the center, where many actors repeated (shared) what they posted. In the case of the broadcast structure, the majority of actors were connected only to the hub, although in some cases there were small interconnected subgroups, as in the case of the alternative media portal Relax and Slavija Info. This finding confirms that Faktograf.hr was a powerful agenda setter and conversation starter (Smith et al, 2014).
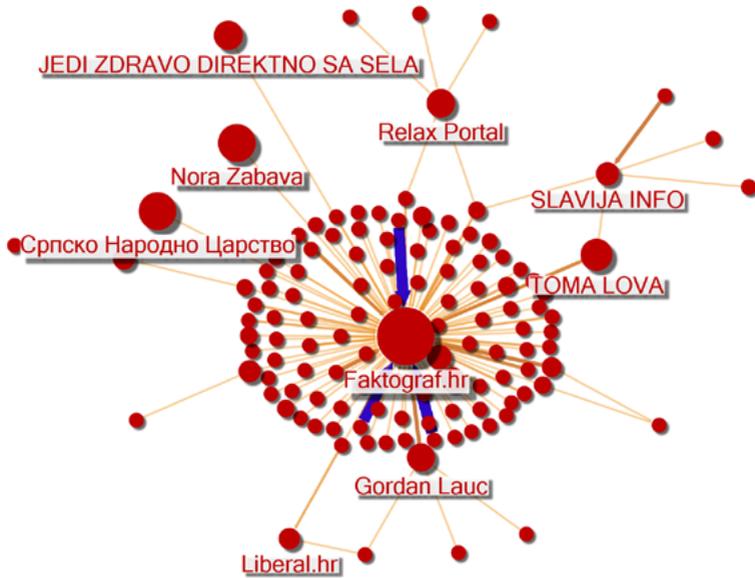
Figure 2: Faktograf.hr cluster aggregated based on sharing data*
The size of the vertex proportional in whole Covid-19 disinformation ecosystem

Figure 3 shows that the Faktograf.hr cluster maintained its broadcast structure during the four waves of the pandemic. The SEE Check network and the Facebook group "Koronavirus Hrvatska - COVID19 - savjeti i informacije" were active throughout the analyzed period, while Denis Latin actively disseminated fact-checks during the first two pandemic waves. On the other hand, disinformation actors showed different survival strategies, confirming the finding that the disinformation ecosystem functioned as a superorganism (Brautovic, 2022b).

Figure 3: Development of the fact-checking cluster

Figure 3: Development of the fact-checking cluster
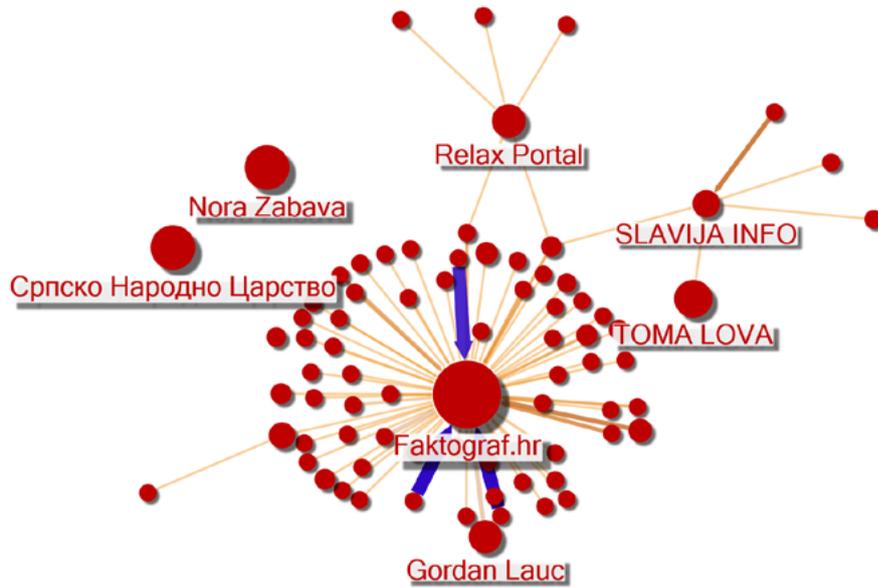
Figure 3: Development of the fact-checking cluster

JEDI ZDRAVO DIREKTNO SA SELA
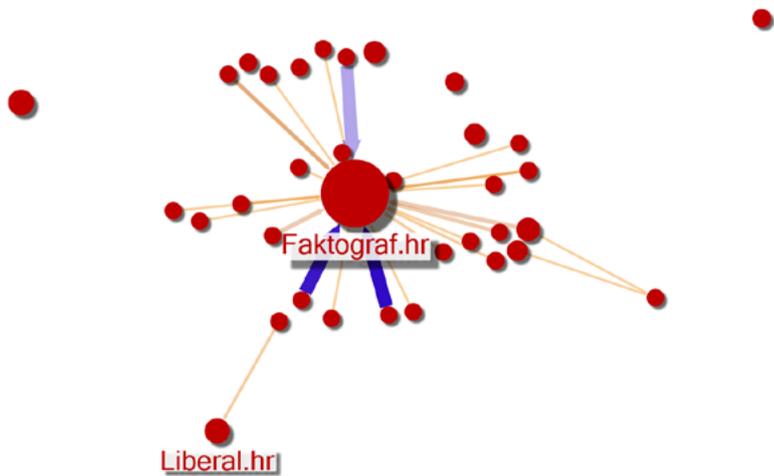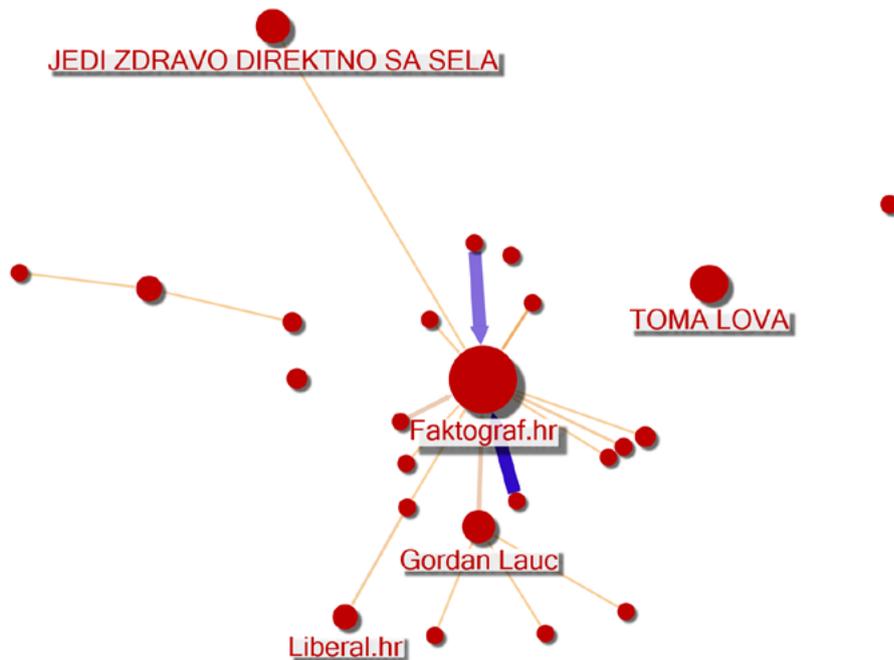
Nora Zabava

Српско Народно Царство

TOMA LOVA

Faktograf.hr

Gordan Lauc

Liberal.hr
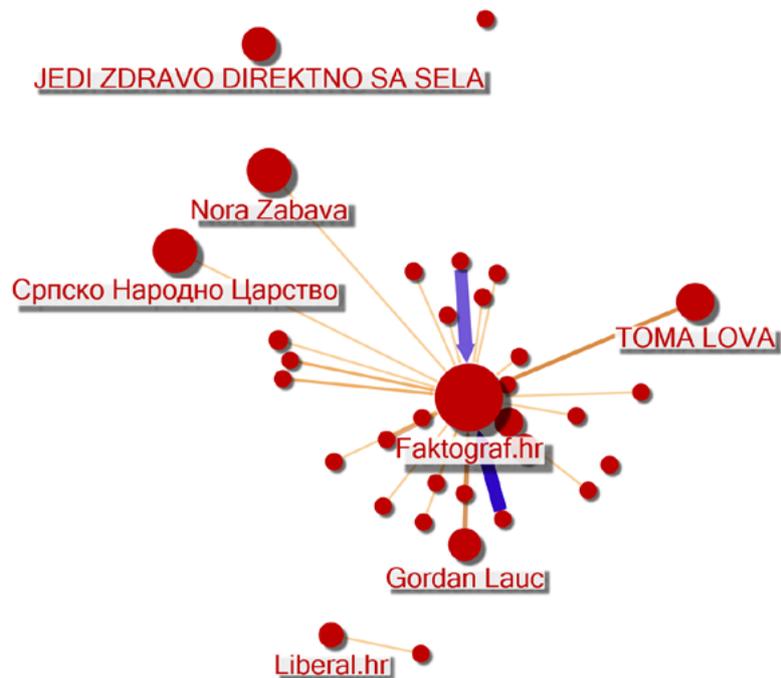
Figure 3: Development of the fact-checking cluster

CONCLUSION

The findings presented in this report confirm that fact-checking as an approach to combating disinformation on the Internet has some limitations. However, debunking disinformation is important because it defends the culture of truth and can improve efforts to curb disinformation. The case of Faktograf.hr confirms this, as Faktograf.hr was able to prevent 54% of disinformation, but the majority of actors share Faktograf.hr fact checks as a form of criticism rather than an attempt to reduce the spread of disinformation.

To be more effective in their work, fact-checking organizations need to collaborate more with other fact-checking organizations that cover the same disinformation ecosystem and mainstream media. In the case of fact-checking organizations, they should make more efforts to build a close community of people and organizations dedicated to sharing correct information. In the second case, mainstream media need to take more social responsibility and support fact-checking organizations in disseminating fact-checks, as they have a much larger audience. The partnership between mainstream media and fact-checking organizations should be one of the political priorities at EU and national level.

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5

Content Analysis of COVID-19 Related Disinformation on Facebook: Topics, Sources and Discourses

dr. MARIJANA GRBEŠA ZENZEROVIĆ
Faculty of Political Science, University of Zagreb

dr. MILICA VUČKOVIĆ
Faculty of Political Science, University of Zagreb

PUBLIC TRUST, COVID-19 AND DISINFORMATION IN CROATIA

 In January 2020, the World Health Organization (WHO) declared a Public Health Emergency of International Concern (PHEIC) following the outbreak of the coronavirus (COVID-19). The world has found itself in an unprecedented crisis. The first case of the coronavirus infection in Croatia was registered in February 2020. Rapid reaction of Croatian institutions and the favourable media coverage of the people in charge of managing the crisis, gathered in The Civil Protection Headquarters of the Republic of Croatia, led to a surprising jump in public trust in the early days of the pandemic. This came as a surprise given that the trust in institutions in Croatia is generally amongst the lowest in the EU (Henjak, 2017). According to the Eurobarometer (winter 2021-2022), only 21% of respondents in Croatia tend to trust the Government while 22% tend to trust the Parliament. In comparison, the average trust in national governments and parliaments in the EU is 35% and 36% respectively.

In February 2020, just before the outbreak of the COVID-19 pandemic, 70% respondents included in a regular monthly IPSOS survey believed that Croatia was heading in the wrong direction.[43] However, the handling of the pandemic in Croatia throughout February, March and April 2020 was generally perceived as "timely, adequate, and successful, while the actions of the Headquarters were hardly challenged or disputed" (Grbeša, 2020: 63). In April 2020, IPSOS registered a surprising surge in public optimism: 51% of respondents thought the country was going in the right direction.[44] According to Grbeša (2020) this was likely due to a confidence the citizens felt about how the crisis was being handled. In the same month, Minister of Health, Vili Beroš emerged as the most popular politician in the country for 29.2% of respondents compared to only 2% in March 2020, which is the biggest surge in personal rating in the history of CRO Demoscop, a regular political monthly survey.[45]

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43   Dnevnik.hr (25 March 2020), Imaju li Vlada i predsjednik podršku građana u borbi protiv koronavirusa. https://dnevnik. hr/vijesti/koronavirus/crobarometar-imaju-li-vlada-i-predsjednik-podrsku-gradjana-u-borbi-protiv-koronavirusa---599087. html.

44   Dnevnik.hr (24 April 2020), HDZ povećao prednost pred SDP-om, popularnost raste i Plenkoviću i Milanoviću. https://dnevnik.hr/vijesti/hrvatska/crobarometar-popularnost-stranaka-i-politicara-u-vrijeme-korona-krize---602923.html.

45   Maretić Žonja, Petra (5 April 2020) Nakon tri mjeseca HDZ ponovno prvi izbor građana, a Beroš najpozitivniji političar. *Večernji list*. https://www.vecernji.hr/vijesti/ neocekivana-promjena-u-jeku-krize-politicari-ce-morati-opravdati-velika-ocekivanja-1392018.

However, as soon as it was perceived that decisions of the Headquarters may be driven by politics rather than expert judgments, the public image of the key communicators started to deteriorate. The public mood shifted back to pessimism, with 61% of respondents thinking that the country was going in the wrong direction in May 2020 and 70% in June 2020.[46] Personal rating of the Minister Vili Beroš also sharply declined – he emerged as the most positive politician for 15.4% of respondents in May and 8.1% in June 2020.[47]

It is plausible to assume that the context of institutional distrust has led certain groups of citizens to be distrustful about the dominant, official narrative and policies related to the COVID-19 pandemic, especially during the later stages of the pandemic. This opens the way for the spread of disinformation, misinformation and "alternative" narratives. Several data and studies strongly support this assumption.

First, the vaccination rate in Croatia is among the lowest in the European Union. In August 2022, according to the official data, 68.83% of the population was fully vaccinated. In comparison, in Ireland, France, Denmark or Germany, this number exceeds 90%. According to the Eurobarometer survey from winter 2021-2022, 17% of respondents from Croatia said that they never want to get vaccinated against COVID-19, which is one of the highest percentages in the EU. The European Union average is only 8%.

Second, trust in healthcare workers in Croatia has decreased during the pandemic. According to Eurobarometer surveys from spring 2021 and winter 2021-2022, 66% of Croatian respondents trust health professionals, while 32% do not trust them, which is a drop of several percent compared to earlier measurements. Average trust in healthcare workers at the level of the entire EU is around 80%.

Third, some research suggests that a certain percentage of citizens in Croatia is prone to conspiratorial thinking (see for instance Tonković et al., 2021). For example, the Special Eurobarometer 516: European Citizens' Knowledge and Attitudes about Science and Technology from September 2021 suggests that 50% of Croatian citizens believe that viruses are produced in government laboratories in order to control our freedom (see Chart 1)

46   Dnevnik.hr (25 May 2020): Crobarometar otkriva odnos snaga mjesec dana prije izbora. HDZ ispred Restart koalicije, Škoro treći. https://dnevnik.hr/vijesti/parlamentarni-izbori-2020/crobarometar-za-svibanj-hdz-na-vrhu-ali-im-je-restart-za-petama-606754.html. Dnevnik.hr (26 June 2020) Hrvatska u završnici izbora. https://dnevnik.hr/vijesti/parlamentarni-izbori-2020/hrvatska-u-zavrsnici-izbora-hdz-birajustariji-muskarci-a-restart-koaliciji-sklonije-zene---610790.html.

47   Gregoret, Damira (7 June 2020), Novi CRO Demoskop: Preokret na vrhu, Restart u prednosti pred HDZ-om! Milanović najnegativniji. *RTL*. https://www.rtl.hr/vijesti-hr/novosti/hrvatska/parlamentarni-izbori-2020/3829890/najnoviji-cro-demoskop-preokret-na-vrhu-restart-koalicija-u-prednosti-nad-hdz-om-milanovic-najnegativniji

QA20.11 Finally, for each of the following statements, please indicate whether you believe them to be true or false. If you don't know, you can just indicate so.
Viruses have been produced in government laboratories to control our freedom (%)
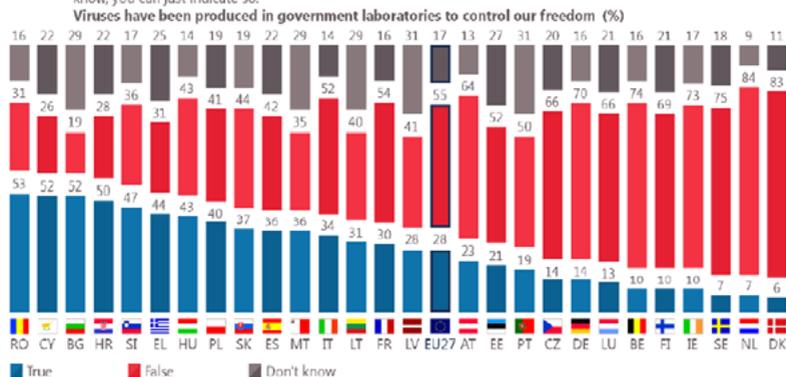
Chart 1: Agreement with the claim that viruses have been produced in government laboratories. Source: Special Eurobarometer 516, September 2021

Fourth, trust in mainstream media in Croatia is among the lowest in the European Union. According to Eurobarometer (spring 2021), only 28% of Croatian respondents said that they trusted the media, compared to 41% at the level of the entire European Union. Although Croatian citizens trust traditional media (television, radio and print) more than they trust social networks, trust in traditional media in Croatia is below the EU average while trust in social networks is above the EU average (see Table 1).

%	2019		2021 - 2022	
	Croatia	EU	Croatia	EU
Radio	50	57	46	56
Television	47	49	43	49
Print	39	46	36	49
Social networks	32	20	27	20

Table 1: Trust in media. Source: Standard Eurobarometer 92, autumn 2019 / Standard Eurobarometer 96, winter 2021-2022)

Finally, in 2019 73% of Eurobarometer's respondents from Croatia believed that they often encounter 'news' that distort or falsely portray reality. In winter 2021-2022 (Eurobarometer 96, 2021-2022) this percentage was 80%.

Distrust in official sources of information and traditional institutions expressed by Croatian citizens during COVID-19 pandemics, coupled with the impression that disinformation is vastly present in Croatian public spaces, suggests that Croatia needs to invest serious resource into building institutional trust and strengthening resilience against disinformation.

GOAL AND RESEARCH DESIGN

The main goal of this study was to analyse the content of the COVID-19 related disinformation on Facebook in Croatia. Specifically, the goal was to establish how disinformation is constructed and what are its main components and points of appeal. We used qualitative and quantitative content analysis to identify prevailing topics, agents and sources of disinformation and to examine narratives, propaganda techniques and discourses in the posts retrieved from the pages that were immersed in the disinformation universe. We also conducted basic content analysis of the Facebook pages entangled in the disinformation universe to gain the idea about the profile and the logic of the pages that engage with COVID-19 related disinformation debunked by the Croatian fact-checker Faktograf[48].

Content analysis of the Facebook pages

Using SNA (Social Network Analysis) and VNA (Visual Network Analysis), we captured 1528 sources that engaged with the content debunked by a Croatian fact-checking organization Faktograf (see Brautović, 2022).[49] We eliminated 625 Facebook pages that were in languages other than those spoken in the former Yugoslav countries (i.e., pages that were in English, Romanian, Bulgarian, Russian, Ukrainian, or similar). We also excluded 82 internet sources that were not Facebook pages, such as news sites, fact-checking sites,

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48   Faktograf.hr is the only Croatian media outlet specialized in fact checking. Faktograf is a member of the International Fact Checking Network (IFCN), an international network of organizations dedicated to fact checking. Faktograf was launched in 2015 as a joint project of the Croatian Journalists' Association and an NGO organization GONG. In 2018, GONG became an independent publisher of Faktograf. In November 2021, Faktograf became an independent organization. Since April 2019, Faktograf it has been part of Facebook's Third Party Fact Checking program.

49   According to Oliveira and Gama (2012: 99) "a social network is constructed from relational data and can be defined as a set of social entities, such as people, groups, and organizations, with some pattern of relationships or interactions between them. These networks are usually modelled by graphs, where vertices represent the social entities and edges represent the ties established between them. The underlying structure of such networks is the object of study of SNA". In brief, SNA methods and techniques are aimed at discovering "patterns of interaction between social actors in social networks" whereas "the focus of SNA is on the relationships established between social entities rather in the social entities themselves" (Oliveira & Gama, 2012: 99). On the other hand, as Decuypere (2020: 74) suggests Visual Network Analysis (VNA) "is concerned with the *visual* rather than the *structural* (social) properties of networks and offers a conceptual toolkit to analyze and interpret these visual properties (and more particularly the concrete form of specific networks) in a qualitative manner".

institutional web sites or similar, and 44 sources that were not available anymore (e.g., the pages were shut down). The research corpus generated by SNA thus included 779 Facebook pages mainly in Croatian, Serbian, Slovenian, Montenegrin, Macedonian and Bosnian language. These pages were then classified according to two criteria: 1) 'the super-spreaders' – pages/groups/profiles that shared others' content the most, and 2) 'the most influential' – the pages/groups/profiles whose content was shared the most. According to Brautović (2022) the 'influencers' are mainly devoted to creating content while the super-spreaders are devoted to sharing links of alternative media, mainstream media and individuals. The super-spreaders' communication is mainly one-directional and primarily aimed at reinforcing certain narratives and discourses.

Coding sheet consisted of 10 categories. The pages were first coded for the type of the page (profile, public or private group, community, or business page). SNA and VNA analyses have already established that pages entangled in the disinformation universe that affects Croatian digital and consequently, public space have different geographical origin (Brautović, 2022). Therefore, we coded the pages for their country of origin. We then attempted to profile the page more closely by examining its purpose, i.e., if it is a fan page established to support a person (e.g., a politician, a doctor or similar), a page 'specialized' for COVID-19, or some other topic, a political page, satirical page, 'news' page, activists' page or a page dedicated to 'transcendental and/or religious' topics. Although certain categories may overlap, such as 'political' and 'activist' page, a pilot analysis indicated that there is a difference between the pages that are mainly devoted to politics (e.g., Vučić te laže ne veruj šta ti kaže / Vučić is lying don't believe what he is saying) and the pages that go beyond political issues (e.g., Borba Protiv Okupacije / Fight against occupation).

