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Limitations of Fact-Checking on Debunking COVID-19 Misinformation on Facebook: the Case of Faktograf.hr

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Abstract: This study examines the effectiveness of fact-checking to curb misinformation about COVID-19 spread through social media which has been considered the main channels for spreading misinformation in general (Newman et al., 2021). Using computational methods combined with content analysis, we analyzed Faktograf's fact-checks on COVID-19 (N=211) published between July 2020 and March 2021. Using a selected sample, we compared the debunked and misinformed versions of the same story based on the main elements of the communication process: source, channel, message, and recipient, to measure their estimated effectiveness in combating "infodemics". The main findings show that the practice of fact-checking websites to publish debunking content on their own websites and to use social media to disseminate debunking content is insufficient.

Keywords: COVID-19; Croatia; debunking; misinformation; fact-checking; infodemic; effectiveness.

INTRODUCTION

The COVID-19 pandemic created an environment of constant and unforeseeable information development, in which, people worldwide started to believe in the misinformation and disinformation about vaccines, the wearing of protective masks, or even the existence of a disease that could cause real damage to human health and life (Banerjee & Meena, 2021). As a result of this information environment, the World Health Organization (WHO) declared that the spread

of misinformation about COVID-19 represented a serious threat to combating the virus and called it an ‘infodemic’. The WHO (2021) defines an ‘infodemic’ as being:

too much information including false or misleading information in digital and physical environments during a disease outbreak [that]...causes confusion and risk-taking behaviors that can harm health [and] ...leads to mistrust in health authorities and undermines the public health response

The WHO warning occurred for a good reason. In the first three months of 2020, in the Middle East around 6 000 people were hospitalized, and at least 800 people may have died, as a result of misinformation about COVID-19 (Islam et al., 2021). The same study found that the spread of rumors, stigma, and conspiracy theories about COVID-19 also had consequences for society at large, and that Facebook, Twitter, and other online media, were the places where misinformation was mainly shared. According to van der Linden and Roozenbeek (2021, p. 150), potential solutions to the problem of [COVID-19] misinformation could be found using four approaches: algorithmic, corrective, legislative and psychological.

The algorithmic approach is already used by Google, Facebook and Twitter to ban unreliable sources, or to prevent misinformation being shown on the news feeds’ or search results’ pages. The corrective approach is based on the post-publication correction of misinformation by reliable and independent organizations. That kind of approach is known as fact-checking, and in the last five years there has been a huge proliferation of fact-checking organizations/websites (van der Linden & Roozenbeek, 2021). The legislative approach represents those new regulations (laws) that are making the truth as the norm. For example, France approved a law against the manipulation of information on 20th November, 2018 with the aim of preventing the spread of misinformation by foreign actors through social networks and media outlets especially during elections (French Government, 2021). The psychological approach deals with “the role of psychology, education, and the behavioral sciences in combating fake news” (van der Linden & Roozenbeek, 2021, p. 151). However, none of the four offers a complete solution to the problem.

This study examines the efficiency and effectiveness of the fact-checking approach using the practice of the Croatian fact-checking website Faktograf.hr, which was used as the source of misinformation for the analysis and an example of the practice of fact-checking because it is an outstanding example for Southeastern Europe. The website is also the only Croatian fact-checker that is a member of Facebook’s Third-Party Fact-Checking Program and the International Fact-Checking Network (Poynter Institute). As such, Faktograf.hr is required to follow

the International Fact-Checking Network's Code of Principles and is certified for conducting a standardized fact-checking methodology, transparency of their work, and compliance with ethical rules. Therefore, the analysis of Faktograf.hr's work can be used for a more general analysis of the fact-checking community and practice as a whole, and these results can help determine the limitations of such an approach.

We developed the following research questions with goal of assessing the efficiency of the fact-checking:

- RQ1: Which communication channels were used by the sources of COVID – 19 misinformation and fact checkers?
- RQ2: In what format was the COVID – 19 misinformation shared/published and how was this handled by fact checkers?
- RQ3: What was the reach of the misinformation and fact checks published via Facebook (likes, shares, comments and views)?
- RQ4: How long did it take to identify/expose misinformation and how do correction times affect the effectiveness of debunking misinformation?

