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From pandemic to Plandemic: Examining the amplification and attenuation of COVID-19 misinformation on social media

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ABSTRACT

This study examines the proliferation of COVID-19 misinformation through Plandemic—a pseudo-documentary of COVID-19 conspiracy theories—on social media and examines how factors such as (a) themes of misinformation, (b) types of misinformation, (c) sources of misinformation, (d) emotions of misinformation, and (e) fact-checking labels amplify or attenuate online misinformation during the early days of the pandemic. Using CrowdTangle, a Facebook API, we collected a total of 5732 publicly available Facebook pages posts containing *Plandemic*-related keywords from January 1 to December 19, 2020. A random sample of 600 posts was subsequently coded, and the data were analyzed using negative binomial regression to examine factors associated with amplification and attenuation. Overall, the extended Social Amplification of Risk Framework (SARF) provided a theoretical lens to understand why certain misinformation was amplified, while others were attenuated. As for posts with misinformation, results showed that themes related to private firms, treatment and prevention of virus transmission, diagnosis and health impacts, virus origins, and social impact were more likely to be amplified. While the different types of misinformation (manipulated, fabricated, or satire) and emotions were not associated with amplification, the type of fact-check labels did influence the virality of misinformation. Specifically, posts that were flagged as false by Facebook were more likely to be amplified, while the virality of posts flagged as containing partially false information was attenuated. Theoretical and practical implications were discussed.

The COVID-19 pandemic is arguably the first pandemic where communication technology and social media were employed on a large scale to relay critical information in updating, connecting, and ensuring the safety of many people (World Health Organization, 2020). However, social media may be both a bane and a boon. Its far-reaching ability to amplify and spread information may also result in an unintentional or intentional spread of misinformation. This is echoed by the World Health Organization (WHO), which has coined the term “infodemic” to refer to the proliferation of excessive information, including misinformation (Department of Global Communications, 2020). Misinformation is generally defined as false or inaccurate information, regardless of the original intent of the information (Scheufele and Krause, 2019; Wardle, 2019). During the COVID-19 pandemic, a well-known case of misinformation circulated on social media platforms, suggesting that 5G technology was responsible for the creation or increased transmission of the virus. This misleading idea gained considerable attention, becoming

a popular discussion on Twitter in the UK. Numerous videos and articles supporting the false link were widely disseminated across various social media channels. The ramifications of this misinformation were serious, as people in Birmingham and Merseyside, UK, set fire to 5G towers as a result of these misguided fears. In a particularly concerning event, a telecommunications mast at Nightingale hospital in Birmingham was targeted and damaged, potentially hindering the hospital’s capacity to function effectively during a crucial period (Ahmed et al., 2020). The infodemic inhibits clear public health communication efforts in relaying accurate public health information to manage the pandemic, undermining efforts to bring the pandemic under control. Therefore, given how widespread social media is used in the relay of information for the COVID-19 pandemic, tackling the infodemic on social media has become increasingly pressing and critical to also manage the ongoing health crisis plaguing the world.

To address this challenge, our study employs the Social

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Amplification of Risk Framework (SARF) as a guiding theoretical lens (Kasperson et al., 1988). By extending the SARF, we aim to provide a more comprehensive understanding of why certain types of misinformation gain traction on social media platforms, while others do not. In order to achieve this, our investigation will encompass a holistic examination of factors associated with risk amplification. These factors include: (a) themes of misinformation, (b) types of misinformation, (c) sources of misinformation, (d) emotions of misinformation, and (e) presence of fact-checking labels by social media platforms. By thoroughly examining these factors, this study aims to offer valuable insights into the mechanisms behind the viral spread of misinformation on the social media platforms and inform future efforts to mitigate its harmful consequences.

1. Context of study – Plandemic posts on social media

Compared to previous pandemics, COVID-19 is unique as the interconnected brought about by social media fuels the spread of different types of misinformation surrounding it (Brennen et al., 2020). Prominent types of misinformation include skepticism toward health information and policies put forth by public authorities, controversies surrounding its prevention, treatment, and symptoms, as well as conspiracy theories hinging on anti-Chinese rhetoric and racism (Brennen et al., 2020; Pei and Mehta, 2020). At the height of the pandemic in 2020, one of the most prominent forms of misinformation circulating on social media was the pseudo-documentary Plandemic. This 30-min viral video featured discredited research scientist Dr. Judy Mikovits, who put forth a series of falsehoods surrounding COVID-19, such as wearing masks would activate the COVID-19 virus, flu vaccines would increase the chances of getting the virus, and arguing that there was rampant corruption within the U.S. public health service. At its peak, it reached over 8 million views on major social media channels of YouTube, Facebook, Twitter, and Instagram (Frenkel and Alba, 2020). Research has shown that active Facebook groups peddling conspiracy theories and far-right groups such as QAnon further enabled the viral spread of Plandemic on social media (Gallagher, 2020). Given the significant impact of Plandemic and the role of Facebook in its dissemination, this study will focus on examining the misinformation present in the Plandemic case and how these posts disseminated on Facebook. As one of the main platforms for information search today, Facebook has evolved from a platform for sharing personal information to one where people share and recommend a variety of information, including news (Olmstead et al., 2011). Furthermore, since Facebook posts do not have strict word limits (compared to Twitter's 140-character limit), it offers the possibility to gather more valuable information from posts. By analyzing the discourse surrounding Plandemic on Facebook, this research aims to provide insights into the factors that contribute to the amplification or attenuation of COVID-19-related misinformation.