The pages were then coded for the presence of common conspiracy theses, such as anti-vaccine topics in general, digital control, conspiracy theories about migrants, glorification of Vladimir Putin and his crusade against the West, strong anti-American sentiment etc. Finally, we investigated the presence of certain discourses. We coded pages for presence of the populist sentiment (indicated by promotion of conflict between the people and elites and possibly, by presence of the "dangerous others", such as migrants, European Union etc.), presence of national(ist) cues and religious cues. The unit of analysis was one Facebook page. The agreement between two coders ranged from Cohen's kappa = .65 to 1. The complete Codebook is available in the Appendix A.

Facebook posts

The content analysis of Facebook posts was conducted on three sets of data. The initial data set included disinformation that were debunked by the Croatian fact-checker Faktograf. It contained 276 Facebook posts pertaining to COVID-19. The other two sets were created from a research corpus generated by SNA that included 779 Facebook pages. These pages were then classified according to two criteria: 1) 'the super-spreaders' – pages that shared content the most intensively and 2) 'the most influential' – the pages that produced content that was shared the most. From each of these two sets we automatically generated 300 posts with the biggest engagement, measured by the number of *shares*. Our decision to use *share* as a measure of engagement is based on a notion that *sharing* involves different types of behaviour and a greater level of engagement than *liking* and *commenting*. All three actions - *share, like and comment* - belong to quantitative metrics which is the most common in studies about social media engagement and its impact (Trunfio & Rossi, 2020). However, Kim and Yang (2017) argue that "strategic implication" of *like, comment* and *share* is not the same and that each behaviour assumes a different level and type of effort and involvement. They reason that "like requires less commitment" than *comment* and *share* which both involve "extra commitment or cognitive effort" (2017: 2). Yet, *share* has a higher level of commitment than *comment* because "when sharing a post, the post not only appears on News Feed but also goes to the user's profile page, suggesting that the shared post constitutes a part of user's self-presentation"(2017: 2). Hence, Kim and Yang (2017: 3) categorize "share as the highest, comment as the intermediate, and like as the lowest level" of engagement.

Initially we were able to automatically retrieve only textual part of the post, which represented a significant limitation since large number of posts contained photos, videos, and links. To resolve the issue, we automatically retrieved screenshots of all posts in both sets with a tool specifically developed for the purpose of this research. This tool captured entire posts, including photos, link previews, and still video previews. Facebook posts were automatically retrieved with links to posts using Python programming language.

We eliminated the posts that were unrelated to COVID-19, narrowing the sample down to 200 posts from 'the super-spreaders' set and 135 from 'the most influential' set. All posts included in the sample were published from 01/01/2021 to 09/03/2022.

The coding sheet consisted of 37 categories that were designed to examine: 1) structural features of the Facebook page which published the post (origin, type and profile of the page); 2) if the post was flagged as false by Facebook; 3) a period in which the post was published (first, second,

third, fourth or fifth wave of the pandemic); 4) composition of the post (i.e., presence of text, video, link, photo, meme or illustration in the post); 5) predominant topic of the post; 6) presence of different topics in the post; 7) sources and authorities mentioned in the post; 8) criticism of mainstream institutions and pandemic policies (e.g., scientists, government, mainstream media); 9) presence of certain discourse (nationalist, populist and religious discourse) and 10) presence of selected propaganda techniques (bandwagon, euphemism, fear, name calling) and calls to action. Propaganda techniques were selected based on the pilot analysis. Two of them – name-calling and bandwagon – are traditional propaganda devices, identified by the Institute for Propaganda Analysis back in 1937 (Sproule, 2001). Name calling, according to IPA happens when "the propagandist conjures hate or fear by attaching unattractive labels 'to those individuals, groups, nations, races, policies, practices, beliefs and ideals which he would have us condemn and reject' (Sproule, 2001: 136). Propagandist who deploys bandwagon "works to have people 'follow the crowd', to accept an idea or plan because 'everybody is doing it'" (Sproule, 2001: 136). Prato (2019: 10) explains euphemism as "figure of speech in which an appropriate expression is replaced with words or phrases that have a weaker meaning, so as to soften or conceal its excessive violence or crudeness for the sake of social expediency, or for religious, moral or even political concerns". He argues that this may lead "people to believe in the representation of reality developed by the orator, even when it is not based on verisimilitude", which is why "description of reality is often misleading and untruthful" (10). Finally, fear is a common propaganda tool that permeates much of contemporary political, public and corporate communication.

The unit of analysis was a Facebook post. Contents linked to the post (e.g., news articles, videos etc.) were coded only if the contents of the post itself were insufficient to determine the meaning of the post. The agreement between two coders was strong across all categories. It ranged from Cohen's kappa = .74 to 1. The complete Codebook is available in the Appendix B.

RESULTS: FACEBOOK PAGES

The findings indicate that most of the pages were public groups (74.3%), while around 14% out of 779 pages included in the analysis were categorized as profiles. The finding is expected, as communication, engagement and participation is the most easily achieved in public groups. Also, as the main goal of most of these pages is to 'reveal the real truth' and reach as many people as possible, public group is the easiest way to do it.

It has already been established that disinformation ecosystem does not recognize national borders (Brautović, 2022). Disinformation 'travel' freely across the borders. They travel especially fast and efficiently among countries that share similar languages. In this respect, it is interesting that 41% of all examined pages were in Serbian language and some of them in Cyrillic alphabet. This result is important because it implies that certain issues surpass nationality and political views. Around 34% of all analysed pages originate from Croatia. Pages originating from Bosnia and Herzegovina and Slovenia were present in 5% of cases each, while pages from Macedonia, Montenegro and Kosovo were marginally present in the analysed sample.

Analysis of page profiles revealed that 44% of all examined pages were specialized for some topic other than COVID-19, but on almost all of them, COVID-19 was pervasively present (see Table 2.). These pages were often specialized for conspiracy theories, such as *Ravna Zemlja* (Flat Earth) or *Teorija zavjere* (Conspiracy Theory). Political pages that represent 13% of examined sample, often contained national references like *Obitelj i Domovina* (Family and Homeland), *Mi Hrvati* (We the Croats), *Pravda i pravo za Srbiju* (Justice and Law for Serbia) or SLOVEXIT. Almost 12% of all analysed pages were pages dedicated to a certain person or personal profiles. These pages were also on top of the 'super-spreaders' and the 'most influential' lists (for examples see Brautović, 2022), while pages such as *Glavna grupa stranke Ivana Pernara* (The main group of Ivan Pernar's party), *Grupa podrške Ivana Pernara* (A group of support to Ivan Pernar), *Poštovaoci lika i djela Dr. Branimira Nestorovića* (Supporters of character and actions of Dr. Branimir Nestorović), *Hoćemo Mislava Kolakušića kao ministra pravosuđa i policije!* (We want Mislav Kolakušić as the minister of justice and police!), are among top ten super-spreaders[50]. This finding suggests that personalization is strongly

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50 Branimir Nestorović is a Serbian doctor who was initially a member of the Serbian crisis team for tackling the COVID-19 pandemic. However, he mainly undermined official measures proposed by the government, banalized the danger of COVID-19, campaigned against the vaccine etc., and eventually became the regional 'guru' for those who reject the mainstream pandemic narrative. Ivan Pernar is an eccentric architect of Živi zid (Human Shield), one of the first populist parties in Croatia. ▶

present in this universe, implying that people can more easily connect with an idea or issue if it is identified with or represented by an influential individual.

Activists' pages such as *Građansko buđenje* (Citizens' awakening) or *Buđenje svijesti* (Awakening of consciousness) were detected in almost 10% of the cases. On most of these pages people were called to "wake up", to resist, to refuse vaccines, to join the protests etc. Pages coded as those dedicated to transcendental and religious topics, alternative medicine and spiritual topics in general were found in 9.2% of the cases, and include, for instance, *Biljna ishrana - obučavanje o sirovoj biljnoj ishrani* (Bio diet – education about raw vegan diet), a page dedicated to bio food, health and viruses in general or *Protiv pobačaja* (Against abortion), a page fiercely dedicated to saints and religion.

Profile of Facebook pages (n = 779)	%
Specialised for some other topic	44.2
Political	13.7
Personal profile or a page dedicated to an individual	11.7
Activist, dedicated to fight for the "truth", "freedom" etc.	9.9
Transcendental or religious, dedicated to alternative medicine	9.2
Specialised (dedicated to COVID-19)	3.8
Something else	2.5
'News' page	2.1
Satirical	1.8
Other	0.8
Lifestyle page	0.4

Table 2. Profile of Facebook pages

Conspiracy theories were detected on 57.6% of these pages. This finding suggests that we can, at least to some extent, talk about a system or a 'universe' in which topics change but the logic and discursive set up probably remain

He was a Member of the Parliament from 2016 to 2020; he had been known for his antivaxx positions well before the pandemic. Mislav Kolakušić was a judge of the Commercial Court of Zagreb who resigned in order to be eligible to stand as a candidate in the 2019 election for the European Parliament with his independent list. Kolakušić campaigned by conveying strong populist messages targeting national political elites and addressing corruption. He won the mandate with 7.89% of the vote, despite his low visibility in the mainstream media and discouraging support in the polls of only 2.8% just one month before election day.

the same. Table 3. suggests that populist discourse was vastly present on examined pages. On 58.2% of the pages people are represented as opposing the elites, while 56% of the pages make some reference to "dangerous others".[51] National(ist) cues are present in 47.7% of the cases while religious references were observed on 26.7% of the pages. Call for action was observed on 28.1% of the pages.

Discourse of Facebook pages	%
Conspiracy theories	57.6
Dangerous others	56.4
People against the elite	58.2
National(ist) references	47.7
Religious references	26.7

Table 3: Discourse of Facebook pages

In sum, most of the analysed pages are public groups that originate mainly from Serbia. The most prominent profiles are the pages dedicated to a certain topic that have shifted to COVID-19 related topics, after the outbreak of the pandemic. Conspiracy theories and populist cues were detected on the majority of them.

RESULTS· FACEBOOK POSTS

First set: Posts debunked by Faktograf.hr

Expectedly, most of the posts debunked by Faktograf originate from Croatian Facebook pages (71%) and most of them were posted on private profiles. Significant share of posts (18%) originates from Serbian Facebook pages while some posts originate from pages from Bosnia and Herzegovina (4.7%) and Slovenia (3.3%). Since Faktograf.hr is a "third party fact-checker" for Facebook, the vast majority of the posts in the first set were flagged as false (83%). In terms of the building components, 89.5% of analysed posts contained text, 46.4% had videos, 25.4% featured memes, 18.5% contained photos and 4.3% included illustration (a cartoon or similar). Although text is the most represented element in the sample, the analysis suggests that disinformation content is highly visual, which is very much in line with trends in contemporary news media and political communication (Veneti et al., 2019). Also, the analysis measured only the presence of the text and

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[51]   For definition of populism and its indicators see for instance Mudde (2004), Hawkins et al. (2019).

not its quantity, which means that some posts may have contained only several words of textual announcement for visual content or a link. This additionally amplifies the importance of visual content and indicates that disinformation distributors understand the requirements of the contemporary communication environment.

As for the topics, the posts were first coded for the dominant topic, which means that coders were asked to identify *one dominant* topic in the post. The posts were then coded for the presence of different topics in the post. Table 4. demonstrates the share of dominant topics in the Faktograf set.

	Dominant topic of the post
Conspiracy against the people (to subjugate the people, to strip them of their rights and freedom, to implement the new world order, to implement "total control" and similar)	31.5%
Vaccine (origin, concerns, consequences, effectiveness etc.)	21%
Criticism of pandemic policies in general	18.5%
Protests against pandemic measures, including mask mandate, vaccination etc.	11.2%
Profit and corporate conspiracies (of Big Pharma, Bill Gates and similar)	6.9%
Something else	4%
Criticism of national pandemic measures	2.9%
5G Network	2.5%
Origin of the COVID-19 pandemic	1.4%

Table 4. Predominant topics in the posts

The most represented topic is *conspiracy against the people* which dominates about one-third of examined posts (31.5%). It is followed by vaccine-related topics (21%) and criticism of pandemic measures (18.5%). As for the presence of topics in the posts, criticism of pandemic measures was present in almost half of the posts (47.1%), references to conspiracy against the people were present in 45.7% of the posts, dangerous effects of the vaccine were mentioned in 31.2% and criticism of pharmaceutical industry in 19.9% of the posts. Inefficiency of the vaccine was mentioned in 17.8% of the posts, composition of vaccine in 15.6% of the posts and origins (causes) of the pandemic were present in 13.8% of the posts. Bill Gates was mentioned in 10.9% of analysed posts.

	Authorities used to support the claim
Authority / Person is not mentioned in the post	44.5%
Non-Croatian doctor or a scientist	17%
Common citizen	10.5%
Somebody else	10.1%
Celebrity	7.6%
General terms such as 'experts', 'scientists'	4%
Croatian doctor or a scientist	3.3%
Politicians	2.9%

Table 5. Authorities

The most common sources of authority in this set are non-Croatian 'maverick' doctors and scientists who question mainstream solutions and agendas proposed by governments and mainstream scientists. They are commonly recognized as 'gurus' of the Facebook community immersed in alternative narratives. One such example is a Serbian doctor Branimir Nestorović whose words seem to have prophetic effect on the audiences.

Common citizens with their testimonies appear as the next most relevant source of 'truth' (in 10.5% of the posts).

Some of the posts explicitly criticize mainstream institutions and scientists who advocate mainstream solutions to the COVID-19 crisis: 23.6% of the posts contain criticism of scientists, 14.5% of the posts criticize the media and 12.7% criticize Croatian institutions in charge of the pandemic crisis.

Propaganda techniques	
Fear	41.3%
Banalization (euphemism)	34.4%
Name calling	21.7%
Bandwagon	14.9%

Table 6. Propaganda techniques

Banalization (euphemism) is the next most represented technique, present in 34.4% of the posts. It tends to downsize the severeness of the disease, usually by comparing it to a flu, asserting that the number of deaths of the virus are being exaggerated or similar. Other relatively represented technique is *name calling,* detected in 21% of the posts. Table 7. features some of the labels found in all three sets. The names used to label the process (the pandemic), "us" (the people), "them" (the elites) and the "dangerous others" (people who comply with the measures or "are to blame for the outburst of the pandemic", such as the Chinese) work as powerful discursive mechanisms.

Pandemic	"Them" – elites and creators of the "plandemic"	"Dangerous others"	"The people"
Puppet show	A Davos clique	Homo Idiots / Homo Glupens	Slaves
Plandemic	Globalists	Covidiots	Animals in the ZOO
Corona fraud	Capakovići (Krunoslav Capak, one of the key people in charge of the crisis communication, head of Croatian Institute for Public Health)	Ninja virus	Concentration camp prisoners
Pandemic of lies		Emoji sheep	
#FakeCorona		Corona – vaxxers	
Concentration camp		Pawns	
Nazi-fascist laws		Zombies	
Third Reich		Sheep	
Cabala	Đikići (Ivan Đikić, prominent international scientist, proponent of mainstream solutions to the crisis)		
Dictatorship			
Corona fascism			
Sanitary dictatorship			
Genocide (vaccination)	Đikani of Rothschild medicine		
Yellow Patch (a reference to Holocaust)	Mafia		
Circus corona	Mass murderer virologist (Bill Gates)		
Media and political masquerade	Pharmacomafia		
	Regime media		
	World poisoners		
	Paid poltroons		
	Quacks		
	Mask gestapo		
	Nazis		
	Decadent Western scum		

Table 7. Examples of *name calling* (retrieved from all three sets)

Bandwagon is a propaganda technique aimed at creating a sense of massive engagement - everybody is jumping on the bandwagon (of protests against covid measures, for instance). It was detected in 14.9% of the posts. In addition to propaganda techniques, the posts were coded for two devices that were observed during the coding process. The decision was made to

include them in the codebook and to recode the posts. Creating a sense of 'exclusivity' among the group members is a tactics which works so to convince the members of the community that they have privileged access to information "that the government doesn't want you to see". This tactic is present in 20.7% of the posts. *Call to action* is a persuasive tactics aimed at mobilising followers and encouraging them to "take action" – to take part in the protests, refuse to wear masks, decline vaccine or just to share the post. It is present in more than one-third of the posts (33.7%).

Finally, content analysis examined presence of three discourses – national(ist), religious and populist discourse. The first two discourses were identified through the presence of national and religious reference in the posts (mention of the nation, flag, homeland, God, devil etc.). The post was coded positive for the presence of the populist discourse if it implied that the people are being oppressed by the elites or if it opposed the people to the elites. Additional indicator of the populist discourse was the presence of the "dangerous others" who are, as explained earlier, usually identified among those who comply with the measures or among minorities who "contribute" to the crises (Chinese, migrants etc.). Nationalist discourse was found only in 2.9% of the posts, religious in 8.3%, while populist discourse was identified in 25.7% of the posts, with the "dangerous others" being mentioned in only 5.4% of the posts. These findings suggest that the populist discourse is quite pervasive, which is line with the finding that the "conspiracy against the people" is the most dominant topic in the set.

Second and third set: Posts retrieved from the sets of 'super-spreader' and 'the most influential' Facebook pages

These two additional samples were included in the research to examine if other content on the pages that were 'infected' with disinformation debunked by Faktograf contain similar cues as the initial sample. In this way we expanded our research corpus beyond intended sample outlined by Faktograf. Two additional samples were retrieved from 20 Facebook pages that were classified as the 'most influential' and 20 Facebook pages that were classified as the 'super-spreaders'. From each of these two sets we generated 300 posts with the biggest engagement, measured by the number of 'shares'. In the super-spreaders' set number of shares ranged from 1990 to 227; in the 'most influential' set number of shares ranged from 26369 to 376 shares. The most shared post in the 'super spreaders' set is a meme from a Slovenian page *Otrok ne damo* (We'll protect our kids); the most shared post from the 'most influential' set is a native video from a 'news' site *Logično*. We eliminated the posts that were unrelated to COVID-19, narrowing the sample down to 200 posts from 'the super-spreaders' set and 135 from 'the most influential' set.

It is important to emphasize that the posts from these two samples have not been treated as disinformation (unlike the posts from the Faktograf set). Only 5.9% of the posts from the super-spreaders set and 6% of the posts from the most influential set were flagged as false by Facebook. However, our starting assumption was that these samples may demonstrate similar features as the posts from the Faktograf sample.

The first interesting finding is that most posts from 'the super-spreaders' (SUS) and 'the most influential' (MI) set originate from Serbian Facebook pages (53.3% and 77.5% respectively). Other posts in the SUS set originate from Slovenian and Croatian FB pages (26.7% and 20% respectively) while other posts in the MI set were published on the pages from Croatia (12%), Bosnia and Herzegovina (9.5%) or some other country (1%).

Most of the posts in both sets contained text (62.2% in the SUS set and 67.5% in the MI set). While 'super-spreaders' predominantly relied on links to different sources (mainstream media, alternative media, YouTube videos and similar) to support their claims (in 47.6% of the posts), 'most-influential' posts relied primarily on videos (in 50% of analysed posts from that set). Interestingly, top 20 most shared posts from our MI set all contained native videos. Top 20 most shared posts from the SUS set were text based or focused on memes, photos, links to mainstream or alternative media and in several cases contained native video.

Other elements used in the SUS set were photos (34.8%), memes (28.1%), videos (13.3.%) and illustrations in 4.4% of the posts. Other elements used in the MI set were memes (38.5%), links (15.5%), photos (8.5%) and illustrations in 1% of the posts.

	Dominant topic of the post	
	'Super-spreaders'	'Most influential'
Origin of the COVID-19 pandemic	1.5%	0.5%
Vaccine (origin, concerns, consequences, effectiveness etc.)	14.8%	20%
Protests against pandemic measures, including mask wearing, vaccination etc.	22%	22.5%
Criticism of pandemic policies in general	17%	14.5%
Criticism of national pandemic measures	11.9%	10.5%
Profit and corporate conspiracies (of Big Pharma, Bill Gates and similar)	4.4%	4.5%
Conspiracy against the people (to subjugate the people, to strip them of their rights and freedom, to implement the new world order, to implement "total control" and similar)	17.8%	22%
5G Network	5.2%	0.5%
Something else	5.2%	5%

Table 8. Predominant topics in SUS and MI posts

Most posts in both sets predominantly focused on protests, followed by conspiracy against the people in both sets and then by the criticism of pandemic policies in the SUS set and vaccine-related topics in the MI set.

Presence of topics in the posts is presented in Table 9.

	Presence of topics in the posts	
	"Super-spreaders"	"Most influential"
Origin of the COVID-19 pandemic	12.6%	9%
Composition of the vaccine	5.9%	5.5%
Consequences of the vaccine	14.1%	11%
Inefficiency of the vaccine	12.6%	12.5%
Criticism of pharmaceutical industry	9.6%	12%
Bill Gates	5.2%	9%
Conspiracy against the people (to subjugate the people, to strip them of their rights and freedom, to implement the new world order, to implement "total control" and similar)	28.1%	34%
Criticism of pandemic measures	52.6%	62.5%

Tablica 9. Prisutnost tema u skupovima SUS i MI

Criticism of pandemic policies and measures is present in majority of examined posts in both sets. Conspiracy against the people is well represented but still significantly less than resistance to policies that imposed a new framework of life.

Authorities used to support the claim are listed in Table 10.

	Authorities used to support the claim	
	"Super-spreaders"	"Most influential"
Celebrity	4.4%	6%
Croatian doctor or a scientist	4.4%	1.5%
Non-Croatian doctor or a scientist	16.3%	10%
General terms such as "experts", "scientists"	2.2%	1.5%
Politicians	8.9%	6%
Common citizen	8.9%	12.5%
Somebody else	10.4%	7.5%
Authority / person is not mentioned in the post	44.4%	55%

Tablica 10. Autoriteti korišteni kao dokaz vjerodostojnosti objave u skupovima SUS i MI

Most of the posts in both our sets do not make a reference to another person (authority) to support their argument. It would be worthwhile to examine if such behaviour is an indicator of what Liesbet Van Zoonen (2012: 17) identifies as *I-pistemology*, a notion that in a context of declining trust in traditional knowledge institutions (politics, media, universities) *I*, *myself*, become the "origin of all truth".

Those posts that use another person's authority to support their argument rely mostly on non-Croatian doctors and scientists or common citizens. The former are more prominent in the SUS set and the latter in the MI set. This is particularly interesting because some of the most prominent super-spreader pages are basically fan pages devoted to promotion of certain individuals, such as *Poštivaoci lika i djela Branimira Nestorovića* (Admirers of character and actions of Branimir Nestorović, see Image 1).