FACT-CHECKING PRACTICE AND ORGANIZATIONS

Fact-checking became popular in recent decades as a result of the spread of political misinformation and the rapid growth of the internet. The first fact-checking attempt can be traced back to 1988, when it was used for coverage of the US presidential campaign (Young et al., 2018). After the proliferation of the process of fact-checking for special occasions (campaigns), independent fact-checking organizations were formed, particularly during the USA's intervention in Iraq and the American government's claims that there was a presence of weapons of mass destruction (Walter et al., 2020). The fact-checking organization Snopes.com was formed in 1995, with no link to journalism (Graves, 2016), and FactCheck.org in 2003, as a project of the Annenberg Public Policy Center of the University of Pennsylvania (FactCheck.org, 2021).

Walter et al. (2020, p. 351) argue that "fact-checking is the practice of systematically publishing assessments of the validity of claims made by public officials and institutions with an explicit attempt to identify whether a claim is factual". Usually, the fact-checking is carried out by journalistic, or independent non-journalistic organizations, but in the latter case the people involved are often either former journalists, or are connected to universities. This paper focuses on non-journalistic fact-checking organizations similar to Politifact, Snopes.com, and FactCheck.org, which are non-partisan, non-profit, and dedicated to reducing the amount of misinformation available to citizens (FactCheck.org, 2021).

There are two major models of fact-checking that are carried out by non-journalistic organizations: “fact-checks that rely only on written analysis to assess claims, and those that also deploy a graphical meter or ‘truth scale’” (Amazeen et al., 2015, p. 1). The first model provides an analysis of doubtful information, offering the correct information whilst the second model provides not only the analysis, but also an indicator of the degree of truth (Amazeen, 2012). Usually, that indicator is visual in nature and labels the fact-checks with categories: False, Mostly False, Uncheckable, Mostly True, and True (EUfactcheck.eu, 2021), in an oversimplified, metric way.

Uscinski and Butler (2013) castigate fact-checkers for their occasionally dubious fact-checking practices and naïve political epistemology. Starting from the perspective of the Social Sciences, they found that fact-checkers are failing in their selection of stories for correction, the causal relationship between facts, the prediction of the future outcomes, and the lack of explicit standards. The selection of stories for analysis can be subjective, because it is impossible to randomly sample and thus such a choice can be ideologically impartial. As Uscinski explains:

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).

Another problem were causal claims, which are hard to prove “because it is rarely clear which effects stem from which causes” (Uscinski & Butler, 2013, p. 168). Furthermore, it is impossible to check the facts of future events or outcomes, and fact-checkers can use any criteria without explaining why they have made that choice. Further, rating of the information as true or false is a philosophical error (Uscinski & Butler, 2013, p. 174). Amazeen (2015) evaluated Uscinski and Butler (2013) and argues the authors over-generalized and that there was a lack of empirical evidence to support their claims. Nevertheless, Amazeen (2015, p. 17) acknowledges the inadequate practices, but stresses that fact-checking plays a crucial role in democracy.

During the COVID-19 pandemic, some international organizations (e.g., WHO) and governments developed fact-checking websites in response to the “infodemic”. Their goal was to verify the accuracy of the facts about the pandemic and to point out dangerous misinformation (Naeem & Bhatti, 2020).

EFFECTIVE COMMUNICATION AND FACT-CHECKING

Studies on the efficiency of fact-checking show contradictory data. For example, a study by Kim Fridkin, Patrick J. Kenney and Amanda Wintersieck (2015) has shown that fact-checks, especially the negative ones, influence people's views on political information.

Fact-checks influence people's assessments of the accuracy, usefulness, and tone of negative political ads. The fact-checks also sway citizens' likelihood of accepting the claims made in the advertisements. Fact-checks challenging the truthfulness of the claims of the negative commercial are more powerful than fact-checks authenticating the assertions made in the negative advertisement. (Fridkin et al., 2015, p. 146).

On the other hand, Nyhan and Reifler (2010)—on the basis of empirical evidence—suggest that fact-checks commonly fail to reduce disinformation and may increase the misperceptions of the most ideologically committed participants.

However, there have also been studies that arrived at neutral findings on the effectiveness of fact-checking. Walter et al. (2020, p. 366) show that “fact-checking messages positively affect beliefs, irrespective of political ideology, preexisting positions, context (campaign vs. routine), and whether it refutes the entire false statement or just parts of a statement. In fact, not all fact-checking attempts are equally effective”. Walter et al. (2020, p. 367) also found that the influence of fact-checking on beliefs is weak, and that the process that have visual elements are less effective.