2. Literature review

2.1. Social amplification of risk framework

SARF offers a theoretical lens for health communication scholars to understand why and how misinformation related Plandemic becomes amplified or attenuated in some instances. SARF postulates that risk perception is socially constructed, influenced by the public response to risk hazards, social experience of risk, and perceived consequences (Kasperson et al., 1988; Renn et al., 1992; Pidgeon et al., 2002). Factors such as information sources, channels, frequency and volume of media coverage, dramatization of media content, ambiguity, and the degree of dispute among experts all contribute to shaping these perceptions and attitudes (Kasperson et al., 1988). SARF comprises two components: the first stage focuses on the transfer of risk information, while the second stage addresses societal response mechanisms, including the response or ripple effect based on risk perception (Kasperson et al., 1988, 2003).

Since its introduction, SARF has been applied to various types of risk, including genetically modified foods (Frewer et al., 2002), Bovine Spongiform Encephalopathy (Lewis and Tyshenko, 2009), and the oral contraceptive pill scare (Barnett and Breakwell, 2003).

Initially developed and extended within traditional media settings, SARF has more recently been employed to understand social media's role in amplifying environmental and health risks, such as cancer risk (Strekalova, 2017), haze-related risk (Chong and Choy, 2018), Zika (Wirz et al., 2018) and dengue fever (Ng et al., 2018). Social media has changed the media environment originally envisioned by SARF (Fellenor et al., 2018), as it has increased the complexity of the risk amplification process (Chong and Choy, 2018; Fellenor et al., 2018) and has even become more powerful than traditional media in amplifying risk (Ng et al., 2018). Social media serves as a multidimensional source of information, channel, and social station for various behaviors, such as user interactions in the form of likes, comments, and reshares, which can influence the feedback and iteration of misinformation on these platforms (Zhang and Cozma, 2022).

In classic communication theory, "amplification" is defined as the intensification or attenuation of transmitted signals, resulting in the original signal having information added or removed before being passed on (Kasperson et al., 1988). In the context of risk events, amplification refers to the risk information that passes through communicators such as mass media, ultimately leading to public reaction (Ng et al., 2018). For example, the more interactions a post receives on social media, the higher its engagement. Comments, likes, and shares are often considered three dimensions of measuring social media engagement in research (Brubaker and Wilson, 2018; Kim and Yang, 2017; Jiang and Beaudoin, 2016). Prior research has partially argued that the act of amplification is a result of liking, commenting, and sharing as various extents to which information amplification occurs online (Strekalova, 2017). Liking a Facebook post results in a social signal of value to other users (Gittelman et al., 2015), while commenters act as "amplification stations for select information topics" (Strekalova, 2017). Based on previous studies, we conceptualize amplification as the total interactions of social media posts, where interactions include reactions, comments, and shares.

During the pandemic, many studies have shown that social media are misinformation amplification stations - users are exposed to and spread COVID-19 misinformation on social media platforms (Lee et al., 2021; Zhang and Cozma, 2022; Zhou et al., 2021). For example, public engagement, emotions, and information seeking on social media have been found to be strongly associated with the social amplification of risk (Zhang and Cozma, 2022). In addition, the types of misinformation during COVID-19 has been associated with their transmission during health crises (Zhou et al., 2021). While these studies have contributed significantly to our understanding of the amplification of misinformation during COVID-19, we cannot yet determine which specific content and forms of misinformation are more likely to be amplified and which are not. Given that SARF is a conceptual framework for examining social risk amplification and "initiating research as a guide to produce results beyond the scope of traditional frameworks" (Renn, 1991, p. 321), this study proposes a whole range of message-related factors within SARF, including (a) themes of misinformation, (b) types of misinformation, (c) sources of misinformation, (d) emotions of misinformation, and (e) fact-checking labels, to examine how they were associated with amplification or attenuation of misinformation.