Image 1. Posted on Poštovaoci lika i djela dr. Branimira Nestorovića: "The days are beautiful, go out and hang out, you all probably already have corona, why would you be afraid then."

Both sets contain criticism of scientists who advocate official solutions, as well as the media who promote these solutions, along with the official narrative. In the SUS set mainstream scientists are criticized in 17.8% of the posts and media in 11.1% of the posts. In the MI set scientists are criticised in 22.5% of the posts and media in 13% of the posts. Croatian institutions in charge of the pandemic are being criticised in 10.4% of the posts in the SUS set and 3.5% of the posts in the MI set. These results suggest that the tactics of a relevant number of influencers and super-spreaders is to encourage suspicion in science. Distrust of science is, according to Mirjana Tonković et al. (2021), an important predictor of conspiratorial thinking in Croatia. More-over, Tonković et al. (2021: 9) suggest that: "... many COVID-19 conspiracies imply that scientists and science are to be blamed for the pandemic (e.g., COVID-19 originated from the science laboratory, COVID-19 vaccine exists but it is kept secret, the real number of infected people is hidden, etc.)".

	Propaganda techniques	
	'Super-spreaders'	'Most influential'
Bandwagon	22.2%	25%
Fear	32.6%	23%
Name calling	19.3%	24%
Banalization (euphemism)	29.6%	37%

Table 11. Propaganda techniques

In terms of propaganda techniques, both examined sets demonstrate similar characteristics. Nevertheless, dominant strategy of influencers is *banalization*, while super-spreaders are most likely to resort to *fear*. Also, compared to the Faktograf set, they are more likely to use bandwagon, which makes sense given that protests are the main topic in SUS and MI sets. Image 2. illustrates the use of the bandwagon technique in relation to protests.

Image 2. The use of *bandwagon*: "St. Marko's Square: WE SHALL ALL BE THERE! The D Day. Article 23. Of Croatian Constitution: (1) Nobody can be subjected to any type of harassment or to medical or scientific experiments, without his/her consent. #NOSURRENDER, PEOPLE'S REFERENDUM"

Call for action was detected in almost one third of examined posts in both sets (28.9% and 28% respectively), while suggestion that the community is being granted a privileged information was weakly represented, with 6.7% in the SUS set and 6% in the MI set.

Finally, the analysis has revealed that, like in the initial set, the most prominent discourse in examined posts from SUS and MI sets is *populist discourse*. It was observed in 22.2% of the posts from SUS set and 37% of the

posts in the MI set. "Dangerous others" were significantly more present in the SUS set than in the MI set (10.4% compared to 4%), which is in line with the choice of propaganda techniques and the supers-spreaders' dominant reliance on fear (see Image 3).

National references were present in 5.9% of the posts in the SUS set and 10% of the posts in the MI set. Religious references were present in 5.2% of the SUS posts and in 5.5% of the MI posts.
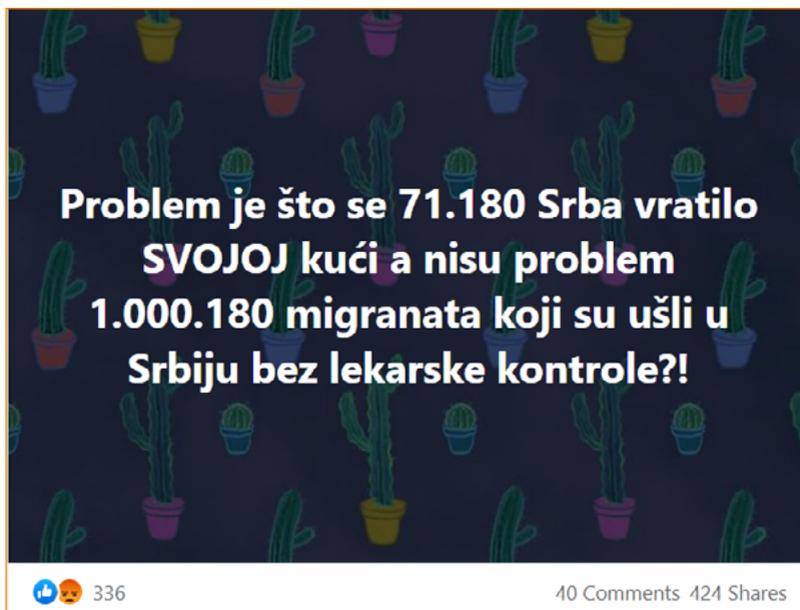
Image 3. "Dangerous others" in the SUS set: "The problem is that 71.180 Serbs returned to THEIR OWN home while 1.000.180 migrants who entered Serbia without medical control is not a problem?!"

DISCUSSION AND CONCLUSION

This study is one of the first content analyses of COVID-19 related disinformation posted on Facebook in Croatia. Its goal was to understand how disinformation is constructed and to examine topics, agents, propaganda techniques and discourses that appear in the universe that at some point engaged with disinformation. Analysis was conducted using two units of analysis – a Facebook page and a Facebook post. The sample of pages and posts for content analysis was constructed based on a population of disinformation debunked by a Croatian independent fact-checking organization Faktograf. We used social network analysis to expand Faktograf's initial set and to capture universe of Facebook pages that were 'infected' with disinformation. We used this expanded universe to retrieve sample of pages and additional sample of posts.

The analysis of 779 Facebook pages points to three main conclusions. First, the majority of examined Facebook pages entangled in Croatian disinformation universe are from Serbia. This suggests that the influence of Serbian disinformation hubs in Croatia is substantial. Second, the analysis indicates that the Facebook pages captured by our SNA are generally prone to conspiracy theories. It means that topics change, but discourses tend to remain the same. The most robust in this sense is a populist discourse observed in almost 60% of the pages. This is very much in line with the survey research of Tonković et al. (2021) who found out that almost a quarter of respondents in Croatia agreed with conspiracy theories related to COVID-19 and that belief in conspiracies was associated with lower levels of education, lower economic standard, greater role of religion and lack of political self-identification (2021: 7). Deconstructing relationship between populist sentiment and susceptibility to conspiracy theories represents a potent avenue for future research. Another important finding related to Facebook pages pertains to the profile of the pages. The best represented are the pages 'specialized' for certain topics, quite often for conspiracy theories, such as *Ravna zemlja* (Flat Earth). However, interesting is the influence of private profiles in the sample, as well as the influence of fan pages that are dedicated to idolization of a single person (usually a maverick politician or a doctor). These individuals tend to acquire status of 'gurus' in their community and to become faces of resistance and struggle for 'real truth'. Therefore, it seems vital to address authority and persuasive power of these influencers in future studies.

The analysis of Facebook posts included disinformation debunked by a Croatian fact-checking organization Faktograf, as well as two additional sets of posts retrieved from Facebook pages that were 'infected' by disinformation identified by Faktograf. The structural difference between the

Faktograf set and additional two sets, that include the most shared posts from the 'most influential' and the 'super-spreader' Facebook pages from our universe is that a) posts from the Faktograf set are treated as disinformation while posts from the other two sets are not and b) Faktograf set represents a population of debunked posts while the other two sets represent a sample generated by SNA.

Majority of posts debunked by Faktograf were predominantly focused on conspiracy theories i.e., assumption that powerful elites secretly manipulate the events for their own benefit and in such a way to harm the people. The most prominent agents in these posts, when they are mentioned, are dissident doctors or scientists who come to embody resistance against mainstream policies and approaches. The most prominent propaganda technique in these posts is fear, usually of vaccine and other policies and approaches deployed to fight the pandemic. Name calling, that appears in about 20% of debunked posts, is an important discursive mechanism that seems to strengthen the identity of "us" (the people) against "them" (the elites and others who endanger the people). While references to religion and nation where only vaguely present, populist discourse was observed in one quarter of posts debunked by Faktograf.

The other two sets are probably more representative of the entire universe. Interestingly, almost all analysed posts, from all three sets, predominantly focus on one of the topics offered in the codebook suggesting that the posts that are not *a priori* considered disinformation, demonstrate similar features as the posts debunked by Faktograf. Dominant topics in the 'most influential' and the 'super-spreaders' set are protests, followed by conspiracy theories. However, criticism of pandemic measures is present in the majority of examined posts, which suggests that people were utterly annoyed by the 'new normal' and imposed framework of life that distorted their routines and reduced their freedoms. The analysis of key agents and authorities has revealed that, like in the Faktograf set, the most prominent sources of authority are non-Croatian doctors and scientists, followed by 'ordinary citizens'. These two sets also contain criticism of mainstream actors, primarily of mainstream scientists and then of the mainstream media. This finding suggests that raising suspicion and cynicism about science is an indicative feature of the examined universe.

In the 'super-spreader' set the most used propaganda technique is again, fear, followed by banalization or efforts to downplay or even ridicule the danger of the pandemic. In the 'most-influential' set the most prominent technique was banalization, followed by the bandwagon. Populist discourse was rather well represented in both sets. National(ist) cues were considerably less represented, while references to religion were observed only in few posts.

In sum, the results of content analysis suggest that there are considerable similarities between characteristics of the posts containing disinformation debunked by a Croatian fact-checker and other contents in the adjoining universe charted by SNA. The findings emphasise the regional character of the disinformation network, which consequently points to the relevance of the regional fact-checking networks. The research also indicates the importance of certain personalities who come to embody alternative narratives. The results suggest that the COVID-19 related contents in the examined universe boil down to a handful of topics and their variations: conspiracy theories, including introduction of the "new world order" and "total control", vaccine, criticism of pandemic measures, topics related to protests and resistance against the measures and finally, the role of Big Pharma, Bill Gates and 5G network. Propaganda strategies that we tested in this study were found in all three sets, with the fear and banalization (euphemism) being the most prominent techniques. Intensive reliance on visual elements to convey the message suggests that communicators in this universe are very well acquainted with the logic of contemporary communication matrix. Particularly relevant is the finding that the most shared posts in our data set were native videos.

Although the findings suggest that the conspiratorial discourse is entrenched in the examined universe, the study also captured strong resistance and disdain for pandemic measures. This may suggest that disappointment with how institutions have been handling and communicating the crisis is pushing the audiences towards disinformation and conspiracies.

Limitations

There are several limitations to this study. The most important one is accessibility and availability of Facebook pages and posts, which is a matter of Meta's policies. This problem has been addressed by researchers world-wide.

One of the contributions of this project is that it developed automated solution to store screenshots of Facebook posts, saving them from disappearing.

However, much of the Facebook content remains unavailable to researchers. Other limitations mainly concern our research design created to analyse Facebook pages. First, we measured only presence of certain elements on the page and not their prominence. For instance, we don't know if conspiracy theory appeared only once on examined page or if conspiracy theories appear systematically. Second, the page may contain contents that challenge narratives and discourses detected in our research, but they were not

investigated in this study. Third, a significant number of pages that were not in the former Yugoslav languages were excluded from the research. Fourth, our entire research is based on a population of selected posts (filtered and debunked by Faktograf) and on a sample retrieved from the universe captured by SNA which is again, based on the same set of debunked disinformation. Therefore, the results presented here may be biased and should be considered representative only of the population captured by SNA. Finally, the research of disinformation content should be expended to other types of outputs (e.g., mainstream media) that contribute to dissemination of disinformation, as suggested by Wardle's (2018) "trumpet of amplification".

Research perspectives

Important research perspectives within and beyond Pro-Fact project include:

- ▶ investigating the role of populism in disinformation universe and its relationship to conspiratorial thinking;
- ▶ investigating power and influence of disinformation 'gurus';
- ▶ applying automated content analysis on a larger sample of posts, based on a codebook attached to this study (see Appendix B) and
- ▶ investigating the role of mainstream media in disinformation universe by automatically detecting all posts that contain content that originates from mainstream media (links, photos, videos etc.) and analysing its use and purpose in the posts.

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CODE SHEET· FACEBOOK PAGES

ID _____

- ▸ **Data set**
    1. The most influential
    2. Super-spreaders

- ▸ **Origin of the Facebook page**
    1. Croatia
    2. Serbia
    3. Bosnia and Herzegovina
    4. Slovenia
    5. Other country (if possible, register which one)

- ▸ **Type of the FB page**
    1. Private profile
    2. Page (business/brand)
    3. Page (community/public person)
    4. Public group
    5. Private group
    6. Event

- ▸ **Profile of the FB page**
    1. Fan page (dedicated to promotion (usually also glorification) of one person, e.g., Mislav Kolakušić, Ivan Pernar, Branimir Nestorović)
    2. Specialized (dedicated to corona / COVID-19)
    3. Specialized for some other topic (which one?)
    4. Political
    5. Satirical
    6. 'News' page
    7. Lifestyle page
    8. Activists' page (dedicated to fight for 'truth', 'freedom', 'redemption', 'liberation' etc.)
    9. Transcendental or religious (i.e., dedicated to transcendental or religious topics, spiritual growth or similar)
    10. Something else

    Note: This is not an official Facebook categorization of the page. You need to assess what is the self-identification of the page or what is the main focus of the page and code accordingly.

DISCOURSE

▸ Does the page contain conspiracy theories (e.g., chemtrails, digital control, conspiracies related to migrants, vaccination, USA and similar)?
1. Yes
2. No

▸ Does the page confront the people to elites?
1. Yes
2. No

▸ Does the page identify 'dangerous others' (e.g., migrants, sexual or ethnic minorities, European Union etc.)?
1. Yes
2. No

▸ Does the page contain religious references (verbal such as 'God, devil' or visual symbols, such cross or similar)?
1. Yes
2. No

▸ Does the page contain nationalist references or symbols (verbal, such as 'homeland', 'we the Croats', 'brothers Serbians', or visual, such as national flag etc.)?
1. Yes
2. No

▸ Does the post contain call to action (e.g., 'Don't get vaccinated! Join the rally! Don't mask up! Teach your children how to refuse tests', etc.)?
1. Yes
2. No

CODE SHEET· FACEBOOK POSTS

THE STRUCTURE

ID _____

- ▸ Data set
    1. The most influential
    2. Super-spreaders
    3. Faktograf.hr

- ▸ Origin of the Facebook page that posted the post
    1. Croatia
    2. Serbia
    3. Bosnia and Herzegovina
    4. Slovenia
    5. Other country (register which one)

- ▸ Type of the FB page that posted the post
    1. Private profile
    2. Page (business/brand)
    3. Page (community/public person)
    4. Public group
    5. Private group
    6. Event

- ▸ Profile of the FB page that posted the post
    1. Fan page (dedicated to promotion (usually also glorification) of one person, e.g. Mislav Kolakušić, Ivan Pernar, Branimir Nestorović)
    2. Specialized (dedicated to corona / COVID-19)
    3. Specialized for some other topic (which one?)
    4. Political
    5. Satirical
    6. 'News' page
    7. Lifestyle page
    8. Activists' page (dedicated to fight for 'truth', 'freedom', 'redemption', 'liberation' etc.)

9. Transcendental or religious (i.e., dedicated to transcendental or religious topics, spiritual growth or similar)
10. Something else

Note: This is not an official Facebook categorization of the page. You need to asses what is the self-identification of the page or what is the main focus of the page and code accordingly.

▶ **Has Facebook labelled the post as a false information?**
1. Yes
2. No

▶ **Period in which the post was published:**
1. First wave - March - June 2020
2. Second wave - August 2020 - February 2021
3. Third wave - March - June 2021
4. Fourth wave - August - December 2021
5. Fifth wave - July 2022 -

The post contains:

▶ Text	1. Yes	2. No
▶ Video	1. Yes	2. No
▶ Link	1. Yes	2. No
▶ Photo	1. Yes	2. No
▶ Meme	1. Yes	2. No
▶ Illustration	1. Yes	2. No

TOPICS

13. The dominant topic of the post is:
1. The origin of the pandemic and the virus COVID-19 (e.g., virus was produced in the lab etc.)
2. Vaccine (origin, consequences, effectiveness or expediency, vaccine refusal etc.)
3. Protest against measures and/or vaccine (protests, boycott of different COVID-19 measures, mobilization to join the protests, 'people are rising' etc.)
4. Criticism of pandemic measures in general
5. Criticism of national pandemic measures (e.g., Croatia, Serbian, criticism of the crisis communication headquarters etc.)
6. Profit and/ or global conspiracy of big corporations (e.g., big pharma, Bill Gates, George Soros),
7. Conspiracy against the people and/or humanity aimed at supressing the people and introducing the new world order ('system of total control' or similar)
8. Introduction of 5G network and its consequences
9. Something else (what?)
Note: Although more than one topic will appear in most of the posts, try to assess which SINGLE topic is the most dominant.

The post mentions:
▸ Causes /origins of the pandemic and the COVID-19 virus
   1. Yes   2. No
▸ Composition of the vaccine (e.g., chips, foetuses)
   1. Yes   2. No
▸ Consequences of the vaccine (e.g., causes death and similar)
   1. Yes   2. No
▸ Inefficiency of the vaccine
   1. Yes   2. No
▸ Pharmaceutical industry and its profit from the pandemic
   1. Yes   2. No
▸ Bill Gates
   1. Yes   2. No
▸ Global conspiracy against humanity
   1. Yes   2. No

▸ Does the post contain criticism of pandemic measures (e.g., of Covid passes, lockdowns or similar)?
  1. Yes
  2. No

SOURCES AND AUTHORITIES

▸ Source used in the post to support the main argument:
  1. Croatian mainstream news outlet
  2. Foreign mainstream news outlet
  3. Alternative news outlet (non-mainstream)
  4. Alternative YouTube channel
  5. Facebook post of an individual
  6. Medical journal
  7. Something else
  8. No source
  Note: If you code 1 or 2, write down the name of the news outlet.

▸ Actors mentioned in the post to support the main argument:
  1. A celebrity (e.g.., Novak Đoković, Toni Cetinski, Jordan Peterson …)
  2. Croatian doctor or scientist
  3. Foreign doctor or scientist (e.g., Dr. Branimir Nestorović)
  4. 'Experts' or 'scientists' in general, without mention of a name
  5. A politician (e.g., Marin Miletić, Mislav Kolakušić, Zoran Milanović …)
  6. 'Common people' (acquaintances, students, participants in demonstrations, people who provide their testimonies etc.)
  7. Somebody else
  8. There is no actor
  Note: If you code 1, 2, 3 or 4, write the name of the actor.

▸ Does the post criticize scientist(s) who advocate vaccination / measures / claim that corona is a dangerous disease?
  1. Yes, it criticises his/her/their theses and statements
  2. Yes, it questions his/her/their scientific credibility
  3. Yes, it criticises his/her/their theses and statements and questions his/her/their scientific credibility
  4. No

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▸ Does the post criticize Croatian institutions (the Headquarters, the Government, Croatian Institute for Public Health, ministries …) and/or their pandemic related measures, statements and activities?
1. Yes
2. No

▸ Does the post criticize mainstream media reports (e.g., 'they are lying', 'they are hiding the truth from you'…)?
1. Yes
2. No

DISCOURSES AND PROPAGANDA TECHNIQUES

▸ Does the post confront the people to elites (e.g., 'They are enjoying themselves while people suffer.')
1. Yes
2. No

▸ Is there a reference to "dangerous others" in the post (to a group which allegedly endangers the people and 'us', such as 'the migrants who brough us COVID-19', vaccinated people, Chinese etc.).
1. Yes
2. No

▸ Does the post use 'bandwagon' technique'? (Creating an impression that everybody is doing something – 'jumping a bandwagon'. E.g., 'mass support', 'everybody is joining the protests', 'the people are rising' etc.).
1. Yes
2. No

Note: Pay attention to visual elements in the posts. Bandwagon effect may be created using visual images only.

▸ Is fear present in the post i.e., is the post trying to scare someone?
1. Yes
2. No

▶ Does the post contain religious references (verbal such as 'God, devil' or visual symbols, such cross or similar)?
   1. Yes
   2. No
   Note: Write them down.

▶ Does the post contain nationalist references or symbols (verbal, such as 'homeland', 'we the Croats', 'brothers Serbians', or visual, such as national flag etc.)?
   1. Yes
   2. No

▶ Does the post contain 'empty signifiers' (e.g., freedom, salvation, new normal etc.)?
   1. Yes
   2. No

▶ Does the post contain 'naming' or 'stereotyping' (e.g., COVID-dictator, COVID-fascism, Nazis, Third Reich)?
   1. Yes
   2. No

▶ Does the post tend to downsize the danger of COVID-19 (e.g., 'it is a flue, death rates are being exaggerated' etc.)?
   1. Yes
   2. No

▶ Does the post suggest that shared information is 'exclusive' (e.g., 'You won't find this in the media')?
   1. Yes
   2. No

▶ Does the post contain call to action (e.g., 'Don't get vaccinated! Join the rally! Don't mask up! Teach your children how to refuse tests. Share this post as much as you can', etc.)?
   1. Yes
   2. No

6

Prevalence, Structure, and Trends of Conspiratorial Beliefs:
The Analysis of Croatian Citizens With Different Level of Susceptibility to COVID-19 Conspiracy Theories

dr. NEBOJŠA BLANUŠA
Faculty of Political Science, University of Zagreb

dr. MIRJANA TONKOVIĆ
Faculty of Humanities and Social Sciences, University of Zagreb

dr. ANDREA VRANIĆ
Faculty of Humanities and Social Sciences, University of Zagreb

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INTRODUCTION

This report - as an integral part of multidisciplinary *Pro-Fact project* research activities - focuses on the analysis of citizens with the different level of susceptibility toward COVID-19 conspiracy theories, together with their proclivities towards beliefs in other, previously developed, wider and more specific forms of conspiracism. This research leans on previous phases of the project activities, namely the social network analysis (Brautović, 2022a), the dynamic network analysis (Brautović, 2022b), and especially on the content and discourse analysis (Grbeša Zenzerović, Vučković, 2022), which we used as informational sources in the creation of measurement instruments for this survey. In that sense, after the "online" research phases focused on the digital spread of COVID-19 disinformation eco-systems, we now focus on "offline" issues, such as how widely identified disinformation, especially conspiracy theories, are spread among Croatian citizens. This report is also tightly related to another one regarding behavioral correlates of COVID-19 conspiracy theories (Tonković, Vranić, Blanuša, 2022). These two reports are based on the same methodological approach, database and respondents. With the aim to identify which groups of citizens are susceptible to disinformation and conspiracist beliefs related to COVID-19 pandemic, we conducted a national survey on the nationally probabilistic sample composed of 1401 Croatian citizens. To get more insight into their possibly wider conspiracist/ non-conspiracist frame of mind, we also assessed their proclivity toward general conspiracism, beliefs in global and local (Croatian) conspiracy theories. This report gives an overview of this part of the survey results.