Similarly, Nyhan et al. (2019, p. 27) find that fact-checks can reduce misinformation, but not enough to influence respondents' attitudes toward their preferred candidate.

The effectiveness of fact-checking can be observed by the manner in which corrections (debunkings) of misinformation were communicated in response to the original misinformation. The basis for evaluating the effectiveness of fact-checking is found in Osgood-Schramm's circular communication model (McQuail & Windahl, 1993), which explains that the effectiveness of communication depends on the “behavior of the main actors in the communication process” (McQuail & Windahl, 1993, p. 19). Osgood-Schramm's model takes a source that encodes the message through various channels to the recipients, who then decode the message and send feedback to complete the communication process.

For this study, we used elements of the circular communication model (source, channel message, receiver and feedback) as a basis for comparative analysis of the effectiveness of fact-checking and original misinformation. It should be noted

that in this sense, the reach of fact-checking and misinformation can be viewed as a measure of receiver (audience) and feedback.

In the case of online misinformation, the senders are either or both various individuals and organizations that use social media and other online channels to disseminate their messages to a wider audience. The sources of debunking are, on the other hand, fact-checking websites, which by default are less persuasive compared to the sources of misinformation, which can be virtually anyone: from friends, family members, public figures, mainstream media, to alternative news sources and activist organizations. Similarly, messages can be written in various and richer combined formats such as text video, photograph, or blog. Some formats are better suited to the online environment and social media tends to algorithmically promote them more (video, photo) than other formats (text). Fact-checkers should use the same channels and formats to combat misinformation, but they rely mainly on text and usually publish debunkings on their websites and social media.

THE REACH OF FACT-CHECKS

Another problem with the efficiency of fact-checking is the reach of such campaigns. It is impossible to debunk all the misinformation as the creation of the kind of content that needs less resources than does the process of debunking (Kurtzleben, 2016). According to the Duke Reporters' Lab, there were 341 fact-checking sites in 60 countries, with the majority situated in Asia, North America and Europe, which implies the misinformation sources outnumber the fact-checkers (Stencel & Luther, 2021).

As Africa Check, Chequeado and Full Facts noticed a few years ago, fact-checking has limitations:

because current fact checkers don't have the reach to get the message through to all those it needs to reach. There is no realistic prospect of anyone funding the communications effort it would take to get that reach. Fact checkers are outspen by campaigns 100 to 1 or more at election times. (Africa Check, Chequeado and Full Facts, 2019).

The big-data firm Alto Data Analytics conducted a study on the efficiency of the fact-checkers in Germany, France, Spain, Italy and Poland in 2019. They found between 0.1% and 0.3% of the total number of retweets, replies, and mentions could be linked to fact-checking (de Carbonnel, 2019). Less than 1% of users close to populist and far-right parties created 10% of the political posts, but fact-checkers had limited reach in these closed communities (de Carbonnel, 2019).

For example, in Germany, only 2.2% of Twitter users engaged with content that was shared by six fact-checkers (de Carbonnel, 2019). In a previous study, Strazicic et al. (2021) found that 85.4% of the students surveyed never accessed the fact-checking sites to verify misinformation about COVID-19. Similarly, misinformation on Twitter is shared about 70% more often than true information, which takes six times longer to reach 1,500 people (Vosoughi et al., 2018).

FAKTOGRAF.HR AND FACT-CHECKERS IN SEE

Although Europe has a high number of fact-checking organizations, there is a limited number of organizations in Southeastern Europe (SEE) (Stencel & Luther, 2021). There are two that are based in Serbia (<http://www.istinomer.rs/> and <https://www.raskrinkavanje.rs/>) and in Bosnia and Herzegovina (<https://raskrinkavanje.ba/> and <http://istinomjer.ba/>). There is one fact-checking organization in North Macedonia (<https://www.vistinomer.mk>), Kosovo (<https://kallxo.com/krypometer/>), Montenegro (<https://www.raskrinkavanje.me/>), Slovenia (<https://razkrinkavanje.si/>) and Croatia (<https://faktograf.hr/>).