2.2. Themes of misinformation

Prior research has showcased that "information behavior and audience engagement is topic dependent" (Strekalova, 2017), implying a connection between salient themes in social media posts and information amplification. Strekalova (2017) argued that awareness of and interest in a particular topic were important antecedents of social media user engagement. For example, risk-related messages tend to receive

more amplification through user engagement compared to non-risk messages on Facebook (Strekalova, 2017). A study on social media in China also found that health warnings, advice and help-seeking misinformation significantly increased the spread of COVID-19 misinformation (Zhou et al., 2021). In such cases, certain themes of misinformation could be more widely disseminated and have more adverse effects due to the power of social media. During the COVID-19 pandemic, misinformation with a scientific veneer has been more strongly associated with a decline in vaccination intentions (Loomba et al., 2021). As a result, it is critical to situate our analysis of misinformation within its specific social milieu, where we believe that themes more likely to be amplified may also be indicative of broader social issues. Therefore, this study asks the following two research questions (RQ):

RQ1. What are the different themes of misinformation in Plandemic-related content?

RQ2. What is the relationship between the themes of misinformation and the amplification or attenuation of Plandemic posts on Facebook?

2.3. Types of misinformation

Prior research on misinformation has primarily focused on broader macro-level variables, such as social networks and information ecologies (DiFonzo et al., 2013; Scheufele and Krause, 2019), or more content-based variables, such as the thematic categories of misinformation (Chen et al., 2018). Tandoc et al. (2018) proposed six types of fake news based on two dimensions: factuality and level of deception. These types include news satire, news parody, fabrication, manipulation, advertising, and propaganda. A preliminary analysis of COVID-19 misinformation revealed that misinformation containing elements of truth is more susceptible to amplification (Brennen et al., 2020). Building on these prior studies, we developed a classification system for misinformation related to Plandemic on Facebook. We divided the misinformation into five types: satire or parody, manipulated content, fabricated content, both manipulated and fabricated content, and imposter content. Therefore, in terms of types of misinformation on social media, this study posed the following research question:

RQ3. What is the relationship between the types of misinformation and the amplification or attenuation of Plandemic posts on Facebook?

2.4. Sources of misinformation

The realm of research on the sources of misinformation and the direction of amplification presents mixed findings. The sources of misinformation can vary widely due to the extensive range of actors involved in its dissemination, from prominent public figures like politicians to collateral influences (i.e., scientists, universities, science journalists, and readers of science news that may unintentionally spread misinformation among non-expert audiences), or organized and active groups of individuals that “unit [ing] their purported knowledge and political actions” (Hochschild and Einstein, 2015; Scheufele and Krause, 2019). Thus, sources of misinformation may move in a top-down manner, diffusing from publicly prominent figures, or from bottom-up actors (Brennen et al., 2020). In the context of the Plandemic misinformation movement, it is notable that the original video stemmed from a relatively outlandish and previously unheard-of source. We argue that the amplification of misinformation could be attributed to prominent public figures spreading misinformation via their Facebook posts. In this regard, this research sought to explore:

RQ4. What is the relationship between the sources of misinformation and the amplification or attenuation of Plandemic posts on Facebook?

2.5. Emotions of misinformation

The psychosocial role of emotions influencing misinformation

amplification has been extensively studied, with findings generally suggesting that information with a higher emotional impact is more likely to be amplified (Milkman and Berger, 2014; Strekalova, 2017; Vosoughi et al., 2018). Emotions, especially negative emotions such as anger and fear, can be predictors of risk amplification in social media (Scheufele and Krause, 2019; Wirz et al., 2018). Zhang et al. (2018) found that high-arousal negative emotions (e.g., anger, fear) were more influential than low-arousal emotions (e.g., shame, guilt) in influencing people’s post-crisis social media engagement intentions. A study in the United States found that in the early days of COVID-19, when the public primarily relied on social media for information, blame and anger had a significant impact on the amplification of risk information (Zhang et al., 2021). In addition, blame is an important factor in risk amplification beyond the initial risk or risk event. For instance, public blame sentiment toward the United States government executive triggered a second peak on Twitter about the Zika risk amplification process (Wirz et al., 2018). However, in a study on risk amplification of H7N9, Zhang et al. (2017) found that positive emotions accelerated the spread of outbreak information on social media more than neutral emotions. Based on prior research, we believe that posts containing different types of emotions will have a strong relationship with total interaction. Therefore, this study raises the following question:

RQ5. What is the relationship between the emotions of misinformation and the amplification or attenuation of Plandemic posts on Facebook?