It focuses on the following research questions regarding COVID-19 conspiracy theories:

▶ What is the prevalence of beliefs in the previously online identified COVID-19 conspiracy theories among Croatian citizens?
▶ In comparison with previously obtained results, do conspiracy theories regarding COVID-19 increase or decrease over time?
▶ What is the structure of beliefs in conspiracy theories regarding COVID-19 in comparison to other forms of conspiracisms?
▶ What is the relationship of beliefs in conspiracy theories regarding COVID-19 and some already developed forms of conspiracisms, such as beliefs in local and global conspiracy theories (Blanuša, Kulenović, 2018), conspiratorial mentality (Bruder et al., 2013), beliefs in conspiracy theories related to populism (Blanuša, Kulenović, 2018), and beliefs that evil forces are 'taking my country away' (Parker, Barreto, 2013)?

▶ Which citizens believe in conspiracy theories regarding COVID-19 in terms of their socio-demographic characteristics, relationship to science, media usage, and political characteristics?

METHODOLOGY

Data collection for this study was conducted online by Ipsos Croatia, from April 29th to May 17th, 2022, on the sample of 1401 adults, aged from 18 to 64. The sample was a national probabilistic sample, representative for the Internet users, double stratified by region (6) and size of settlement (4), with additional quotas for age (4) and level of education (3).

Out of 1401 participants, 717 (51.2%) were women. Average age was $M = 42.6$ ($SD = 13.05$). In terms of education 2.7% have finished elementary school, 71.3% have finished high school and 25.8% had a BA or higher degree. Regarding the size of their residence, 34.4% of our participants came from settlements with up to 2000 residents, 16.8% came from settlements with 2001 to 10000 residents, 21.1% from settlements with 10001 to 80000 residents and 27.8% from settlements with over 80000 residents.

Conspiracy theories regarding COVID-19 were extracted from the previously conducted content and discourse analysis (Grbeša Zenzerović, Vučković, 2022), while other measurement instruments were mostly used from previous studies and scientific publications.

RESULTS

PREVALENCE OF BELIEFS IN COVID-19 CONSPIRACY THEORIES AMONG CROATIAN CITIZENS

By relying on the thorough content and discourse analysis of online disinformation sources which have discerned a specific plandemic vocabulary (Grbeša Zenzerović, Vučković, 2022: 15), and previous regional studies (e.g., Tonković et al., 2021; Unicef Montenegro, 2021), we constructed 16 Likert-type conspiratorial statements which were used in the survey. Participants were asked to express the level of their belief in each of these conspiracy theories, on a scale from 1 to 5, where 1 means "Completely disbelieve", 2 "Mostly disbelieve", 3 "Believe and disbelieve", 4 "Mostly believe", and 5 "Completely believe". General results about the percentage of those who mostly and completely believe in COVID-19 conspiracy theories are presented in the Graph 1.

Value	Statement
49,7	Statistics are manipulated in order to exaggerate the number of people who die from corona, when in fact they were already sick from another disease from which they eventually died.
35,7	COVID-19 was deliberately produced and purposefully spread so that the world powers could benefit politically or economically from it.
35,3	Corona was manufactured by the pharmaceutical lobby to get rich from selling vaccines.
33,4	COVID-19 is no more dangerous than the seasonal flu, but it is exaggerated in order to establish more effective population control and limit human freedoms and rights.
31,3	The world elites created the virus with the aim of collapsing some of the world's economies in order to benefit financially from it.
25,4	The world elites created COVID-19 to decrease the number of people on the planet
23,8	Corona-measures are a deliberate preparation for changing the current way of life and an introduction to a digital fascist dictatorship.
23,1	To protect their profits, agricultural companies deliberately hide scientific evidence that genetically modified crops lead to genetic contamination that can allow viruses like COVID-19 to multiply and spread.
22,9	Chinese scientists created the coronavirus for biological warfare, but it accidentally escaped from the laboratory
20,5	The Croatian authorities are lying according to the instructions of the UN and WHO and are working against the Croatian people in an unconstitutional manner so that we get sick and go bankrupt.
19,9	Chinese scientists created the virus and deliberately released it from the lab because they already had a cure for it.
18,6	The pandemic was artificially produced to reduce migration and immigration of people from poorer and war-torn countries to richer Western countries.
16,7	World's elites created COVID-19 to genetically modify human beings by means of the vaccines against the virus
11,8	The US military created COVID-19 as a biological weapon and deliberately spread it in China to weaken it as a competitor.
9,2	COVID-19 was artificially created in order to implant chips into humans through vaccines to monitor and control behavior.
8,1	5G technology is causing or spreading COVID-19, but this is being covered up so that the corporations working with this technology can continue to make a lot of money.

Graph 1. Percentage of Croatian citizens who believe in COVID-19 conspiracies (*N*=1401)

These results show that almost 50% of Croatian citizens (18 - 64 years old) believe that official numbers about the death-rate from coronavirus have been manipulated and exaggerated, presumably done by adding the number of people who died with corona, but from other diseases they have already had. Another similar conspiratorial statement endorsed by 33,4% of citizens considers that COVID-19 is no more dangerous than the seasonal flu, but it is exaggerated with the purpose of more effective population control and limitation of human freedoms and rights. The next group of COVID—19 conspiracy theories endorsed by more than 25% of Croatian citizens is mostly about the secret and detrimental influence of the global-level actors, such as world powers, world elites and pharmaceutical lobbies, who are trying to get more political or economic power and control at dispense of "ordinary citizens". Less popular conspiratorial interpretations also mention agricultural companies, Croatian authorities, and World Health Organization as other major culprits of global troubles. Furthermore, in the eyes of some Croatian citizens, it is more probable that Chinese scientists are responsible for spreading the virus (22,9% and 19,9%), than the US military (11,8%). The two least believed COVID—19 conspiracy theories are about artificial creation of coronavirus in order to implant microchips into humans via vaccines, in order to monitor and control behavior (9,2%), and that 5G technology is causing or spreading COVID-19, which is covered up (8,1%).

In addition to the previous 16 conspiracy theories, we added two non-conspiratorial interpretations, to test the relationship of conspiratorial thinking with the Darwinist and religious explanations of the causes of the pandemic. According to our results, 52,6% of participants believe that COVID—19 pandemic is a natural process which has similarly occurred previously in the history of mankind, in which the weakest die and the strongest survive, while only 8,1% of them believe that it is God's punishment for all the evil that humans have done on planet Earth. In the next step we conducted a network correlational analysis in JASP[52], including 16 conspiratorial and two non-conspiratorial items. The results are shown in the Graph 2.

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52   JASP is an open source statistical program supported by the University of Amsterdam, available at: https://jasp-stats.org/.

LEGEND: Each circle represents one item. Blue lines represent positive and red lines represent negative correlations between items. The stronger the correlation between the items, the darker, thicker and shorter the line between them is. Due to the economy of presentation, individual COVID−19 conspiracy theories are presented by the statement number within the scale, while the Darwinian and religious explanations are marked with abbreviated names.
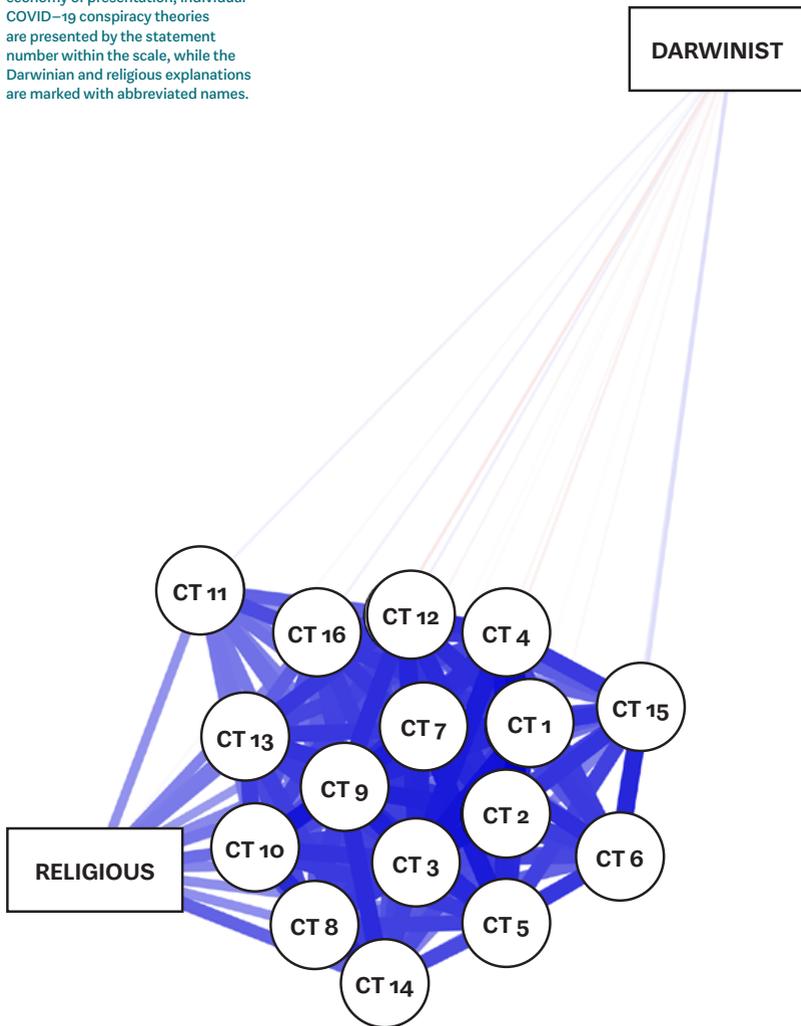
Graph 2. Network of bivariate correlations among conspiratorial and non-conspiratorial interpretations regarding the cause of COVID - 19 pandemic.

This kind of analysis provides a spatial representation about the relationships among analyzed beliefs that is easy to interpret. First, we see that conspiratorial interpretations about COVID-19 comprise a very dense network, suggesting if someone believes in one of such conspiracy theories, it is highly probable that he/she will believe in others. The average correlation among all conspiratorial items is .652, which means that believing in COVID-19 conspiracy theories is a monolithic way of thinking. Also, it is obvious that such a way of thinking is much closer to a religious thinking than a Darwinian explanation of the pandemic. Average correlation between Darwinian and conspiratorial interpretations is .001, while the correlation between religious and conspiratorial interpretations is .317. What is also interesting is that the religious explanation of the pandemic correlates in highest degree with 5G (.433) and microchip implantation (.398) conspiracy theories. Our further analysis of average bivariate correlations also revealed that believing in COVID-19 conspiracy theories correlates with distrust in science[53] (.467), lower scientific literacy[54] (-.319), lower actively open-minded thinking[55] (-.282), lower political literacy[56] (-.262), higher national narcissism[57] (.315), and stronger perception of elites and media establishment as sources of fake news[58] (.205).

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[53]   The scale we use to estimate mistrust of science was developed by Hartman et al. (2017), composed of 6 items.

[54]   The scale we use to estimate scientific literacy was developed by Rutjens et al. (2018), composed of 9 items.

[55]   The scale we use to estimate scientific literacy was developed by Baron et al. (2015).

[56]   Political literacy was estimated through the multiple choice answers to questions originally developed at the Faculty of Political Science, University of Zagreb, as a part of larger survey questionnaire measuring electoral behavior. It is comprised of the following five questions: What are civil society organizations? What is the political opposition? Which of the following types of parties advocates minimal state intervention in economic activities? Which of the following types of parties accepts certain restrictions on the personal freedoms of citizens in order to protect morals and traditional values? The political system in the Republic of Croatia is...?

[57]   The scale we use to estimate mistrust of science was developed by Golec de Zavala et al. (2009), composed of 6 items.

[58]   For the purpose of this study we developed the following question: Who is responsible for creating fake news and spreading false information in Croatia? On the scale from 1 (not responsible) to 5 (very responsible) our participants gave answers for the next 9 sources: politicians, journalists and editors, conspiracy theorists, civil society associations and activists, citizens, security services, foreign countries, corporate lobbies, social networks. Factor analysis revealed two factors. The first one was names the perception of elites & media establishment as sources of fake news, and the second one as perception of citizens, conspiracy theorists and social media as sources of fake news. In this study we use obtained factor scores as variables in the analysis.

TRENDS IN THE LEVEL OF BELIEFS IN COVID-19 CONSPIRACY THEORIES

To investigate if beliefs in COVID-19 conspiracy theories have increased or decreased in the last three years, we have compared our results with those obtained in an earlier project, funded by the Croatian Science Foundation, titled ReSPoC (*(Re)building society: A longitudinal study of post-corona social recovery in Croatian general population*). ReSPoC project measured beliefs in COVID-19 conspiracy theories on the same type of sample in four time points from September 2020 to March 2022. However, there are certain limitations in comparing those results with the Pro-fact project data. ReSPoC has used 10 items to assess conspiracy beliefs regarding COVID-19, which have been constructed at the beginning of the pandemic in 2020. Pro-fact team constructed 16 items in 2022, mostly based on the vocabulary discerned from the social networks of disinformation sources and additional analysis of their content and discourse. In these two years, the initial COVID-19 conspiracy theories became more specific, richer in terms of their content and the vocabulary, and so were the items in the Pro-fact survey. However, as those two sets of items deal with the same general and specific topics, it is justified to compare their average results. They are shown in the next graph, where the first four columns represent the results obtained in ReSPoC project, while the last one represents the Pro-fact results.

In comparison with previous four points of measurement, it seems that believing in COVID – 19 conspiracy theories has only slightly decreased.
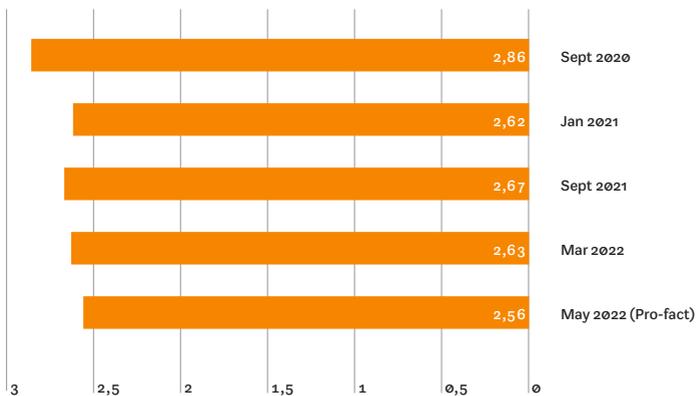
Graph 3. Average results on scales of believing in COVID – 19 conspiracy theories averaged across ReSCpoC (Sep 2020-Mar 2022) and Pro-fact (April-May 2022) surveys
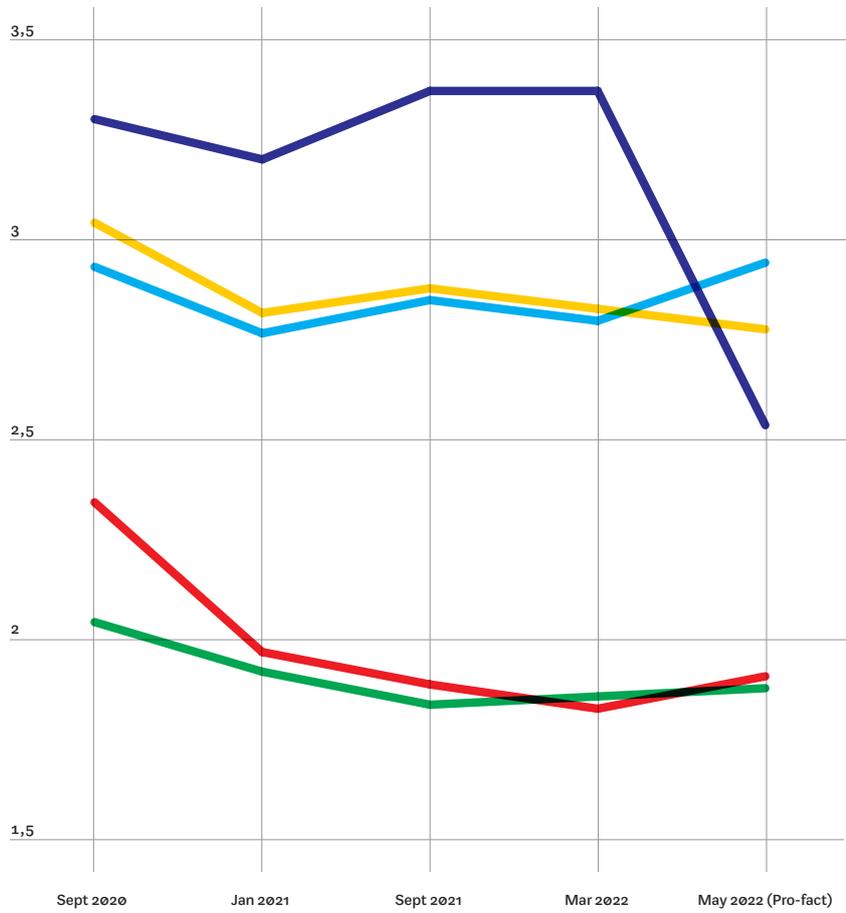
	ReSPoC
	The coronavirus did not originate from animals but was created by scientists in a laboratory.
	The coronavirus was released with the aim of destroying some of the world's economies.
	The coronavirus pandemic is the result of an agreement by large pharmaceutical companies to make money from vaccines.
	The story about the coronavirus was marketed in order to implant a chip into us with the "developed vaccine".
	The coronavirus spredas more rapidly in the presence of 5G networks.

	PRO-FACT
	Chinese scientists created the virus and deliberately released it from the lab because they already had a cure for it.
	The world elites created the virus with the aim of collapsing some of the world's economies in order to benefit financially from it.
	Corona was manufactured by the pharmaceutical lobby to get rich from selling vaccines.
	COVID-19 was artificially created in order to implant chips into people through vaccines to monitor and control behavior.
	5G technology is causing or spreading COVID-19, but this is being covered up so that the corporations working with this technology can continue to make a lot of money.

Graph 4. Level of endorsement for five similar COVID – 19 conspiracy theories.

In the following steps we have also compared several items of similar content to get a more detailed insight in the trends conspiracies' endorsement. The results are shown in the Graph 4.

These results show a trend to that of averaged results, except for one item regarding the creation of the coronavirus in the laboratory. Results of the Pro-fact survey are much lower, probably because of a much more precise statement about it which includes the information that Chinese experts have created for the purpose of biological warfare.

THE STRUCTURE OF BELIEFS IN COVID-19 CONSPIRACY THEORIES AND OTHER FORMS OF CONSPIRACISMS

In order to corroborate our previous insights about the monolithic structure of beliefs in COVID-19 conspiracy theories, we performed the factor analysis in the SPSS. Furthermore, to get insight into the wider structure of the selected conspiratorial beliefs, as possible correlates of COVID-19 conspiracy theories, we performed the same procedure for items about local and global conspiracy theories, conspiratorial mentality, beliefs in conspiracy theories related to populism, and nationalist populism, expressed in beliefs that evil forces are 'taking my country away'. The results for each set of items are presented in the following tables[59].

Regarding the *beliefs in COVID-19 conspiracy theories* we obtained a unidimensional structure with one general factor, which explains more than 61% of variance of the results (see Table 1). Such a structure clearly corroborates our previous supposition about the monolithic character of COVID-19 conspiracism.

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59   All factor analyses were performed in SPSS, by using PCA procedure for extraction and Promax procedure for oblique rotations (Kappa=4), where it was applicable. Oblique rotations were used instead of orthogonal because we deal with social and political beliefs which are usually interrelated and more contextualized then e.g., personality dispositions. All factor saturations lower than .30 were omitted as insignificant.

ITEMS	COVID-19 conspiracism
COVID-19 was deliberately produced and purposefully spread so that the world powers could benefit politically or economically from it.	.870
The world elites created the virus with the aim of collapsing some of the world's economies in order to benefit financially from it.	.881
The world elites created COVID-19 to decrease the number of people on the planet	.865
Corona was manufactured by the pharmaceutical lobby to get rich from selling vaccines.	.841
The Croatian authorities are lying according to the instructions of the UN and WHO and are working against the Croatian people in an unconstitutional manner so that we get sick and go bankrupt.	.824
COVID-19 is no more dangerous than the seasonal flu, but it is exaggerated in order to establish more effective population control and limit human freedoms and rights.	.726
Corona-measures are a deliberate preparation for changing the current way of life and an introduction to a digital fascist dictatorship.	.838
To protect their profits, agricultural companies deliberately hide scientific evidence that genetically modified crops lead to genetic contamination that can allow viruses like COVID-19 to multiply and spread.	.758
World's elites created COVID-19 to genetically modify human beings by means of the vaccines against the virus	.845
COVID-19 was artificially created in order to implant chips into humans through vaccines to monitor and control behavior.	.735
Chinese scientists created the coronavirus for biological warfare, but it accidentally escaped from the laboratory	.575
The pandemic was artificially produced to reduce migration and immigration of people from poorer and war-torn countries to richer Western countries.	.806
The US military created COVID-19 as a biological weapon and deliberately spread it in China to weaken it as a competitor.	.747
5G technology is causing or spreading COVID-19, but this is being covered up so that the corporations working with this technology can continue to make a lot of money.	.693
Statistics are manipulated in order to exaggerate the number of people who die from corona, when in fact they were already sick from another disease from which they eventually died.	.698
Chinese scientists created the virus and deliberately released it from the lab because they already had a cure for it.	.749
% of explained variance	61,2
KMO	.967
Bartlett's Test of Sphericity	18247.047; df=120; p<.001

Table 1. The structure of beliefs in COVID-19 conspiracy theories.

Items on *local conspiracy theories* investigated in our survey were already used in our previous studies (e.g. Blanuša, 2011; 2013; Blanuša, Kulenović, 2018). This includes a list of 13 chronologically ordered interpretations/beliefs of significant events and processes related to political issues in Croatia since the early 1990s, such as the references to the Homeland war, economic and democratic transition, relationship to internal and external political and economic actors and international organizations. As this structure of beliefs

varied in our previous studies, we tested it in this study through the exploratory procedure. The results are shown in Table 2 in the form of a pattern matrix obtained through the factor analysis procedure.