Most fact-checkers from SEE are part of the International Fact-Checking Network and the SEECheck Regional Network for Combating Disinformation, which is “working on promoting media accountability, improving media literacy and fighting disinformation, media manipulations and malign foreign media influence in the region of Southeast Europe” (SEE Check, 2020). They are funded by international foundations (Open Society, National Endowment for Democracy), foreign embassies (USA, EU), and tech companies (Google, Facebook).

Faktograf.hr is the only Croatian fact-checking website that is focused on correcting facts. It was founded in 2015 by GONG (a Croatian civil society organization that oversees elections) and the Croatian Journalists’ Association, and from April, 2019, has been an accredited partner in Facebook’s Third Party Fact Checking Program (Faktograf.hr, 2021). The founders of Faktograf.hr state they got the idea for launching a fact-checking website and then adapted it to Croatian conditions from the systems used by PolitiFact, FactCheck and Fact Checker The Washington Post (Faktograf.hr, 2021).

Croatia’s Faktograf.hr provides two types of fact-checking: statements by politicians and public office holders, and the accuracy of claims made in digital space. In relation to the first type (in Croatian: Ocjena točnosti), they evaluate the claims of politicians and political actors, whose accuracy can be measured by objective facts while, in the second type (in Croatian: Razotkriveno), they assess the accuracy of those claims that could be found in online media and on social networks (Faktograf.hr, 2021).

During the COVID-19 pandemic, Faktograf.hr established a special blog entitled “LIVE BLOG: Coronavirus misinformation” (<https://faktograf.hr/2021/08/31/live-blog-dezinformacije-o-koronavirusu-2/>), which was used for gathering and for gaining easier access to Faktograf.hr’s fact-checks on COVID-19. In the period between January 27th, 2020, and March 26th, 2021, they published 381 COVID-19’s fact-checks, which could be chronologically accessed on the blog.

METHODOLOGY

The paper is based on a mix of methods: computational methods for coding and retrieving data, and content analysis. The fact-checks (N=211) from Faktograf.hr that were published in the period between July 1, 2020, and March 31, 2021, were scraped using Data Miner software, and were then stored in the spreadsheet format that was used for later content analysis. The analysis covered the period of the second and third COVID-19 pandemic waves, including the summer of 2020, when the number of infected people in Croatia was low, but parliamentary elections were held (July 2020) and COVID-19 was the main topic in the election campaign. The beginning of the pandemic was omitted from the analysis because it took some time for fact checkers to adjust to the COVID-19 crisis and respond to the exponential increase in misinformation about virus. The selection criteria of the general sample for analysis was adopted from Naeem, et al. (2020). The units for the analysis were the fact-checks, original misinformation (posts) and print-screens that were used by Faktograf.hr to preserve original misinformation, and were included in the fact-check. In instances where Faktograf.hr’s fact-checks referred to several misinformation posts, the oldest that was still available at the time of the analysis was used. Only in instances where none of the posts were active did the analysis use the oldest archived misinformation. Fact-checks that referred to no-media content, for example, the misinformation that was shared in the form of flyers, or which contained more general debunking attempts that did not address specific online content, were excluded from the analysis. Fact-checks that referred to the same misinformation (duplicates) were also excluded.

The content analysis had 11 categories: (1) the publication date of the misinformation; (2) the publication date of the fact-check; (3) the headline; (4) the URL of the misinformation; (5) the URL of the fact-check; (6) the author of the fact-check; (7) the source (author) of the misinformation; (8) the medium or place that shared or published misinformation (if different to source); (9) the reach of misinformation on Facebook; (10) the reach of a fact-check on Facebook; and (11) the status of the misinformation. The source for Categories 1–6 were fact-checks and print-screens. Category 7 had 5 subcategories: (i) social media,

(ii) a person, (iii) alternative media, (iv) mainstream media, and (v) other. Subcategory 5 involved instances where the original misinformation was edited by shortening, subtitling, or similar, and the author of the misinformation was recorded as being the editor and not the original author. Category 8 represented the name of the medium/place. Categories 9 and 10, both on Facebook had 3 subcategories: (i) likes, (ii) comments, and (iii) shares. Although these subcategories represent engagement with Facebook content and capture only a portion of a post's overall reach, we consider them equal because it was not possible to obtain data on post views. For this category, the data were collected using the URL address of the misinformation and fact-checks and the software CrowdTangle, which Facebook developed that can be used for "...follow[ing], analyz[ing], and report[ing] on what's happening with public content on social media" (CrowdTangle, 2021). Category 11 represents the data that answers the question as to whether that misinformation is still available online, and has 2 subcategories: (i) yes and (ii) no. Because the data contained extreme outliers, correlations were computed using the online Spearman's Rho calculator created by Jeremy Stangroom (2022).