ITEMS	Conspiracies of internal and external enemies	Conspiracies of nationalist authorities
Presidents Tudjman and Milošević have arranged the division of Bosnia and Herzegowina in Karadjordjevo.		.760
In the course of aggression against Croatia, some great powers deliberately undermined its independence in order to preserve Yugoslavia.	.420	
Vukovar was sold in 1991 as part of a secret plan of territory swap.		.420
Transition to market economy and privatization were mostly the result of conspiracy between the Mob and the Government.		.820
The International Court in the Hague was founded with the intention of punishing those responsible for the disintegration of the Socialist Republic of Yugoslavia, abolish distinctions between the aggressor and the victims and conceal the real role of g	.700	
For more than a decade, the World Bank, IMF, and other international institutions have been economically and financially colonizing Croatia.	.511	
The intelligence underground in Croatia is networked with criminal groups and behind-the-scenes interests that are being pursued through illegal activities.		.674
The so-called human rights activists who are recruited from yugonostalgic groups and collaborators of foreign secret services are the most dangerous enemies of Croatia.	.865	
Since the mid 90's, so called left and liberal parties have been deliberately destabilizing the country and endangering its independence.	.881	
The European Union is a conspiracy of big business the aim of which is to destroy national states.	.672	
Far from the public eye and, contrary to the desire of its citizens, Croatia is attempting to join a new Balkan federation through regional integrations.	.772	
Croatia was robbed in an organized manner by the so-called great Croats who keep "one hand on their heart and the other in our pocket".		.856
The most dangerous enemies of Croatia are the traitors who never wanted or loved it, but always worked against it.	.703	
Sums of squared loadings after rotation	4,433	3,445
KMO		.887
Bartlett's Test of Sphericity		6682.389; df=78; p<.001
Correlation between factors		.395

Table 2. The structure of beliefs in local conspiracy theories.

The analysis shows that we can explain 53,5% of variance with two meaningful factors. The first one can be explained as conceived conspiracies of internal and external enemies of Croatia, and their content reflects the mainstream political discourse developed in the 1990s, especially during and after the Homeland war. Most of these supposedly conspiratorial actors were explained in a similar way in the well-known rabid speech of the first Croatian president, Franjo Tuđman in 1997[60], about the "black, green and yellow devils". The second factor is in its content alternative to the first one, explaining conspiracies of nationalist authorities, and indicating the most obvious cases of the state capture[61] by such forces. Although these two forms of local conspiracisms are seemingly opposed, our results show they are moderately correlated (.395) in a sense that people who see inner and outer enemies of the state in many actors, can also be critical of those who hold the power presenting themselves as the only true rulers of the state.

Global conspiracy theories used in our survey were also already used in our previous studies (Blanuša, Kulenović, 2018) and comprise the list of the usual suspects, from pharmaceutical companies, corrupt scientists, Jews, Freemasons, and other secret groups, as well as the US government. Their supposed wrongdoings that can be found circulating in many countries of the world, especially in the alternative internet ecosystems, were articulated in 13 statements. We tested it in this research through the exploratory procedure. The results are shown in the Table 3.

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[60]   This speech is still publicly available at You Tube: https://www.youtube.com/watch?v=U5xMo8OrOvw&t=3s&ab_channel=HDZTRE%C5%A0NJEVKASJEVER. For the analysis of the speech see Blanuša (2014).

[61]   State capture is the concept developed by the World Bank in late 1990s to explain the issues of introducing the market economy and liberal democracy in post-communist states (Klima, 2020: 21). It can be defined as the way of affecting, subverting, and seizing relevant political parties, and through them also the main pillars of the political system by means of informal networks and informal politics (ibid.: XV). See more about the state capture in the Balkans in the special issue of the journal "Perspectives: Political Analysis and Commentary" from 2017, available at: https://ba.boell.org/sites/default/files/perspectives_-_09-2017_-_web.pdf

ITEMS	Global conspiracism
It is hidden from the public that vaccines are harmful to health.	.764
Large pharmaceutical companies deliberately spread diseases in order to boost the sales of their medical products.	.803
Genetically modified food (GMO) shortens human life through which the global elite seek to control population growth on Earth.	.821
Global warming is a hoax of corrupt scientists who want to continue to spend public money on their research.	.577
The white stripes in the sky that remain behind the plane are actually the chemicals used to perform experiments on humans.	.667
Everyone using their computer online is being secretly monitored and is under surveillance.	.627
Jews control most important world events.	.678
The Freemasons and the Illuminati have influenced government decisions in many countries for a long time.	.769
There is a secret organization in the world whose aim is to destroy nation states and impose a New World Order.	.842
George Soros spies on and undermines the states in which he works through the organizations that he funds.	.754
The 9/11 terrorist attacks on the WTC buildings in New York were secretly organized by members of the USA secret services.	.693
Contacts with extra-terrestrial beings are hidden from the public.	.534
Regardless of who is officially in charge of governments, media and corporations, there is a secret group of powerful people who control world events, such as wars and economic crises.	.789
% of explained variance	52.2
KMO	.956
Bartlett's Test of Sphericity	9537.531; df=78; p<.001

Table 3. The structure of beliefs in global conspiracy theories.

Similarly to the structure of beliefs in COVID-19 conspiracy theories, global conspiracy theories also exhibited unidimensional structure with one general factor, which explains more than 52% of variance of the results. These two forms of conspiracism also share some topics, such as vaccines, manipulation with GMO, detrimental role of pharmaceutical companies and scientists, hidden world elites and powerful groups, but also an attempt to connect them into an overarching frame of supposed order of today's global world.

In contrast to the previous three forms of conspiracism, which are comprised mostly of specific conspiracy theories related to global and local contexts, the following three sets of conspiratorial statements were developed with the purpose of measuring ideologically specific conspiracisms related to populism (Blanuša, Kulenović, 2018), and populist nationalism (Parker, Barreto, 2013), as well as the general tendency toward conspiratorial thinking that would be stripped of its temporal and geographical context,

and conceived as conspiratorial mentality (Bruder et al. 2013). As these conspiracisms historically precede the recent COVID-19 conspiracy theories, they are included in our survey to assess the broader embeddedness and potential relationships of COVID-19 conspiracy theories with them. Their structures are shown in the following three tables.

Relationship of COVID-19 conspiracism - especially in the form of the "plandemic language" - with populism and nationalism was already indicated in the content and discourse analysis of this project (Grbeša Zenzerović, Vučković, 2022), as well as in some previous studies in other countries and on the global scale (e.g. Bieber, 2020; Brubaker, 2021: Thiele, 2022). This is especially important because of a potentially successful populist appeal to mobilize protests against the public health measures (ibid.). To measure specific populists conspiracist beliefs we previously developed a set of four items (Blanuša, Kulenović 2018), with the intent to measure two seemingly contradictory populist inclinations: 1) an anti-elitist conspiracism, as well as the 2) support for the shadowy rule of elites that would not be under democratic checks and balances, which is an expression of affinity of populism to charismatic leadership and elitism, already observed in some previous studies (e.g., Hawkins et al. 2012; Akkerman et al. 2014). Our results clearly corroborate these suppositions.

ITEMS	Anti-elitist conspiracism	Support for shadow government
To prevent the chaos of the rule of the people, the elites should rule from the shadows.		.837
Democratic procedures are just a show for the people, real decisions are made secretly elsewhere.	.839	
Political scandals are showing us that whenever the elites' interests are endangered, they will abuse public institutions.	.891	
The government and the media should be in the hands of the few, who will decide what's best for the people.		.832
Sums of squared loadings after rotation	1.511	1.477
KMO		0.502
Bartlett's Test of Sphericity		775,455; df=6; p<.001
Correlation between factors		.091

Table 4. The structure of beliefs in populist conspiracy theories.

To estimate the level of nationalist populism among our participants we used the scale developed by Parker and Barreto (2013), which captures the level of beliefs that some secret evil forces are taking away their country and destroying their rights and liberties. The results of the factor analysis are shown in the next table.

ITEMS	Taking my country away
Croatia that we know, and love is slipping away, and changing too fast.	.763
There are forces in Croatian society that may be changing the country for the worse.	.545
Most people in Croatia don't realize how much our lives are controlled by plots hatched in secret places.	.782
The people who really run Croatia aren't even known to the voters.	.731
I often feel that the really important matters in Croatia are decided by people we never even hear about.	.750
No sooner do most foreign immigrants get here than they try to bring America down by refusing to abide by our laws.	.616
The true Croatian way if life is disappearing so fast that we may have to use force to save it.	.735
Regardless of what some people say, there are certain races in the world that just can't mix with real Croats.	.510
I am afraid there isn't going to be as much freedom in Croatia as time goes on.	.742
% of explained variance	48,0
KMO	.889
Bartlett's Test of Sphericity	4827.872; df=36; p<.001

Table 5. The structure of beliefs at the 'taking my country away' scale.

In this case we also obtained a unidimensional structure with one general factor, which explains more than 48% of variance of the results.

Finally, we tested the structure of wider conspiratorial tendency via the short version of the conspiratorial mentality scale (Bruder et al. 2013), as a measure of general conspiratorial disposition.

ITEMS	Conspiratorial mentality
I think that many very important things happen in the world, which the public is never informed about.	.805
I think that politicians usually do not tell us the true motives for their decisions.	.796
I think that government agencies closely monitor all citizens.	.833
I think that events which superficially seem to lack a connection are often the result of secret activities.	.853
I think that there are secret organizations that greatly influence political decisions.	.870
% of explained variance	69.17
KMO	0.830
Bartlett's Test of Sphericity	4107.701; df=10; p<.001

Table 6. The structure of conspiratorial mentality.

The results on this scale can also be explained by one factor, which explains more than 69% of the variance.

In the following step we calculated the factor scores of explained structures and used them in the analysis of the relationship among the selected forms of conspiracism.

THE RELATIONSHIP OF COVID-19 AND OTHER FORMS OF CONSPIRACISM

By using the factor scores we managed to get insight into more robust tendencies and relationships among selected forms of conspiracisms (bivariate correlations, i.e, the network analysis). The results are shown in the next graph. As in Graph 2, the stronger the correlation between the items, the darker, thicker and shorter the line between them.
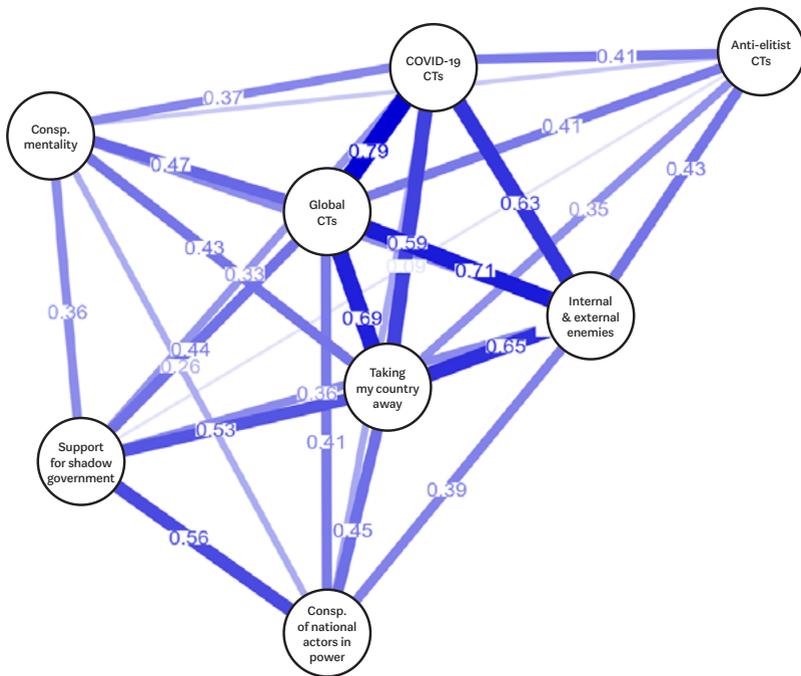
Graph 5. Network of bivariate correlations among COVID - 19 and other forms of conspiracism

The analysis clearly shows that all measures of conspiracism are positively correlated. Very high correlations are obtained between the four forms of conspiracism: beliefs in COVID-19 conspiracy theories, global conspiracy theories, existence of internal and external enemies of Croatia and that some secret evil forces are taking away our country. The highest correlation is obtained between COVID-19 and global conspiracy theories (.79). Since global conspiracies have already circulated in the public before the COVID-19 pandemics, this suggests that conspiracy theories about the pandemic were actually crafted on the global conspiracy theories and have used them as the more general discursive framework. Their shared content also supports this conclusion. Although we have used COVID-19 conspiracy theories developed in the regional context, their language and frame of reference seems to be the part of the same global conspiracism. Furthermore, such high relationships of both global and COVID-19 conspiracism with indicators of nationalist populism (taking my country away) and nationalism (internal and external enemies of the state), suggest that we are dealing here with the more general tendency that can be named conspiratorial mentality of sieged nation. In a nutshell, it can be interpreted that coronavirus - as an invisible enemy which makes even the air you breathe dangerous, together with the social anxieties and institutional burden it provoked on a global scale - also produces a new conspiratorial imagination, mostly among those citizens who had already been prone to such way of thinking. In that sense, the next important question is which characteristics make some Croatian citizens believe in COVID-19 conspiracy theories.

WHO BELIEVES IN COVID-19 CONSPIRACY THEORIES IN CROATIA?

To answer this question, we conducted four separate multiple regression analyses and accompanying ANOVAs, where it was applicable, by using believing in COVID-19 conspiracy theories (factor scores) as a criterion variable and the next groups of predictors for each of them[62]:

▶ Socio-demographics (age, education, size of settlement, size of household, household income)
▶ Relationship to science (scientific literacy, actively open-minded thinking (AOMT), trust in science, religiosity)[63]
▶ Media usage (ways of informing, trust in media, self-awareness of media strategies, critical thinking about media, perception of sources of fake news)
▶ Political characteristics (Left – Right self-identification, authoritarianism, populist attitudes, political alienation, collective (national) narcissism, political literacy, perception of WWII).

Our results are summarized in the following table.

62   All used predictors can be found in the enhanced database of survey results, which is the one of deliverables of the Pro-fact project.

63   For the explanation of the first three predictors see footnotes 1-3. Religiosity was the manifest variable that can be find in enhanced database of survey results, which is the one of deliverables of the Pro-fact project. It was used in this group of predictors because in the preliminary analysis was negatively correlated with other measures of the relationship to science.

PREDICTORS	R² adj.	Significant predictors [β]	SUMMARY
Socio-demographics	.077	younger adults (esp.25-29) [-.093];	SOCIALLY UNDERPRIVILEGED CITIZENS
		less educated (only elementary and vocational) [-.133];	
		who live in smaller settlements [-,076] and bigger households (7 or more persons) [.09];	
		with smaller household incomes (esp. Under 550€) [-.154].	
Relationship to science	.419	less scientifically literate [-.187];	VERY SKEPTICAL TO SCIENCE, LESS SCIENTIFICALLY LITERATE & CLOSE-MINDED
		highly religious [.047];	
		close-minded (AOMT) [-.136];	
		very distrustful of science [.474];	
Media usage	.213	slightly more inform themselves through social media and social networks [.072];	LESS MEDIA LITERATE
		slightly more than average critical on media [.055] but less aware of media strategies [-.165];	
		more trust to social media [.088] & to news and info from close people [,079] & less in traditional media [-.284];	
		perceive elites & media establishment as sources of fake news [.286] but not citizens, conspiracy theorists and social media [-.198]	
Political characteristics	.329	nationally narcissistic [.249];	LESS POLITICALLY LITERATE & PRONE TO THE RIGHT-WING POPULISM
		less politically literate [-.228];	
		more politically alienated [.105];	
		more express populist Manicheism [.178] and anti-elitism [.108];	
		think that Croats were victims not villains during WWII [.216]	

Table 7. Multiple regression analyses of four groups of predictors of believing in COVID-19 conspiracy theories.

As evident from Table 7, the best group of predictors are those measuring the relation to science. These predictors explain 41,9% of the variance of COVID-19 conspiratorial beliefs. More specifically, those who are very skeptical of science and at the same time more religious, close-minded and less scientifically literate are very prone to believe in COVID-19 conspiracy theories. Those who have opposite characteristics will be less prone to such a way of thinking. The same logic is applicable to the below-described results.

The second-best group of predictors are political characteristics, which explain 32,9% of the variance of COVID-19 conspiratorial beliefs. In that sense, citizens who are more narcissist about their nation, more prone to think that Croats were victims during the World War II, and prone to deny

the war crimes of the quisling quasi-state of Independent state of Croatia (NDH) during the same period, more prone to Manicheistic view of politics and populist anti-elitism, more alienated from politics and less politically literate, tend to believe in COVID-19 conspiracy theories more.

Third group of predictors which explains 21,3% of the variance of more conspiratorial beliefs is media usage. Those citizens who trust the traditional media (such as television, radio, press) less and who are more prone to inform themselves through social media and to trust them, as well as those who believe in information they get from relevant others (such as relatives and friends), who consider themselves as critical but less aware of media strategies, and who perceive elites and media establishment as sources of fake news, tend to believe in COVID−19 conspiracy theories more.

Finally, sociodemographic characteristics explain 7,7% of the variance of COVID−19 conspiratorial beliefs. These results show that citizens with smaller household incomes (especially under 550€ per month), who are less educated (especially those who finished only elementary and vocational school), younger (especially those 25 − 29 years old), as well as those who live in smaller settlements and bigger households (with 7 or more persons) exhibit more believes in COVID−19 conspiracy theories. Although this group of predictors is of smallest importance, it is clear that underprivileged citizens are more prone to COVID−19 conspiracy theories.

Taken together in a joint multivariate regression analysis, all these predictors explain 51,2% of the variance of COVID−19 conspiratorial beliefs.

CONCLUSION

All results we have shown in this report suggest that a significant portion of Croatian citizenry believe in COVID−19 conspiracy theories. Almost 50% of them believe in the manipulation of official numbers about the death-rate, 33,4% deny the danger of COVID-19 and more than 25% consider global-level actors as villains who have artificially produced the pandemic because of the profit and limitation of human rights and liberties. Such a way of "thinking" is monolithic in its structure, and highly related to other unwarranted forms of conspiracisms. It has only slightly decreased in the last three years and one of its profound characteristics is its embeddedness into the old split between religious and scientific approach of making sense of the world. COVID−19 is clearly on the side of religion and further nested in global conspiracism and secular religion of populist nationalism.

If we understand such widespread beliefs in conspiracy theories as the wrong answer to the real issues, not only of Croatia, but also of most of today's world, we can read our results as symptoms of what is wrong with our society and neo-liberal economic and liberal political order. We live in conditions of growing social inequalities which produce bigger and bigger differences and antagonisms between the haves and the have nots. Conspiracism is only one line of such cleavage which can fuel misunderstanding, mistrust, and growing sense of injustice, and become a powerful motivator for protests, riots, and more permanent political instability, especially if it is articulated in the form of the right-wing populist framework. Furthermore, skepticism towards science, perceived as a collaborator in sustaining the unjust order and part of the global conspiracy, is accompanied by the weak scientific, media and political literacy, which is notoriously neglected by responsible state and social institutions in this country. To be clear, we do not want to provide an abolition for scientists, politicians, government officials, media and other carriers of influence (e.g., church dignitaries). During the pandemic some of them have often communicated poorly in the public, mostly on behalf of their own, and at dispense of the public interest. All these public actors should consider themselves not as self-contained notables, but as a part of institutions which have lost a lot of their legitimacy during the pandemic. However, this is easy to say but very hard to accomplish.

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7

Behavioral Correlates of COVID-19 Conspiracy Theories

dr. NEBOJŠA BLANUŠA
Faculty of Political Science, University of Zagreb

dr. MIRJANA TONKOVIĆ
Faculty of Humanities and Social Sciences, University of Zagreb

dr. ANDREA VRANIĆ
Faculty of Humanities and Social Sciences, University of Zagreb

INTRODUCTION

As a part of Pro-Fact project activities aimed to research, educate, fact-check and debunk COVID-19 related disinformation narratives in Croatia on multiple levels by a multidisciplinary and intersectoral approach, this report focuses on the correlation between citizens' beliefs and their behavior. This research leans on previous phases of the project research activities, namely the social network analysis (Brautović, 2022a), the dynamic network analysis (Brautović, 2022b) and especially on the content and discourse analysis (Grbeša Zenzerović & Vučković, 2022), which we used as informational sources in the creation of measurement instruments for this survey. In that sense, after "online" research phases focused on the spread of COVID-19 disinformation eco-systems on the internet, we now focus on "offline" issues, such as how widely identified disinformation, especially conspiracy theories, are spread among Croatian citizens. With the aim to identify which groups of citizens are susceptible to disinformation and conspiracist beliefs related to COVID-19 pandemic, we conducted a national survey on a large sample of Croatian citizens. To get more insight into their possibly wider conspiracist/non-conspiracist frame of mind, we also assessed their proclivity to general conspiracism, beliefs in global conspiracy theories and beliefs in local (Croatian) conspiracy theories.

Furthermore, as reasons for opposing public health measures and ways of coping with pandemics can be related to COVID-19 conspiracism (e.g. Soveri et al. 2021; Farias & Pilati, 2021), and considering the fact that these issues can help public authorities to better organize future public campaigns, we explored relationships of conspiracist beliefs with behaviors related to coping with the pandemic, e.g. adherence to the preventive measures, vaccination and potential protest behavior in the future should preventive measures be reintroduced. This report gives an overview of this part of the survey results.

It focuses on following behavioral correlates of COVID-19 conspiracy theories:
▸ vaccination rate
▸ intent to vaccinate in the future should further vaccination be recommended
▸ attitude regarding the justification of preventive measures introduced in Croatia
▸ difficulty of coping with the preventive measures
▸ willingness to take different actions should preventive measures be reintroduced

The set of these potentially differential variables was drawn from the vast body of literature and pertains to various characteristics, skills and abilities related to worldviews and societal participation, such as scientific, media and political literacy, socio-demographics, proclivity towards other conspiracy theories, religiosity etc. Additionally, the differences between two groups of participants have been investigated – those who have received at least one dose of vaccine and those who have not been vaccinated at all. These analyses enabled us to compare the profile of citizens with different levels of proclivity towards belief in conspiracy theories with those who refused the vaccine against COVID-19.

METHODOLOGY

Data collection for this study was conducted online by Ipsos Croatia, from April 29th to May 17th, 2022, on the sample of 1401 adults, aged from 18 to 64. The sample was a national probabilistic sample, representative for the Internet users, double stratified by region (6) and size of settlement (4), with additional quotas for age (4) and level of education (3).

Out of 1401 participants, 717 (51.2%) were women. Average age was M = 42.6 (SD = 13.05). In terms of education 2.7% have finished elementary school, 71.3% have finished high school and 25.8% had a BA or higher degree. Regarding the size of their residence, 34.4% of our participants came from settlements with up to 2000 residents, 16.8% came from settlements with 2001 to 10000 residents, 21.1% from settlements with 10001 to 80000 residents and 27.8% from settlements with over 80000 residents.

Aiming to illustrate the relationships between believing in COVID-19 conspiracies and pandemic-related behaviors (e.g., vaccination, coping with the protective measures, etc.) the sample was divided in three larger groups. The groups were formed based on the average agreement, i.e. inclination, towards 16 conspiracy theories related to COVID-19, which we have investigated within this project. Two "extreme" groups consisted of 20% participants with the least, and 20% of participants with the most inclination towards conspiracy theories, i.e. the non-conspiracists and the conspiracists, respectively. The remaining participants have formed the third group ("others"). In the graphs below, we will illustrate the behavioral correlates of believing in the conspiracies related to the origin and the world-wide course of the COVID-19 pandemic using this threefold categorization of the sample. We also calculated the correlation coefficients between endorsing COVID-19 conspiracies as a continuous variable and variables of interest or, in one case, a chi-square test to test the differences between the above described three groups of participants.
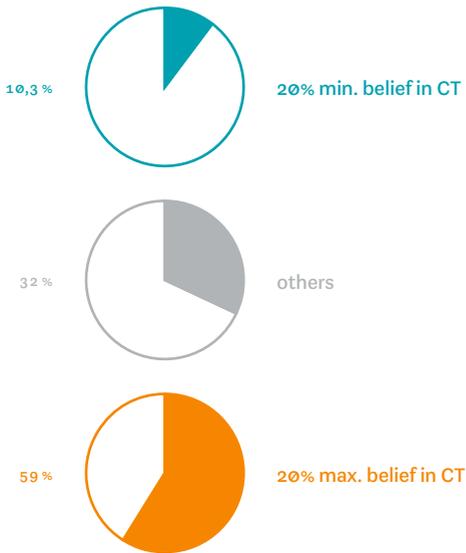
Graph 1. Percentage of non-vaccinated participants in three groups with different inclination towards COVID-19 conspiracies

VACCINATION RATE

Vaccination rate differs significantly (x^2=157; df=2; p<.01) between the above described three groups of participants.

       The percentage of unvaccinated participants (i.e., those which have not received any dose of vaccine) is lowest among the non-conspiracists; i.e., 10.3% of participants in the low CT group has not been vaccinated in comparison to the 59% of unvaccinated among those with high proclivity towards CT. There are around 32% of unvaccinated participants in the group not pertaining to either of the extremes (see Graph 1).

INTENT TO VACCINATE IF RECOMMENDED IN THE FUTURE

Participants were asked about their intent to vaccinate if recommended in the future. The responses were given on a 1-5 point Likert-type scale (certainly not, probably not, don't know, probably yes, certainly yes). Pearson's correlation coefficient between the intent to get vaccinated and believing in COVID-19 conspiracies was r=-.58; p<.01 indicating that those who are more inclined towards conspiracies have lower intent to get vaccinated in the future.

12,5%
75,5%
12,0%

20% min. belief in CT

45,1%
37,8%
17,1%

others

81%
11%
8%

20% max. belief in CT
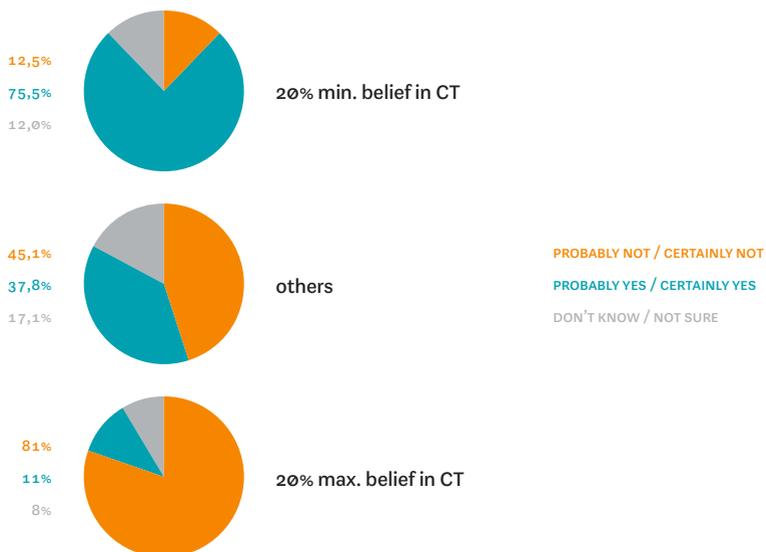
Graph 2. Percentage of participants with different inclination towards future vaccination in three groups with different inclination towards COVID-19 conspiracies

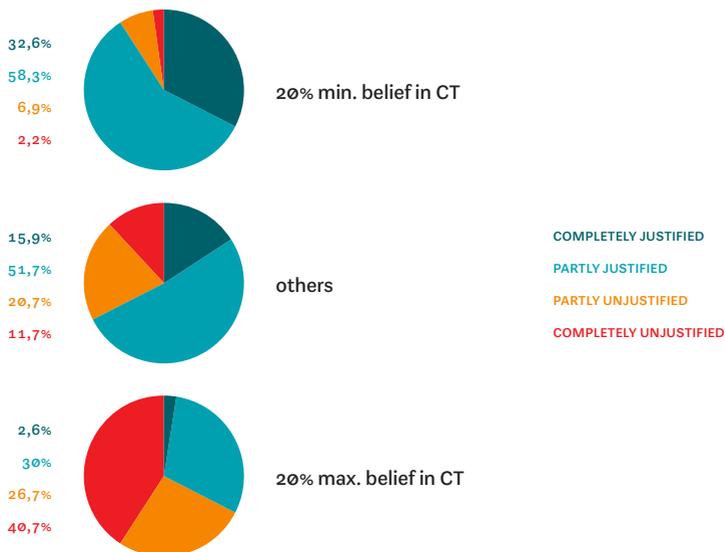As illustrated in Graph 2, the intent to get vaccinated in the future is much higher in non-conspiracists (75.5%) as opposed to conspiracists (11%). Participants on neither end of the extreme, i.e., 60% of the sample, is ambivalent regarding their future vaccination intents: 37.8% of these participants are inclined towards further vaccination, further 45.1% hold the opposing view (probably not/certainly not) , while 17% of them are undecisive (Graph 2).

ATTITUDE REGARDING THE JUSTIFICATION OF PREVENTIVE MEASURES

Preventive measures introduced in Croatia during the course of the pandemic were partly or completely justified, according to over 90% of non-conspiracists (see Graph 3). Among the conspiracists only 32.6% find justification for the measures undertaken, 26.7% believe these measures have only partly been justified, while 40.7% finds them completely unjustified. Among the middle, non-extreme group, 67.6% of participants find justification for the introduced measures, 20.7% finds them partly unjustified, and the final 11.7% holds the measures completely unjustified. Pearson's correlation coefficient between the attitude regarding the justification of preventive measures and believing in COVID-19 conspiracies was $r =.48$; $p <.01$ indicating that higher endorsement of COVID-19 conspiracies is related to more negative attitude toward justification of protective measures.

32,6%
58,3%
6,9%
2,2%

20% min. belief in CT

15,9%
51,7%
20,7%
11,7%

others

COMPLETELY JUSTIFIED
PARTLY JUSTIFIED
PARTLY UNJUSTIFIED
COMPLETELY UNJUSTIFIED

2,6%
30%
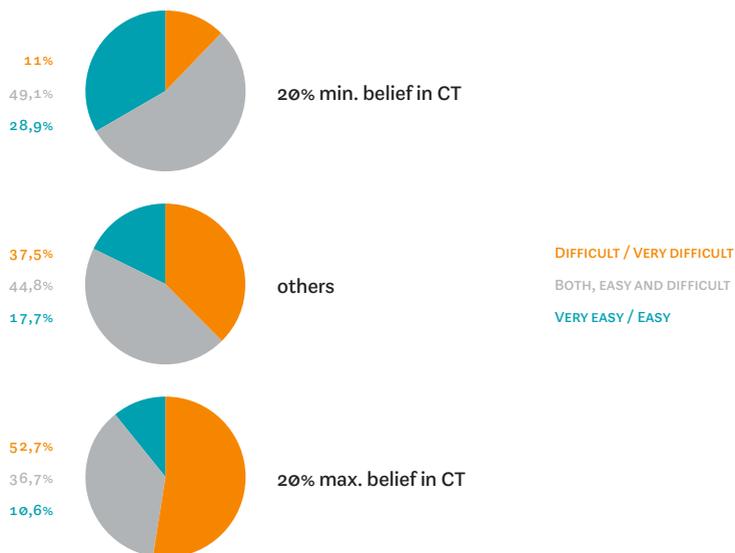26,7%
40,7%

20% max. belief in CT

Graph 3. Percentage of participants with different levels of justification of preventive measures in three groups with different inclination towards COVID-19 conspiracies

DIFFICULTY OF COPING WITH THE PREVENTIVE MEASURES

Coping under preventive measures (Graph 4), which have been introduced in Croatia at various times of the pandemic, went fairly easy among the non-conspiracists, i.e., 28.9%% of participants in the extreme group of those not inclined towards CT felt that it was *very easy* or *easy* to deal with the measures, and additional 49% did find the measures neither easy, nor difficult. Among them, 11% have found the measures difficult or very difficult to deal with. On the other hand, the majority (52.7%) of the participants inclined towards CT, i.e., the top 20% of the conspiracists in the sample, had found coping with the measures to have been difficult or very difficult. Among the mid-portion of the sample, i.e. those participants not pertaining to either of the extreme groups, 37.5% found the measures difficult or very difficult to cope with, as opposed to 17.7% who found the measures easy or very easy to deal with, and 44.8% found them to be both easy and difficult. Pearson's correlation coefficient between perceived difficulty of coping with the preventive measures and believing in COVID-19 conspiracies was rather low but statistically significant $r=.24$; $p<.01$, indicating that participants who believe in conspiracies experience more difficulties in coping with the measures introduced.

11%
49,1%
28,9%

20% min. belief in CT

37,5%
44,8%
17,7%

others

DIFFICULT / VERY DIFFICULT
BOTH, EASY AND DIFFICULT
VERY EASY / EASY

52,7%
36,7%
10,6%

20% max. belief in CT

Graph 4. Percentage of participants with different levels of perceived coping with the protective measures (difficult, easy or both) in three groups with different inclination towards COVID-19 conspiracies

WILLINGNESS TO TAKE DIFFERENT ACTIONS SHOULD PREVENTIVE MEASURES BE REINTRODUCED

Finally, participants were asked whether they would be willing to take different actions in the case that preventive measures were reintroduced, i.e., should the pandemic get into further and stronger wave/s. Conspiracists in the sample would be significantly more prone to undertake various actions or activities related to resistance towards the measures (Graph 5).

Create online political content
(e.g., video, post, blog, web-page, etc.)

Donate money to support a political party
or organization

Contact a politician, government, public
service or a local politician (via e-mail)

Participate in the working of a political
party, candidate or activitst organization

Participate in a political event in which property
can be damaged or physical confrontation with
oponents or police may occur

Participate in the blockade or occupation
of a public space or building

Draw or stick a message or grafitti
against the measures in public space

Join a social or a political group on
Facebook or any other social network

Participate in the Internet protest
againg the measures

Discuss the measures of the Internet

Share news, music, and video material via
social networks (Facebook, Twitter, Tiktok, etc.)
aimed at fighting the measures

Donate money to the organisations
fighting the measures

Volunteer in organisations fighting
the measures

Wear a badge, sticker or t-shirt with
a polical message

Participate in a strike

Participate in public protests and
demonstrations

Sign a petition (on the Internet)

Sign a petition (on site)

60   50   40   30   20   10   0

Graph 5. The percentage of participants willing to undertake different measures directed against COVID-19 preventive measures in three groups with different inclination towards COVID-19 conspiracies

The percentage of participants willing to undertake different measures aimed against COVID-19 preventive measures varies depending on the level of engagement required. The low-level involvement activities, such as Internet or on-site petition signing, would mobilize 58.6%, i.e., 56.4% of participants, respectively, within the group of those believing in the conspiracies the most. These activities would also mobilize most of the participants in the mid-group; 21-22% of participants which do not fall into any of the extreme groups would be willing to sign a petition against the reintroduction of measures. Next in line, for both of these groups is the Internet discussion of the measures. All three of these measures (Internet petition, on-site petition, Internet discussion) would mobilize the most of participants in all three groups; however, among non-conspiracists roughly 5-6% would get involved in these activities to protest against the measures, and this percentage is even lower when other proposed measures are considered. Indirectly, this data confirms the significance of Internet and social networks in the spreading of various (dis)information, probably via pools of like-minded people.
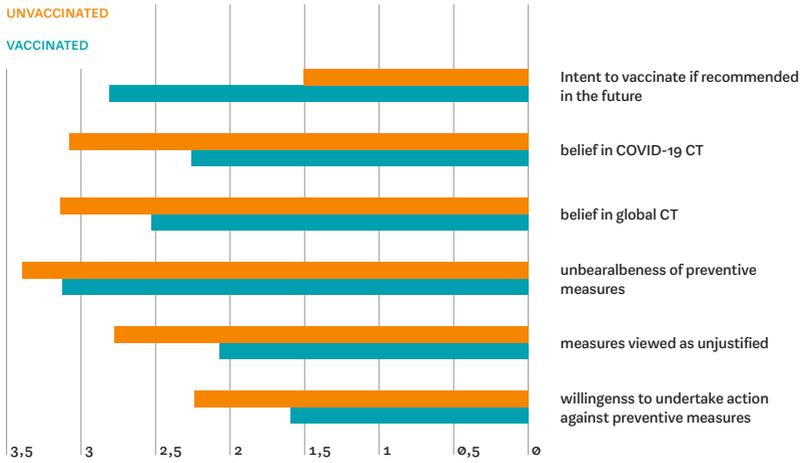
We found significant correlation between believing in COVID-19 CT and overall readiness to take actions against the reintroduction of measures (r=.54; p<.01).

VACCINATION AND COVID-19 CONSPIRACY THEORIES

In the participating sample, 33% participants were unvaccinated, 5.7% were vaccinated once, 35.3% twice, 23.7% three times and 2.3% did not want to answer. This percentage of unvaccinated people corresponds well with the vaccination data on adult population in Croatia. According to eVAC (see link above) and the report from the Croatian Institute for Public Health, 70.87% of adult population in Croatia has received at least one vaccine dose. A series of t-test was conducted to test the significance of differences between the groups of vaccinated (at least one dose received: N = 906) and unvaccinated participants (N = 463). The results of these analyses are shown in the paragraphs below.

The t-test shows that unvaccinated participants, similarly to those with high proclivity to COVID-19 CT, have significantly lower intent to vaccinate in the future, should such recommendations be given (t=25.4; df=1187; p<.001; d=1.54; Graph 6). By the same token, unvaccinated individuals show: a) higher levels of conspiracy mentality as opposed to their vaccinated counterparts (t=6.93; df=1367; p<.001; d=0.40; Graph 7), b) believe more in COVID-19 conspiracies (t=16.34; df=1367; p<.001; d=0.93; Graph 6), as well as, c) global, pandemic unrelated, conspiracies (t=13.42; df=1367; p<.001; d=0.77; Graph 6).

Intent to vaccinate if recommended in the future

belief in COVID-19 CT

belief in global CT

unbearalbeness of preventive measures

measures viewed as unjustified

willingenss to undertake action against preventive measures

3,5   3   2,5   2   1,5   1   0,5   0

Graph 6. Differences between the unvaccinated and vaccinated participants on various measures related to the coping with the pandemic

unvaccinated
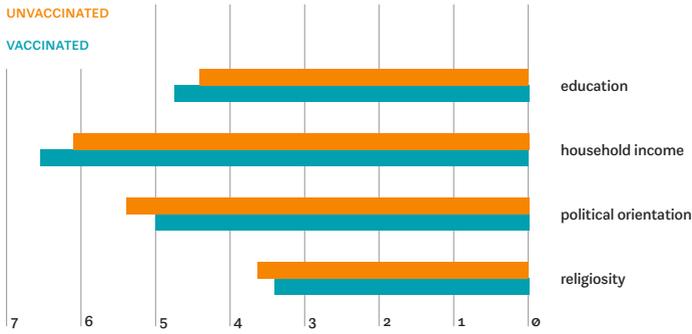
vaccinated

70   60   50   40   30   20   10   0
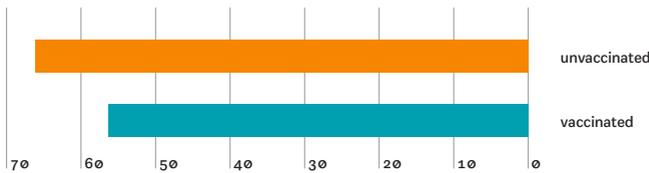
Graph 7. Average score of vaccinated and unvaccinated participants on the conspiracy mentality scale

Furthermore, these individuals find coping with the preventive measures more difficult (t=4.92; df=1367; p<.001; d=.28), consider the measures to be more unjustified (t=14.36; df=1367; p<.001; d=.82), and are more prone to participate in various actions to prevent the reintroduction of measures, should they be proposed (t=14.37; df=1367; p<.001; d=.82 (Graph 6).

VACCINATION AND SOCIO-DEMOGRAPHIC CHARACTERISTICS

Unvaccinated participants are of somewhat younger age (M=39.0, SD=12.44 vs. M=44.55, SD=12.97; t=7.60; df=1367; p<.001; d=.43), have achieved somewhat lower educational levels (t=4.42; df=1367; p<.001; d=.25), and their monthly household income is lower (t=2.77; df=1367; p<.001; d=.17) (Graph 8).
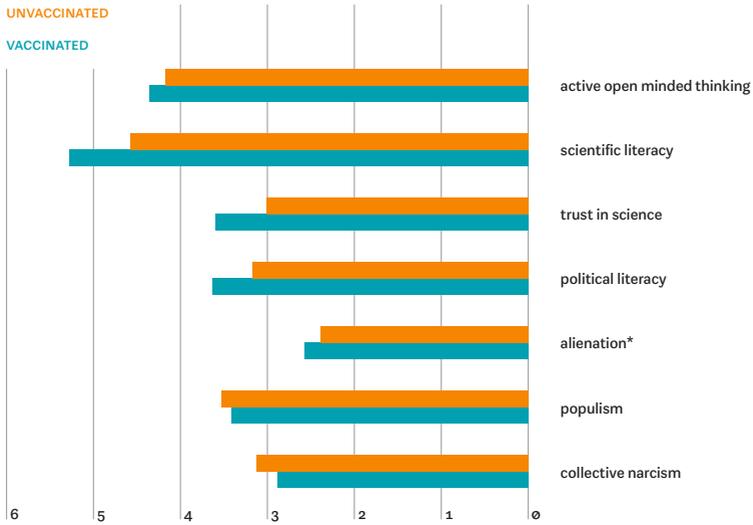
Graph 8. Differences between unvaccinated and vaccinated participants in different socio-demographic characteristics

Furthermore, in comparison to the vaccinated participants, the unvaccinated participants are slightly more religious ($t=3.31$; $df=1329$; $p<.001$; $d=0.19$), and are somewhat more right-oriented ($t=3.67$; $df=1367$; $p<.001$; $d=0.21$).

VACCINATION AND SKILLS RELATED TO WORLD-VIEWS AND SOCIETAL PARTICIPATION

Unvaccinated participants have less developed critical thinking skills in terms of lower active open-minded thinking ($t=3.95$; $df=1367$; $p<.001$; $d=0.23$), as well as scientific ($t=5.53$; $df=1367$; $p<.001$; $d=0.32$) and political literacy ($t=6.89$; $df=1367$; $p<.001$; $d=0.39$). Similarly, their trust in science is lower than trust in science of vaccinated individuals ($t=12.48$; $df=1367$; $p<.001$; $d=0.71$) (Graph 9). Furthermore, they have a higher tendency towards populism ($t=4.51$; $df=1367$; $p<.001$; $d=0.26$), and nationalism (i.e., collective narcissism) ($t=4.05$; $df=1367$; $p<.001$; $d=0.23$). Political alienation of unvaccinated participants is higher ($t=5.83$; $df=1367$; $p<.001$; $d=0.33$)[64].
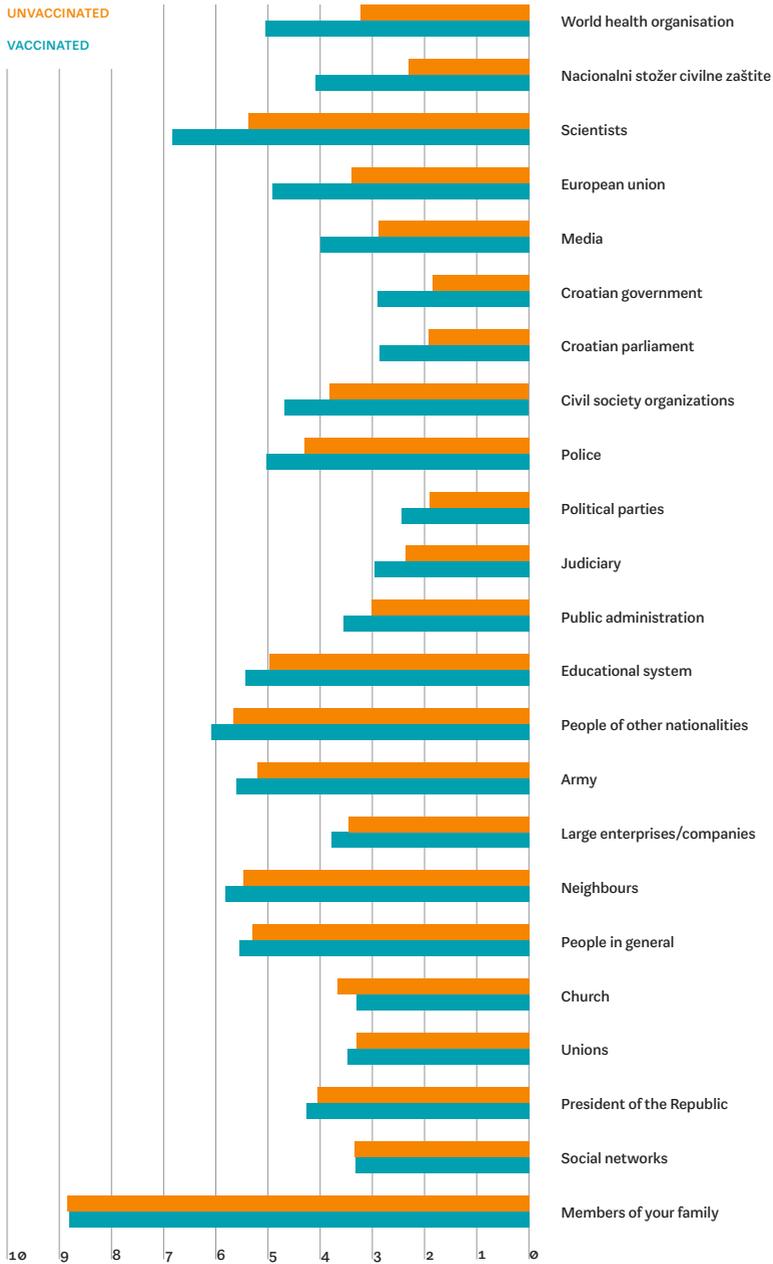
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64   Note: higher score in *Political alienation scale* signifies lower alienation

Graph 9. Differences between unvaccinated and vaccinated participants in various world-view measures and skills

VACCINATION AND TRUST IN INSTITUTIONS

Overall, the levels of trust in various institutions are very low among both, unvaccinated and vaccinated participants (Graph 10). On a scale from 0 (no trust) to 10 (complete trust) participants show the highest trust in their family members (M=8.84, SD=1.76) and there is no difference in trust in family members among the two groups. Also, no differences between two groups were found in the trust in Unions, the President of the Republic, and Social networks.