RESULTS AND DISCUSSION

SOURCES AND CHANNELS OF COVID-19 MISINFORMATION

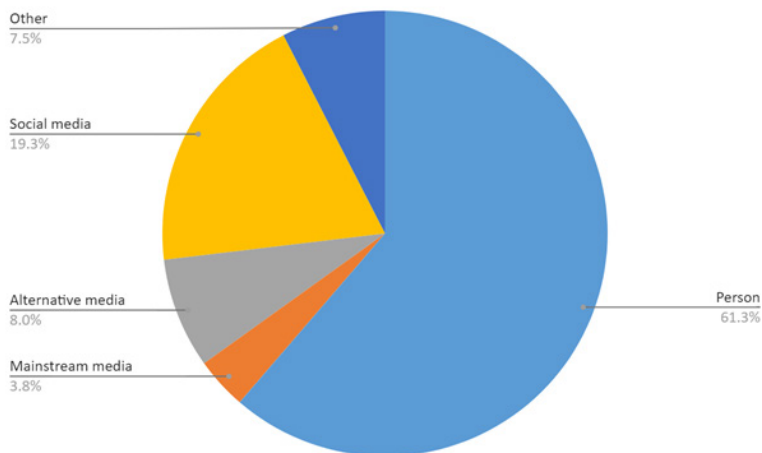
The findings showed that of the 211 fact checks, 61% of the debunked misinformation was attributed to people, 19.3% to social media (groups, pages) 7.5% to alternative media and 3.8% to mainstream media.

In cases where people were creating misinformation (N=130), the most active were the accounts of Marija Stojakovic (n=11), Petar Radenić (n=5), Srećko Sladoljev (n=5) and Viktor Jagarinec (n=3). In the social media category (N=41), the most active were the Facebook pages of "Građansko buđenje" (n=4) and "NovoNormalno" (n=2). The most active of the alternative media that were creating misinformation (N=22) were logicno.com (n=7); 2012-transformacij-asvijesti.com (n=5); istinomprotivlazi.info (n=5), and HOP.com (n=5). The most active of the mainstream media (N=8) were Jutarnji list (n=3) and RTL (n=2).

The authors of misinformation came from various parts of society, including religious groups (e.g., Ivan Dominik Iličić), right wing and anti-system party members (e.g., Ivan Pernar), etc. The social media includes profiles/pages/groups that have been opened under fake names (e.g., Michael Poulsen), or names that came from terms used to describe the contemporary pandemic world or conspiracy

theories (e.g., Bolji Svijet [Better World]; NovoNormalno [New Normal] and Novisvjetskiporedak [New world order]. The third group of authors represents online alternative media (see previous paragraph). The last group were activists who promoted their views on the contemporary world by denying the existence of COVID-19, promoting the non-wearing of protective masks, or anti-vaccine views. For example, Henna Maria had a YouTube channel and founded the Dawn of Peace in November, 2019 with the aim to “lead people beyond the current doctrine of apathy, deception and domination into a culture of compassion, truth and freedom” (Perić, 2020b). Similarly, Marija Stojaković has a YouTube channel and a Facebook profile, on which she publishes “subtitled videos promoting various conspiracy theories” (Perić, 2020a). The findings show that some of these were more influential than others. Marija Stojakovic was shared 337 times in publicly accessible Facebook pages and groups, Transformacija svijesti 133 times, logicno.com 108 times, Petar Radenić 106 times and Michael Poulsen 74 times.

Figure 1. Sources of COVID-19 Misinformation



Source: Authors

The location of the publication of the misinformation (N=211) were social media (72.4%), alternative media (N=46, 21.7%) and mainstream media (N=12, 5.6%). In a comparison to the data published by Naeem et al. (2020, p. 144), Faktograf.hr debunked 22.2% more social media content.

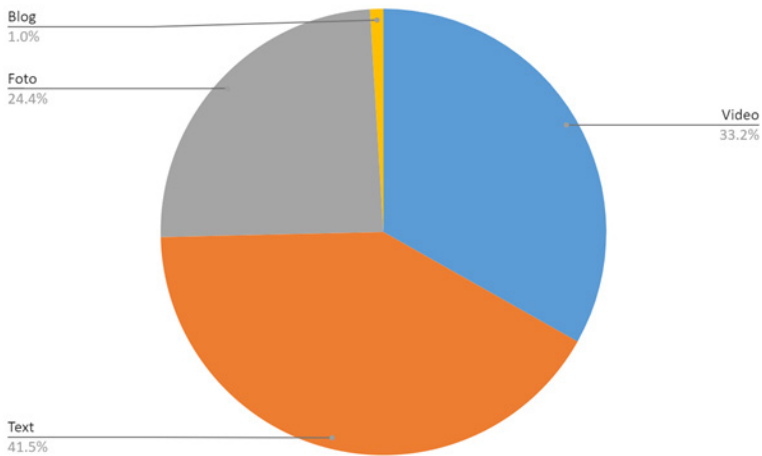
On the other hand, Faktograf's debunkings were published by just a few of the fact checkers working for this organization on their websites and blogs about COVID-19. Still, Faktograf did share all the debunkings on the organisation's Facebook page with a limited number of other pages, groups, and individuals who further disseminated them. Brautović (2022) shows that during the

two-year period (January 1, 2020-December 31, 2021), Faktograf’s debunkings were shared by SEE Check network (n=109), the journalist Denis Latin (n=39), and the Facebook group “Koronavirus Hrvatska – COVID19 – savjeti i informacije” (n=20).

TYPES OF THE MISINFORMATION AND DEBUNKES

The content that contained misinformation was mainly made up of text (n=85), video (n=68) and photos or infographics (n=50). All the fact-checks comprised textual information, in blog form, that was published on Faktograf.hr.

Figure 2. Types of Misinformation Content



Source: Authors

In the case of Faktograf.hr, all debunking was originally published in text form on the website and later shared on Faktograf’s blog about COVID-19 disinformation.

THE REACH OF THE MISINFORMATION AND DEBUNKES

The analyzed misinformation (N=211), in total, had 21.9 million of likes, 5.2 million of comments, 37.7 million of shares, with 13.5 million views (and were mainly made up of video content). On the other hand, fact-checks accomplished 28 thousand likes, 21.6 thousand comments, and only 7 thousand shares.

Table 1. Facebook Engagement of Analyzed Misinformation and Fact-checks

	likes	comments	shares	views*
Misinformation	21,949,541	5,202,750	37,740,074	13,524,873
Fact-checks	27,965	21,627	7,066	-
Ratio	784.9	240.6	5,341.1	-

* including data from YouTube & webpages stats

Source: Authors

On average, misinformation had 103,535 likes, 24,535 comments and 178,019 shares. The fact-checks' mean value for likes was 131,102 for comments, and 33 for shares.

In total, the misinformation that was analyzed had 784.9 times more likes, 240.6 times more comments and 5,341.1 times more shares on Facebook, than the fact-checks did. The results may be partially explained by the low level of co-operation between the fact-checking sites in the SEE region. As the data show, they rarely collaborate or share fact-checks. In 22.6% (N=48) of the fact-checks we recorded that Faktograf.hr's fact-checks were shared by other Facebook pages or groups. Mainly, this was done by See Check (n=22), the journalist Denis Latin (n=10) and the Facebook group "Koronavirus Hrvatska – COVID19 – savjeti i informacije" (n=8). On the other hand, the misinformation was heavily shared by a high number of Facebook groups and pages that cover the SEE region (Slovenia, Croatia, Serbia, Bosnia & Herzegovina, Montenegro, North Macedonia, Kosovo, Bulgaria, etc.), or the SEE diaspora in Western Europe, North America, Australia and New Zealand.

The Facebook Groups/Pages that were most active in sharing misinformation during period observed were: Saznajmo istinu o Koroni (N=42), Glavna grupa stranke Ivana Pernara (N=35) (, Borba protiv Okupacije (N=34) (, Grupa podrške Ivana Pernara (N=32), NAJBOLJA HRVATSKA (N=29, Vučić te laže, ne veruj šta ti kaže (N=23), Poštovaoci lika i djela dr Branimira Nestorovića (N=23), Narodni Referendum (N=21), and FORUM (N=17). In total, 560 public groups/pages shared misinformation 1551 times.