World health organisation
Nacionalni stožer civilne zaštite
Scientists
European union
Media
Croatian government
Croatian parliament
Civil society organizations
Police
Political parties
Judiciary
Public administration
Educational system
People of other nationalities
Army
Large enterprises/companies
Neighbours
People in general
Church
Unions
President of the Republic
Social networks
Members of your family

10 9 8 7 6 5 4 3 2 1 0

Graph 10. Differences between unvaccinated and vaccinated participants in their trust in institutions, organizations, and people

However, the two groups significantly differed in their trust in all other institutions, organizations or persons. The highest difference between the two groups is found in their trust in WHO (t=12.47; df=1357; p<.001; d=0.72), National Headquarters of Civil Protection (t=11.85; df=1359; p<.001; d=0.68), Scientists (t=10.71; df=1360; p<.001; d=0.61), the European Union (t=10.26; df=1355; p<.001; d=0.59), with vaccinated participants showing – although still low - significantly higher trust in these institutions then unvaccinated participants do. The most striking finding is the extremity of the overall distrust in different societal agents (governmental institutions, organization). Keeping in mind the ambiguity and indecisiveness of agents and institutions which have brought preventive recommendations, it seems likely they themselves might have been in the core of the disregard of these recommendation, low vaccination rate and thus have given rise to the CT.

CONCLUSION

Our results show that believing in COVID-19 CT is highly related to vaccination and vaccination intent in the future. It is also related to a more negative attitude toward justification of protective measures, more difficulties in coping with the preventive measures, and higher overall readiness to take actions against the reintroduction of measures. Finally, analysis of characteristics of unvaccinated participants showed that they highly resemble those who believed the most in COVID-19 CT. Additionally, belief in CT and (un)vaccination is related to institutional distrust. Therefore, in an attempt to raise the level of vaccination in the population, not only is the fight against disinformation needed, but it is also necessary to build, and thus regain, the trust in institutions. Simply put, in no case is it enough to buy the vaccines and expect people to get vaccinated.

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8

Who is afraid of fake news?
The belief in conspiracy theories and the potential to change the belief in fake news about COVID-19 — an experimental check

dr. NEBOJŠA BLANUŠA
Faculty of Political Science, University of Zagreb

dr. MIRJANA TONKOVIĆ
Faculty of Humanities and Social Sciences, University of Zagreb

dr. ANDREA VRANIĆ
Faculty of Humanities and Social Sciences, University of Zagreb

INTRODUCTION

Building on the findings of the previous research phases within the Pro-fact project, in the final phase of research activities we aimed to determine more precisely the thought processes involved in the emergence and transformation of belief in disinformation and conspiracy theories. In this sense, one of the best known theories of dual information processing, the heuristic-systematic model, seemed to us to be the most appropriate theoretical starting point. The heuristic-systematic model of persuasive information processing assumes that information that wants to convince us of something or change our opinion about an object or subject of thought can be processed in two ways (Chaiken and Ledgerwood, 2012). The first way is deliberate, thoughtful, careful, and requires an investment of cognitive effort and an evaluation of the arguments, while the second way is intuitive, quick, and relies on peripheral signs and heuristics, i.e., mental shortcuts, rather than on the quality of the arguments presented. Changes in attitude (its expression, intensity, not necessarily direction) that depend on the quality and direction of the arguments presented indicate that the change in attitude is based on a process of systematic, not intuitive, processing of information. This theoretical framework served as a frame of reference for reflecting on and drawing conclusions about the process of processing fake news, which we examined in more detail in this study.

The aim of this experimental part of the project was to test whether it is possible to influence belief in the information presented by guiding information processing and encouraging critical thinking about the content of fake news. We were also interested in whether there are differences in the possibilities and scope of this influence between groups that are differently inclined to believe in conspiracy theories. The results of the experiment show us at least one possible way of processing and consequently accepting fake news and whether there is a way to change the level of acceptance of fake news. Furthermore, the goal of the experiment was to investigate the emotional reactions to fake news and the possibility of influencing them by guiding the processing of the presented information.

We assume that highlighting information that might increase belief in the truth of claims presented in a short video increases belief in their plausibility, whereas highlighting information that suggests their falsity decreases belief in their plausibility, compared to the situation in which information processing is not directed in any direction after viewing. We expect that this influence will be greatest in the group of participants who only partially believe in conspiracy theories, while in the groups of participants who believe least and most in conspiracy theories, this influence will be less because

their (more extreme) opinions are more rooted in their models of understanding the social and political world. For the group that is partially inclined to conspiracy theories, we assume that influence is possible because their views are not extreme or polarized. At the same time, this group is the most interesting in practical terms because it represents people who can easily fall under the influence of fake news. Therefore, it is necessary to study how to prevent such an outcome.

METHOD

Participants

Participants in the experiment were selected based on the results of the survey portion of the study, i.e., their responses on the scale of belief in conspiracy theories about COVID-19 (Blanuša et al., 2022). By sampling, we aimed to obtain three groups of participants: 1) those whose score on the scale of belief in conspiracy theories about COVID-19 is in the 30% of highest scores, 2) those whose score is in the 30% of lowest scores, and 3) those whose score is in the 30% of scores that are in the middle of the range of all scores. Participants were recruited by the IPSOS agency, which sent links with an invitation to the survey to potential participants who were selected based on the data from the survey.

N=544 adult residents of the Republic of Croatia participated in the study (44.2% women, mean age M=43.9 (SD =12.7)). Of these, N=175 were in the group with the lowest scores on the scale of belief in conspiracy theories about COVID-19, and their scores on the scale of belief in conspiracy theories were in the range from the 1st to the 20th percentile in the total sample of participants who took part in the survey part of the research. In the group of those who believed in conspiracy theories about COVID-19, N=183 individuals were in the middle of the range identified in the survey, and their results ranged from the 38th to the 67th percentile. In the group of those who believed most in conspiracy theories about COVID-19, N=186 were in the middle of the range identified in the survey, and their results ranged from the 76th to the 100th percentile.

Those participants whose total time for solving the questionnaire was less than 5 minutes were excluded from the data analysis, as this was not enough to know the content of the video clip, which was an essential part of the research process and answering the following questions. There were 10 such participants in the group of those who least believe in conspiracy theories about COVID-19, 21 in the group that falls in the middle in terms of belief in conspiracy theories about COVID-19, and 23 in the group that most believes in conspiracy theories about COVID-19.

Ultimately, the results in this report are based on $N=490$ participants (44.6% women, mean age $M=44.6$ (SD =12.6))[65]. In the group of those who believe least in conspiracy theories about COVID-19, there were $N=165$ participants (38.9% women, mean age $M=46.4$; SD =13.0), in the group of those who believe on average $N=162$ (50.0% women, mean age $M=44.4$; SD =12.2), and in the group of those who believe most in conspiracy theories $N=163$ (45.0% women, mean age $M=43.1$; SD =12.5).

Research design and procedures

Participants from each of these three subgroups were randomly assigned to one of three experimental situations. The task for participants in all sub-groups was to watch a short video showing an interview with an individual who was introduced as a researcher and claimed to have discovered that there were chips in the vaccine against COVID-19[66]. Below you will find a description of three experimental situations:

► In the first experimental situation, after viewing the video footage, participants answered ten questions designed to highlight those data from the film that could potentially *increase belief* in the truth of the statements made. The questions required a "yes" or "no" response and were presented to participants as a test of their memory for details from the footage. An example of a question in this situation is following:

65   The mean age and proportion of women were calculated based on 475 participants for whom age and sex data were available.

66   This video footage is publicly available on the Bitchute web platform (https:// www.bitchute.com/video/IW5GtPU59Jzx/) and can be accessed without creating a separate account. The terms of use for the material published on said platform (https://support.bitchute.com/policy/terms/) also include the following: "BitChute does not claim any ownership rights to any Content posted to the Service." Under the chapter "Content Rights Granted by You," it states, "By making any Content available through the Service, you grant to BitChute a worldwide, royalty-free, transferable license with the right to sublicense, to use, copy, modify, create derivative works, display, perform, and distribute your Content in order to operate, provide, and promote the Service and Content to you and other users of the Service." In addition, the "Content Rights Granted by BitChute" section states, "Subject to your compliance with these Terms, BitChute grants you a limited, non-exclusive, non-transferable, non-sublicensable license to view, copy, display and perform the Content solely in connection with your permitted use of the Service and solely for personal and non-commercial purposes." In our case, the material is used for scientific research purposes, which implies a non-commercial use of this material. In addition, the author of the video material invites its sharing and further use. For the implementation of the experiment designed in this way, the positive opinion of the Ethics Committee of the Faculty of Political Sciences of the University of Zagreb was obtained.

"Did you notice that a researcher showed microscope images to medical professionals?" or "Did you notice that a professional researcher was qualified to recognize integrated circuits?". The goal of answering these questions was not to test the memory, but to highlight some of the information presented in the film.

▸ In the second experimental situation, immediately after watching the film, participants answered ten questions aimed at highlighting those data from the movie that clearly indicated the unreliability of the claims made, assuming that such a presentation of the movie content should *reduce belief* in their truthfulness. The form and presented purpose of these questions were the same as in the first experimental situation, but they differed in content. An example of a question in this situation is following: "Did you notice that the researcher in the program is not a doctor?" or "Did you notice that the doctors he asked what was in the pictures did not know the answer, but that was enough for him?".

▸ The third experimental situation was a control situation. After watching the film, the participants did not answer the guiding questions but immediately continued with the rest of the questionnaire.

After watching the video clip and answering questions about the film (in the two described situations), participants rated the credibility of the film and the arguments presented in it. At the end of the questionnaire, they were told the purpose of the study and that the video they had seen contained unverified information with no scientific basis.

Measuring instruments

▸ **The intention to get vaccinated.** After watching the film, participants first answered a question about their intention to get vaccinated in the future. The question was, *"Do you intend to get vaccinated against COVID-19 in the future if recommended?"* and responses were given on a scale of 1 (definitely not) to 5 (definitely).

▸ **Belief in the content of the video.** Participants answered two questions about the credibility of the video presented (*"To what extent do you believe in the content of this video?"*, *"To what extent do you believe that the information presented in the video is true or false?"*) on a scale of 1 to 7, with a higher number indicating a higher level of belief in the truthfulness of the information presented. The correlation of responses on

these scales is very high and is r=.94; *p* <.01, so on their basis an average score was formed that reflects the degree of belief in the truthfulness of the content of the video clip.

▶ **Emotions.** Participants rated the extent to which the video clip shown elicited the following reactions in them: fear, anger, concern, disgust, confusion, surprise, pleasure, and ridicule. Ratings were made on a scale of 1 (not at all) to 7 (extremely). The order of emotional responses for which participants made their ratings was random.

▶ **Researcher credibility.** Participants rated the credibility of the researcher who presented the results of his experiments in the featured video clip by answering four questions about his impartiality, honesty, persuasiveness of reasoning, and credibility. The answers were given on a 7-point scale. These responses were found to be highly interrelated (correlations of *r*=.60; *p* <.01 to *r*=.91; *p* <.01), so an average score reflecting the research-er's credibility assessment was formed based on these four questions. The reliability of the scale is α=.92.

▶ **Credibility of the journalist.** Participants rated the credibility of the journalist interviewing the researcher in the featured video clip by an-swering three questions about his or her impartiality, honesty, and credibility on a 7-point scale. These responses were found to be highly interrelated (correlations of *r*=.76; *p* <.01 to *r*=.88; *p* <.01) and based on them an average score was formed reflecting the assessment of the journalist's credibility. The reliability of the scale is α=.93.

▶ **Method and form of informing and reporting on COVID-19.** We also asked participants how much they trust sources like this video and if they would share this video on social media. In addition, we asked them several questions that we did not expect to be influenced by the experimental manipulation of highlighting different types of information, but would depend primarily on their belief in conspiracy theories about COVID-19. These questions related to whether they had encountered this type of content on social networks in the past year and who bene-fited most from the spread of such messages and who caused the most harm.
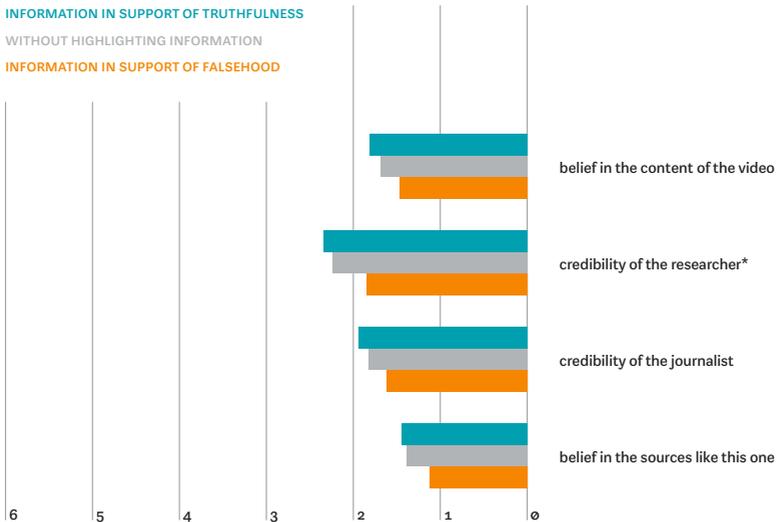
RESULTS

We analyzed the results separately for each of the three groups of participants described, which differed according to their belief in conspiracy theories about COVID-19.

Participants least likely to believe in conspiracy theories about COVID-19

Of a total of 165 participants who least believed in conspiracy theories about COVID-19, N=52 of them were randomly assigned to a group that, after watching the video, answered questions that highlighted those elements that might reinforce belief in the video's content, *N*=56 were assigned to a control group, and *N*=57 were assigned to a group that answered questions that highlighted those elements that indicated the unreliability of the statements made.

These three groups differed statistically significantly in their ratings of the researcher's credibility (F=3.25; df=2/162; p <.05), with the group that received information aimed at reinforcing belief in the content of the film giving the highest ratings, the control group giving lower ratings, and the group that received information suggesting untruth giving the lowest ratings. It should be noted that the ratings in all three groups are extremely

INFORMATION IN SUPPORT OF TRUTHFULNESS
WITHOUT HIGHLIGHTING INFORMATION
INFORMATION IN SUPPORT OF FALSEHOOD

- belief in the content of the video
- credibility of the researcher*
- credibility of the journalist
- belief in the sources like this one
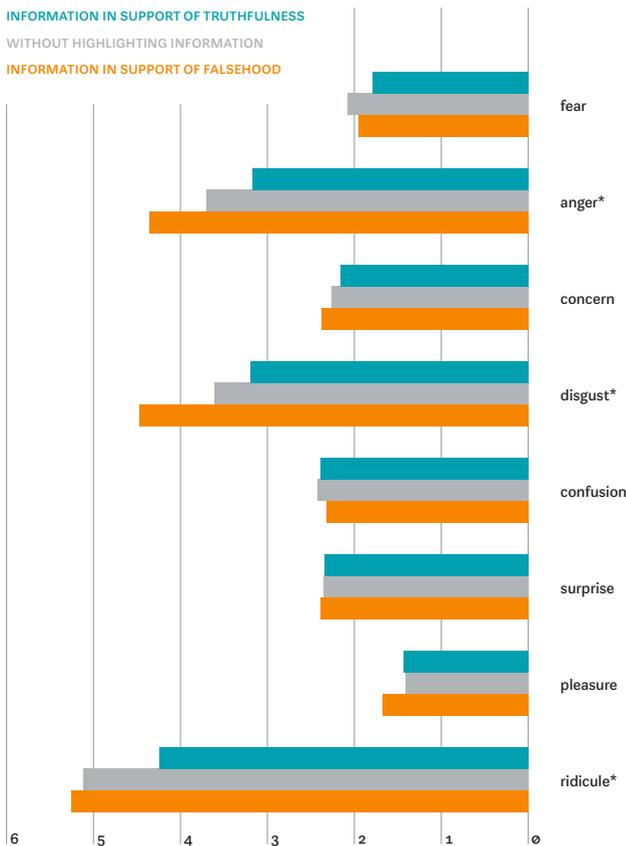
6   5   4   3   2   1   0

Figure 1. Average ratings of the items shown in the video as a function of the experimental situation for participants who do not believe in conspiracy theories about COVID-19 *(statistically significant differences are marked with an asterisk *)*

low, suggesting that the participants who least believe in conspiracy theories about COVID-19 generally rate the credibility of the researcher in the video as very low (Figure 1).

Participants in these three subgroups differed statistically significantly in the intensity of anger ($F=4.00$; $df=2/162$; $p<.05$), disgust ($F=4.96$; $df=2/162$; $p<.01$), and ridicule ($F=3.84$; $df=2/162$; $p<.05$) that the video elicited in them. Specifically, highlighting information that indicated the falsity of the video content resulted in higher perceived intensity of anger, disgust, and ridicule than in the control situation, whereas the experience of anger, disgust, and ridicule was lowest after highlighting information aimed at increasing belief in

Figure 2. Average ratings of the items shown in the video as a function of the experimental situation for participants who do not believe in conspiracy theories about COVID-19 *(statistically significant differences are marked with an asterisk *)*

the content (Figure 2). In addition, anger, disgust, and ridicule are the reactions for which participants generally give the highest rating of perceived intensity.

When asked if they would share this video on social media if given the opportunity, almost all participants responded that they would not. However, this number was (borderline) statistically significantly different depending on what information was highlighted after watching the video ($X2=5.92$; $df=2$; $p=.052$). A slightly higher percentage (7.7%) answered "yes" in the group presented with questions suggesting the video was true than in the control group (1.8%) or the group presented with information supporting the video was untrue (0%).

Differences between participants on all other measures, depending on what type of information was highlighted after viewing the video clip, were not statistically significant. In other words, their ratings of the intention to get vaccinated, belief in the content of the video, credibility of the journalist and other similar sources, and intensity of fear, anxiety, confusion, surprise, and satisfaction were not influenced by the type of information to which they were exposed.

Although the general ratings of the credibility of the presented material in this group of participants are low, as expected, the results show how they were influenced by the subsequently highlighted information in the sense that the ratings of some elements and some emotions were also influenced by them. This suggests that the participants in this group actively processed the available information.

Participants who are in the middle (neither susceptible nor not susceptible) in terms of their belief in conspiracy theories about COVID-19

Of a total of 162 participants who least believed in conspiracy theories about COVID-19, $N=55$ of them were randomly assigned to a group that, after watching the video, answered questions that highlighted elements that might reinforce belief in the content of the video, $N=50$ were assigned to a control group, and $N=57$ were assigned to a group that answered questions that highlighted elements that indicated the unreliability of the statements made.

These three groups differed statistically significantly in their assessment of the credibility of the researcher ($F=4.41$; $df=2/159$; $p<.05$) and the credibility of the journalist interviewing him ($F=3.24$; $df=2/159$; $p<.05$), with the group that received information aimed at increasing belief in the content of the film giving the highest ratings, the control group giving lower ratings, and the group that received information indicating untruthfulness giving the lowest ratings (Figure 3). The ratings in all three groups are relatively low, indicating a distrust of the researcher and journalist in the video, but they are significantly higher than the ratings of the group of participants least likely to

believe in conspiracy theories[67].Regarding reactions to the video, the analysis showed that there are statistically significant differences in experienced fear ($F=3.09$; $df=2/162$; $p<.05$), anger ($F=3.11$; $df=2/162$; $p<.05$), and concern ($F=4.09$; $df=2/162$; $p<.05$) among participants exposed to different types of information after watching the film. At the same time, it is noticeable that the highlighting of information indicating the untruthfulness of the statements made reduces the fear, anger, and anxiety compared to the control group and the group exposed to the highlighting of information supporting the truth, in which these emotions occur to the same extent (Figure 4). None of the emotions studied stood out in terms of intensity, with the exception of a strikingly low level of satisfaction.

When asked if they would share this video on social media if given the opportunity, most participants responded that they would not (80.2%) and this percentage was independent of the information highlighted after watching the video ($X2=3.38$; $df=2$; $p=.05$).
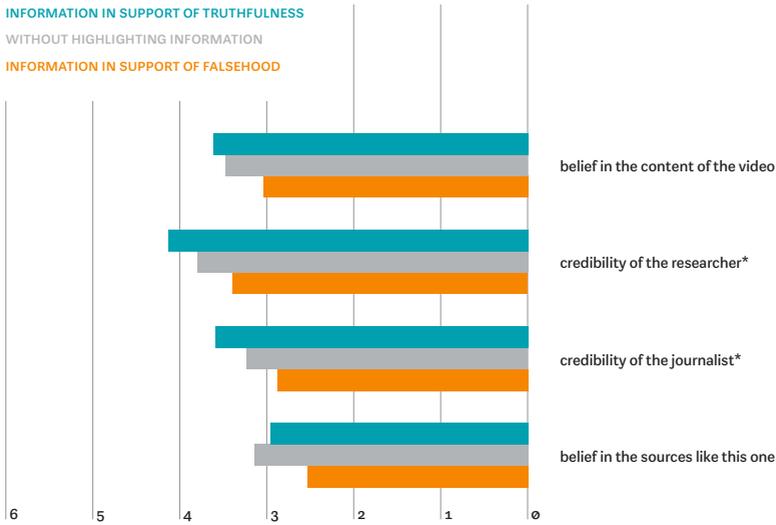
Differences between participants on all other measures, depending on what type of information was highlighted after viewing the video clip, were not statistically significant. In other words, their ratings of the intention to get vaccinated, belief in the content of the video and other similar sources, and intensity of anger, concern, disgust, confusion, surprise, pleasure, and ridicule were not influenced by the type of information to which they were exposed.