This special case represents the sharing of Faktograf.hr fact-checks) as a form of confirmation of misinformation or criticisms of Faktograf.hrs' work (the backfire effect). For example, in January, 2021, Faktograf.hr published a fact-check on how some misinformation had spread from Ireland to Croatia. The fact-check was later shared on the Facebook page of Građansko buđenje (Civil Awakening), with the comment "Again 'Authoritative, expert, credible' F ... graph revealed: the truth and the facts" (Građansko buđenje, 2021) The fact-check caused people to comment and to compare Faktograf.hr with criminal organizations (Građansko buđenje, 2021). Similarly, in January, 2021, Faktograf.

hr published a fact-check that related to mRNA vaccines not causing cancer. The post was picked by the Occupy Croatia Facebook group, which criticized the work of Faktograf. One of the users wrote “Hmm let’s see, who to trust ... a Nobel Prize winner, or a pimply student who spends all day on the computer surfing the internet and writing for Faktograf ... mumble mumble ... as soon as I decide, let me know ...” (Occupy Croatia, 2021).

TIME TO SPOT/DEBUNK MISINFORMATION

On average, it took 26 days for Faktograf.hr to correct misinformation. The sample was influenced by some fact-checks that were correcting information before the COVID-19 pandemic, or at the very beginning of the pandemic and, after their exclusion, the average time between the publication of the misinformation and debunking it was 10.9 days. The correction time that most often occurs in the data set (mode), was 4 days.

As the lifespan of a Facebook post is relatively limited, to perhaps just a few hours (Fiebert et al., 2014), we can speculate that the time taken by Faktograf.hr to correct such misinformation is too long (Kauk et al., 2021), and this is partially responsible for the readers’ low engagement with fact-checks. Table 2 shows that correction time moderately correlate with engagement with fact-checks. This result confirms previous findings but for a limited number of cases as negative correlation, although statically significant, was relatively low $r(209)=-0.21882$, $p=.00138$. The positive and limited correlation was found between engagements with misinformation and fact-checks $r(209)=0.1381$, $p=.0451$. So, based on this finding we can claim that there is a good chance that more popular misinformation will result in fact-checks are also becoming more popular. Also, when fact-checking organizations provide late responses to misinformation, the tardiness limits the number of people who access those fact-checks.

Table 2. Spearman’s Rho Correlation Between Correction Time and Total Engagement with Misinformation and Fact-checks

	Misinformation	Fact-checks	Correction time
Correction Time	$r(209) = 0.11564$, $p = .09386$	$r(209) = - 0.21882$, $p = .00138$	-
Misinformation	-	$r(209) = 0.1381$, $p = .0451$	$r(209) = 0.11564$, $p = .09386$
Fact-checks	$r(209) = 0.1381$, $p = .0451$	-	$r(209) = - 0.21882$, $p = .00138$

Source: Authors

The findings presented in Table 3 showed that we could not find statistically significant correlation between type of the misinformation content and engagement with that content. As Faktograf.hr was using only text to correct information from visual content we could not investigate the efficiency of fact-checking based on content type in this case.

Table 3. Spearman's Rho correlation between correction time and different engagement types (likes, comments, shares) and types of the content used for sharing misinformation*

		Correction time			
		Likes	Comments	Shares	Total engagements
Misinformation	Video	$r(66) = 0.06916$, $p = .52936$	$r(66) = -0.00843$, $p = .93898$	$r(66) = -0.04264$, $p = .69841$	$r(66) = 0.02915$, $p = .79114$
	Photo	$r(48) = -0.04764$, $p = .74254$	$r(48) = 0.00426$, $p = .97659$	$r(48) = -0.02248$, $p = .87687$	$r(48) = -0.06066$, $p = .67561$
	Text	$r(85) = 0.07106$, $p = .55884$	$r(85) = -0.08711$, $p = .47332$	$r(85) = 0.10456$, $p = .38903$	$r(85) = 0.05526$, $p = .64955$

* Fact-checks were appearing in only one form – text; correlation for misinformation in the form of text and blogs were calculated together

Source: Authors

The source of misinformation had negative correlation with correction time only when fact-checks were correcting social media content (Facebook and YouTube). From this we can speculate that the longer it took Faktograf.hr to correct information originating from social media the lower was social media users engagement with their fact-checks. In case of the alternative media and mainstream media, correction time did not have any statistically significant correlation with engagement.

Table 4. Spearman's Rho correlation between correction time and total engagement with misinformation and fact-checks based on the source of misinformation

	Social media (Facebook & YouTube)		Alternative media		Mainstream media	
	Misinformation	Fact-checks	Misinformation	Fact-checks	Misinformation	Fact-checks
Correction time	$r(152) = 0.10969$, $p = .17567$	$r(152) = -0.19343$, $p = .01624$	$r(44) = 0.13931$, $p = .36142$	$r(44) = -0.24415$, $p = .10603$	$r(10) = -0.09146$, $p = .80159$	$r(10) = -0.43903$, $p = .2043$

Source: Authors

In total, 19.3% of all of the analyzed misinformation was deleted after debunking, but that approach, as a way of combating misinformation on social media has some limitations. Our study recorded the cases when, even after the deletion of the original inaccurate content, it was still available as a snippet on Facebook. For example, the Serbian online media srpskidnevnik.com published a story “Started! They die from the vaccine in Norway, Israel and Slovenia, paralysis in Mexico!” in January, 2021, which was about people dying after receiving vaccines (Srpski dnevnik, 2021). The story was later shared by several Facebook groups and pages but the original was deleted. The story still lives on as a Facebook snippet (see Figure 3), which was liked 3531 times, commented on 838 times, and was shared 1351 times.

Figure 3. Print-screen of a snippet of deleted srpskidnevnik.com’s story on September 14, 2021



Source: Damnjanovic, B. (January 8, 2021), Facebook

CONCLUSIONS

This study has shown the extent of the infodemic, in terms of its quantity and the reach of the misinformation about COVID-19, in relation to which misinformation spreads beyond national borders, and cannot be combated by applying the approaches mentioned. The findings also question the efficiency of the

fact-checking approach in several ways. The data regarding the source of misinformation show that the ecosystem of online misinformation is quite complex, and that debunking campaigns cannot address all the possible sources, as they tend to be put up by people and are neither static websites nor pages/groups/accounts/channels. Deletions of accounts or profiles are quickly replaced with new ones. The study also found cases where the deletion of the original misinformation did not delete the snippets of shared misinformation on Facebook, if that content had originally been published somewhere on social media.

Although visual content on social media (videos, photos) leads to higher engagement and reach (Li & Xie, 2020), we did not find any statistically significant proof for that in the case of misinformation.

The reach of fact-checks is also limited. One website, or several websites, are unable to combat the misinformation that is given on hundreds of websites or pages, groups, accounts or channels. Another problem that is presented to fact-checking sites is based on national borders, as our data shows that misinformation has neither concrete nor insubstantial ones. Misinformation spreads online independently of both time and fact-checking attempts. Likewise, the response time is too long. At the moment that the fact-check is published, the original misinformation has already been spread, and it is only those rare users who will stumble upon corrections. Therefore, fact-checking organizations must devote their resources to reducing correction times as much as possible. As Kauk et al. (2021) contend “an early response combined with strong fact-checking and a moderate level of (...) deletion is necessary to control the diffusion of a conspiracy theory through a social network”.

Although fact-checking has limitations, which are caused by the motivation of the audience and the reduced reach and coverage of the fact-checkers, it should still be conducted, because it defends the culture of truth.

Even if the audience for fact-checking and community engagement is small, and even if an even smaller part of that audience is persuaded by it enough to trust the media and become more engaged and civic-minded, it may still be worth doing. Defending a culture of truth is important, as is signaling that journalism plays a role in keeping public officials and institutions accountable. Showing audiences that journalists are part of their community is surely not a bad thing. Being optimistic about your audience, and hoping they can learn to prefer quality news, and getting them involved in news gathering, is a good thing, to (Stiglitz, 2020, p. 133).

LIMITATIONS AND FUTURE RESEARCH

This study has limitations in relation to the sample and the methods deployed. In future work, the sample should be extended beyond Faktograf.hr's content, because it has debunked only a small part of the misinformation that has been shared on social media. The method should also be extended through the observation of routines inside fact-checking organizations and with in-depth interviews with those people who conduct fact-checking. Another direction of research about fact-checking efficiency should be directed to the analysis of those Facebook groups and pages that share misinformation, the misinformation snippets, and the role of time in the life span of misinformation.

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