As in the group of those least likely to believe in CT, the results in this group also show that participants are influenced by the type of information that stands out after watching the video, at least for some of the observed variables. This suggests that these participants also actively processed the available information. Furthermore, a striking difference from those least likely to believe in CT is the effect that the subsequently highlighted information had on the emotions experienced. In this group, the information supporting the untruthfulness of the video decreased feelings of fear, anger, and anxiety, while in the group of those who least believed in CT, it increased feelings of anger and disgust. This reverse direction of the effect of this information on anger is probably due to the fact that among those who do not believe in CT, anger occurs in response to those who produce and disseminate

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67   The differences in all of the above variables between the three groups of participants who have different levels of belief in conspiracy theories about COVID-19 are statistically significant, in the direction that those who believe the least in conspiracy theories have the least confidence in the video ($F=159$; $df=2/487$; $p<.01$), researcher ($F=151$; $df=2/485$; $p<.01$), journalist ($F=148$; $df=2/485$; $p<.01$), and similar sources ($F=174$; $df=2/484$; $p<.01$) show the most trust, while those who believe the most in CT show the most trust, while those who believe in CT in the middle have a medium level of trust.

belief in the content of the video

credibility of the researcher*

credibility of the journalist*

belief in the sources like this one

6 5 4 3 2 1 ∅

Figure 3. Average ratings of items shown in the video as a function of experimental situation for participants with medium belief in conspiracy theories about COVID-19 *(statistically significant differences are marked with an asterisk *)*

such materials, while among those who believe in CT to a less extreme and more undecided degree, anger occurs in response to the possibility that the statements made are true. Therefore, it is possible to reduce this emotion in them with information that supports their untruthfulness.

Participants most likely to believe in conspiracy theories about COVID-19

Of a total of 163 participants who most believed in conspiracy theories about COVID-19, *N*=54 of them were randomly assigned to a group that, after watching the video, answered questions that highlighted those elements that might reinforce belief in the video's content, *N*=55 were assigned to a control group, and *N*=54 were assigned to a group that answered questions that highlighted those elements that indicated the unreliability of the statements made.

The difference between participants according to the type of information emphasized after viewing the clip was not statistically significant on any of the observed measures, i.e., the different types of information did not affect the rating of the credibility of the video or the intensity of the emotions experienced (Figure 5 and Figure 6). It is noticeable that the ratings related to the content of the video, the researcher, the journalist and similar sources are higher than those of the previous groups. Besides,
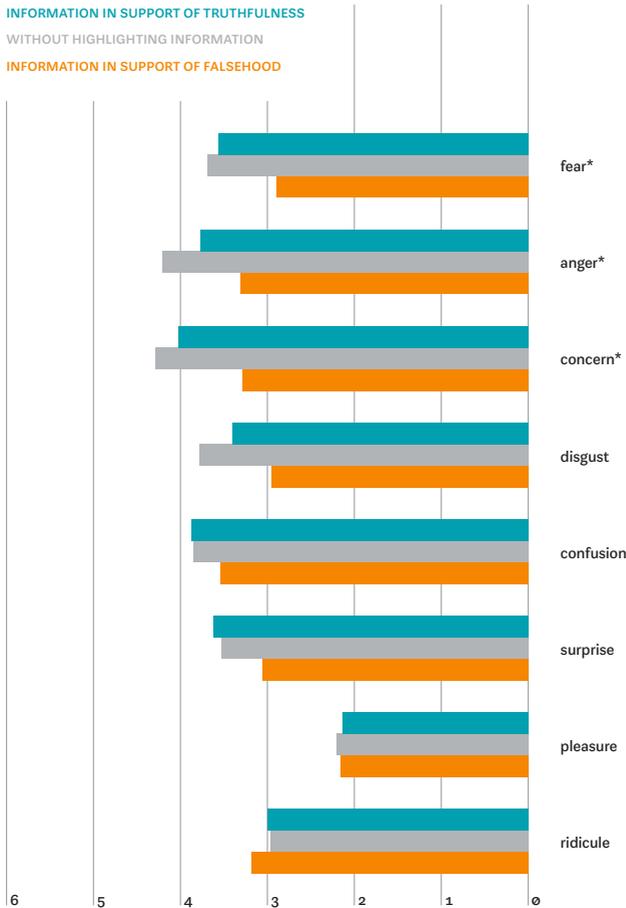
Figure 4. Average ratings of the intensity of reactions to the video as a function of experimental situation for participants with medium belief in conspiracy theories about COVID-19 *(statistically significant differences are marked with an asterisk *)*

for this group they are positive on average, that is, they reach values higher than the neutral point of the scale.

When asked if they would share this video on social media if given the opportunity, as many as half of the participants responded that they would (50.3%) and this percentage was independent of the information highlighted after watching the video ($X2=3.01$; *df*= 2; *p*=.05).

The results from this group of participants clearly demonstrate that their responses and ratings were not influenced by the type of information subsequently highlighted. Such results indicate a lack of active processing of the displayed content.
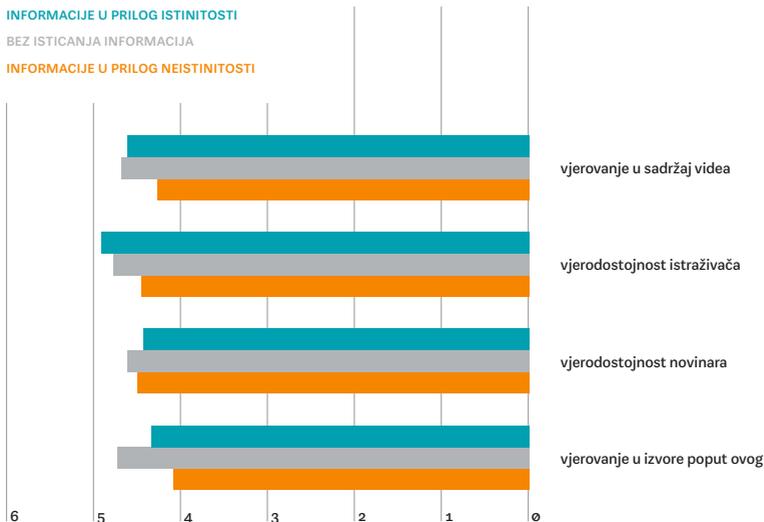
Slika 5. Prosječne procjene elemenata prikazanih u videu ovisno o eksperimentalnoj situaciji za sudionike koji najviše vjeruju u COVID-19 teorije zavjera *(* su označene statistički značajne razlike) (* su označene statistički značajne razlike)*

Comparison of emotions experienced by participants with different levels of belief in CT

When we talk about the evaluation of the credibility of the presented content, the differences between the groups according to the belief in conspiracy theories about COVID-19 are clear and expected. The lowest ratings are given by those who believe least in CT, followed by those who only partially believe in conspiracy theories, and the highest ratings are given by those who believe in them most. However, when we look at the ratings of the intensity of the emotions experienced, the situation is not so clear. Therefore, in the next step, we compared the participants who believe in CT to different degrees according to what kind of emotions the shown video evoked in them. We only analyzed the responses of participants from the control groups because previous analyzes have shown that the type of information presented after watching a video can influence how emotions are rated.
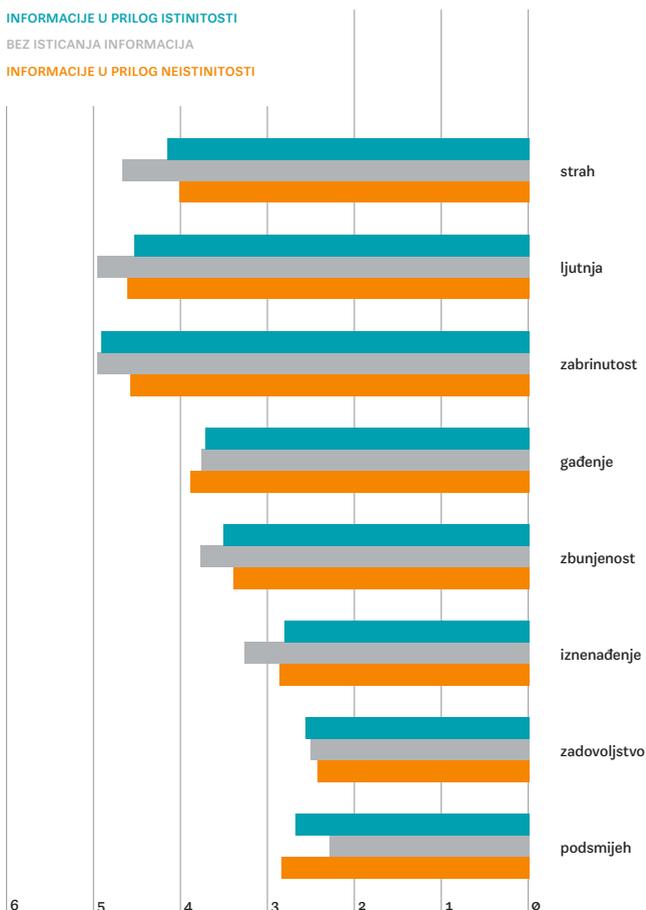
Therefore, this analysis was conducted with *N*=161 participants, of which *N*=56 belonged to the group that believed least in CT, *N*=50 belonged to the group that believed in the middle range in CT, and *N*=55 belonged to those who believed most in CT. They were not subjected to any experimental manipulation, but answered questions about the emotions they felt after watching the video without emphasizing the information one way or the other.

strah

ljutnja

zabrinutost

gađenje

zbunjenost

iznenađenje

zadovoljstvo

podsmijeh

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Slika 6. Prosječne procjene intenziteta reakcija na video ovisno o eksperimentalnoj situaciji za sudionike koji najviše vjeruju u COVID-19 teorije zavjera *(* su označene statistički značajne razlike)*

The analysis showed that these three groups differed statistically significantly for all emotions tested, except for the disgust (Figure 7).

After watching the video, participants who believe most in CT report the highest anxiety scores, the lowest scores are reported by those who are in the middle, and the lowest scores are reported by those who do not believe in CT (F=24.51; df=2/158; p<.ø1). The same is true for anger (F=4.85; df=2/158; p<.ø1). There are also differences in ratings of concern F=27.31; df=2/158; p<.ø1), confusion (F=9.6ø; df=2/158; p<.ø1), surprise (F=5.24; df=2/158; p<.ø1), and satisfaction (F=7.ø7; df=2/158; p<.ø1), with participants who
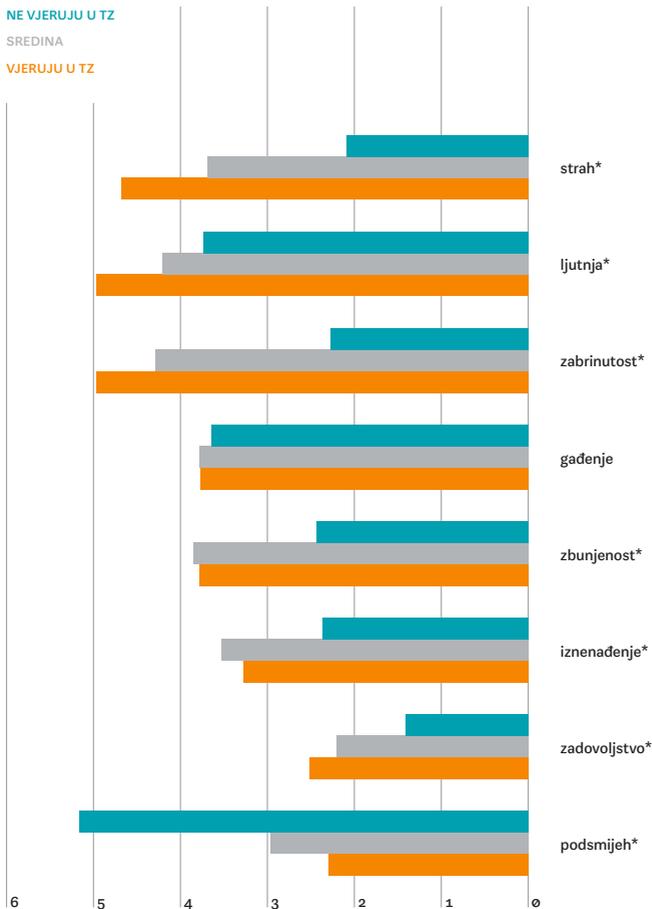
believed the least in CT exhibiting lower levels of intensity than those who believed the most and those who believed in the middle. It should be noted here that those in the middle who believed in CT rated the emotions they experienced as intense as those who believed in CT, i.e., they experienced an equal amount of apprehension, confusion, surprise, and (low) satisfaction. In the case of ridicule, we see an opposite trend in the results. The highest degree of ridicule is expressed by participants who are least interested in CT (F=41.50; df=2/158; $p<.01$).

Experiences with similar material and evaluation of benefits

We also asked participants how often they encountered this type of content on social media in the past year. We compared the responses of participants who believe in CT to varying degrees and found that on a scale of 1 (never) to 5 (very often), participants from the group that believes most in CT give the highest average responses, as expected (M=3.25; SD=1.07), while participants from the group that believes least in TC (M=2.81; SD=1.02) and participants from the middle group (M=2.83; SD=1.03) on average give lower responses (F=9.18; df=2/485; p<.01).

All participants were included in this analysis, regardless of the experimental situation, because responses were not to be influenced by processing information that we attempted to manipulate experimentally.

In the same way, we compared the responses of participants who believed to varying degrees in CT to the question of who they thought benefited most and least from the spread of such messages.

Of the participants who least believe in CT, 80.6% think that conspiracy theorists benefit most from such news and that citizens are harmed the most (86.1%). Those who believe most in CT believe that citizens benefit most from the spread of such news (33.5%), followed by conspiracy theorists (24.2%) and journalists and editors (12.4%). According to them, pharmaceutical companies and corporations suffer the most damage (60.9%), followed by citizens (26.7%). Participants who believe in CT in the middle believe that conspiracy theorists (46.0%), followed by journalists and editors (17.4%) and social networks (11.8%) benefit the most. According to them, citizens (62.1%) and pharmaceutical companies and corporations (29.2%) suffer the most harm.

CONCLUSION

Participants in this experiment watched a short video showing an interview with a person who claimed to have discovered that there were chips in the vaccine against COVID-19. Thus, the video shows alleged evidence of one of the more extreme conspiracy theories that emerged during the pandemic and that is believed by a small percentage of citizens in the Republic of Croatia (9.2% according to Blanuša et al., 2022). The entire content of the video is fake news Based on the conducted research, we can draw several conclusions:

▶ Participants who least believe in conspiracy theories about COVID-19 give the lowest ratings for credibility of the content presented, and those who most believe in conspiracy theories about COVID-19 give the most positive ratings for credibility of the content.

- ▶ Participants who least believed in CT experienced lower levels of fear, anger, worry, confusion, and surprise in response to the video shown. Participants with a medium belief in CT were as concerned, confused, and surprised as those who most believed in conspiracy theories, indicating their susceptibility to fake news.

- ▶ Highlighting information that indicates the falsity of statements presented by participants who least believe in CT decreases ratings of the credibility of some elements presented and increases feelings of anger, disgust, and ridicule toward the situation in which elements that speak to the truth are highlighted.

- ▶ Emphasizing information that indicates the untruthfulness of statements presented by participants who demonstrate an intermediate level of belief in CT also reduces ratings of the credibility of some items presented, but also reduces feelings of fear, anger, and anxiety, which is an important positive outcome of this type of intervention.

- ▶ Highlighting information indicating the falsity of statements made by participants most likely to believe in CT did not affect ratings of the movie content or emotions that arose in response to the movie.

- ▶ After all, half of the participants from the group that believes most in CT would share such video content on social media. This group also has the most experience with such content.

- ▶ Interventions that promote critical thinking about the content of fake news videos can have a positive impact on people who tend to believe in conspiracy theories, provided that this belief is not extreme.

- ▶ The research conducted also illustrates well real-life situations where we usually move in a circle of like-minded people and process information in a biased way, perceiving those that fit well with our already formed attitudes. Thus, long-term exposure to fake news, conspiracy theories, and biased information processing can lead to extreme attitudes and beliefs that, when they occur, are difficult to change through critical reflection and are accompanied by feelings of fear, anger, anxiety, and confusion.

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About
authors

Nebojša Blanuša

Nebojša Blanuša is a professor at the Faculty of Political Science, University of Zagreb. He teaches courses in Social and Political Psychology, Conspiracy Theories, Cultural Trauma and Politics of Memory. He is the coordinator of research activities of the project *Pro-fact: Research, education, fact-checking and debunking of disinformation narratives related to COVID-19 in Croatia,* funded by EDMO, as well as the principal investigator at the Croatian part of the CHANSE project: *REDACT - Researching Europe, Digitalisation, and Conspiracy Theories*. He has been involved in a number of international scientific collaborations in the area of investigating conspiratorial thinking and cultural trauma. His main research interests are in conspiratorial thinking, cultural trauma, politics of memory, nationalism and populism.

Mato Brautović

Mato Brautović is a professor at the Department of Mass Communication at the University of Dubrovnik. He is an author and co-author of many books, book chapters, and scientific papers in professional journals in the field of his expertise – media and war, journalism, internet history, online disinformation, digital methods, and social media. Professor Brautovic has a long and rich experience with scraping, cleaning and analyzing big data, going back to 2006, when he conducted his first social network analysis (SNA).

Ana
Brakus

Ana Brakus is the executive director of Faktograf — Association for the Informed Public, the publisher of Faktograf.hr. She worked as an author and managing editor at Faktograf.hr from 2018 to 2021. In the last decade, Brakus has collaborated with numerous media outlets in Croatia and the region. Since November 2022, she's a member of the Governance Body of the European Fact-Checking Standards Network (EFCSN). She graduated in political science from the Faculty of Political Science in Zagreb.

Marijana Grbeša Zenzerović

Marijana Grbeša Zenzerović is an associate professor at the Faculty of Political Science, University of Zagreb where she teaches courses in media, communication research methods, political marketing, and strategic communication in politics. She was a visiting professor at the Penn State University, Lehigh Valley. She was the Head of the School of Journalism and a Vice-Dean for International Relations at the Faculty of Political Science in Zagreb, a member of the negotiating team for Croatia's Accession to the EU for Chapter 25, Science and Research, and a representative of Croatia in the European Science Foundation. She has authored more than thirty books, chapters and scientific articles on media, political communication and populism. She is a researcher in the EU project *Pro-fact: Research, education, fact-check and debunk COVID-19 related disinformation narratives in Croatia* She has been working as a lecturer, media consultant and election campaign strategist in several SEE countries. She is the editor-in-chief of the peer-reviewed Media Studies journal. She is a recipient of several academic and professional grants and awards.

Mirjana Tonković

Mirjana Tonković is an associate professor at the Faculty of Humanities and Social Sciences, University of Zagreb, where she teaches courses in research methods in Psychology, Statistics and Psychology of language. She is the Deputy Head of the Doctoral program in Psychology at the Department of Psychology, Faculty of Humanities and Social Sciences, University of Zagreb. She has been involved in several projects founded by Croatian Science Foundation, dealing with post-corona social recovery in the Croatian general population, and dealing with language research and large databases of metaphors and psycholinguistic estimates of words building. Her main research interests are the relationship between language and thinking, effects of metaphorical framing on reasoning and decision making and determinants of pseudo-scientific beliefs.

Andrea Vranić

Andrea Vranić is an associate professor at the Department of Psychology, Faculty of Humanities and Social Sciences, University of Zagreb. She teaches courses in Cognitive Psychology and History of Psychology. She is the principal investigator of the project *Affective cognitive training: neural, cognitive and behavioral correlates*, funded by the Croatian Science Foundation. Also, she is the main coordinator of the CEEPUS network *Neuroshare: Sharing tools and Expertise in behavioral neuroscience*. She has been involved in a number of international scientific collaborations in the area of cognitive psychology and cognitive aging. Her main research interest lies in the area of human information processing, with the emphasis on the interplay between attention, memory, and reasoning.

Milica Vučković

Milica Vučković is a researcher and teaching assistant at the Faculty of Political Science, University of Zagreb. She earned her PhD in communication sciences from the Faculty of Social Sciences in Ljubljana where she specialized in online political communication. Before that, she graduated Political Science from the Central European University and Journalism from the Faculty of Political Sciences in Zagreb. She is currently teaching several courses: Media and the Public; Political Communication; and Propaganda and Disinformation. Her main research interests concern political communication on social media platforms. She also collaborates on several ongoing research projects. Before joining the Faculty of Political Science, Milica worked as a public relations specialist focusing on political election campaigns.

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About
the Project

Pro-fact:
Research, education, fact-check and debunk COVID-19 related disinformation narratives in Croatia

The Project is tackling disinformation related to COVID-19 on multiple levels by a multidisciplinary and intersectoral approach. Through research, awareness raising, and capacity-building methods, the project comprehensively approaches the social, political, and health problem of spreading disinformation campaigns related to COVID-19. Through its activities, it aims to effectively expose COVID-19 related disinformation campaigns in Croatia, strengthen the Croatian multidisciplinary team capacities for detecting and combating disinformation campaigns, and to increase media literacy competencies of Croatia journalists and the general public.

The coordinator of the project is Gong, while the partner organizations are: the Faculty of Political Science in Zagreb, The University of Dubrovnik, Faktograf.hr, and the Faculty of Electrical Engineering and Computing.

COVID-19 DISINFORMATION AND CONSPIRACY THEORIES IN CROATIA

Nebojša Blanuša
Mato Brautović
Ana Brakus
Marijana Grbeša Zenzerović
Mirjana Tonković
Milica Vučković
Andrea Vranić

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