2.6. Fact-checking labels

Social media sites, such as Facebook, are designed to amplify information by enabling the sharing and discussing of content within various established social networks, which may inadvertently facilitate the spread of misinformation with relative ease (Messing and Westwood, 2014; Scheufele and Krause, 2019). Algorithmic sorting of content on Facebook’s feed prioritizes users’ friends and family members, potentially contributing to misinformation amplification (Isaac, 2018; Mosseri, 2018; Mozur, 2018). In recent years, due to public pushback against big tech companies as hotbeds of misinformation, social media platforms have taken steps to address and slow the spread of misinformation. One such strategy is to build in fact-check labels. For example, Facebook implemented a third-party fact-checking system within the app, which allows independent fact-checkers to identify misinformation. Once flagged, these posts may be removed, experience reduced visibility, or receive labels indicating the specific type of misinformation they contain (Facebook, 2020). In the context of COVID-19, Facebook has taken unprecedented fact-checking action on fake content shared online by users (Clarke, 2021). While we believe that misinformation posts without any fact-checking labels by Facebook would be more likely to be amplified, research in recent years has yielded mixed results regarding the efficacy of fact-checking tags in slowing the spread of misinformation. Several studies have shown that fact-checking labels was effective (Bode and Vraga, 2015; Zhang et al., 2021; Clayton et al., 2020), but some articles have demonstrated a limited impact (Geeng et al., 2020). As such, we asked:

RQ6. What is the relationship between the presence of fact-checking labels and the amplification or attenuation of Plandemic posts on Facebook?

3. Methods

3.1. Data collection

To determine appropriate search terms for our study, we referred to Google Trends. Google search terms were used as a proxy to gauge the popularity and search volume of specific keywords or phrases associated with the #Plandemic movement on Facebook. The most prominent Plandemic-related keywords identified through Google Trends were “dr

Judy Mikovits” and “Plandemic”. Therefore, our study employed the following Boolean search terms to extract Facebook data: “dr judy mikovits” OR “Plandemic” AND “Covid-19 OR covid19 OR coronavirus OR coronavirus”. We then used CrowdTangle, a public insight tool developed by Meta, to extract public posts available on Facebook. The time frame of January 1, 2020, to December 19, 2020, was used to capture the trends surrounding the #Plandemic movement in order to get as many relevant posts as possible. In total, we collected 5732 posts from public Facebook pages. The data we obtained from CrowdTangle encompasses the account, username, post creation time, post link, post content, as well as the number of likes, comments, and total interactions on the post. To assess the amplification or attenuation of Plandemic posts in this study, we used total interaction as a measurement. Interaction in CrowdTangle encompasses the sum of reactions, comments, and shares for each post, serving as an indicator of the post’s engagement and reach within the Facebook community (Miles, 2022). For example, if one person sees a post three times and likes it, and comments on it, the number of interactions is 2 (Miles, 2022).

3.2. Content analysis

To qualitatively code the content of the selected posts, we randomly sampled 10% of the initial volume of Facebook posts (approximately 600 posts) for analysis. Our content analysis consisted of three steps. First, to address RQ1, two authors conducted a thematic analysis of the selected posts using inductive coding techniques. The two authors independently used inductive open coding to identify themes of *Plandemic* posts. Subsequently, they scrutinized the outcomes stemming from the coding process and, working autonomously, extrapolated broader thematic categories. To ensure the rigor and reliability of the findings, a third author was enlisted to meticulously review, deliberate upon, and ultimately finalize the consolidated list of eight overarching thematic categories.

Second, to address RQ2 to RQ6 and provide a multidimensional understanding of the misinformation present, we drafted a codebook for coding based on Brennen et al. (2020) and Lee et al. (2021), which included (1) misinformation, (2) themes of misinformation, (3) types of misinformation, (4) sources of misinformation, (5) emotions of misinformation, (6) fact-checking by Facebook. In determining whether a Facebook post is misinformation, we adopted a multi-step approach recommended by the World Economic Forum (Broom, 2020). First, cross-check the information against reputable sources and assess the reliability of the post’s source, such as the WHO (World Health Organization, 2022), the U.S. Centers for Disease Control and Prevention (Centers for Disease Control and Prevention, 2023), and Google fact checking tools (Google, n.d). Next, look for fact-checking labels on the post and analyze its content for emotional language or provocative elements. Additionally, verify the authenticity of any images or videos using reverse image search tools, and check the date of the information to ensure its relevance. Finally, consult fact-checking websites to verify the accuracy of claims. Posts categorized as non-misinformation were subsequently excluded from further coding categories (2) to (6). Further elaboration of the categories for each coding category and their respective definitions is summarized in Table 1. While a post could fit into multiple thematic and emotional categories, we coded the post into the most dominant category, which means that a post has only one most compatible thematic and emotional category. Here, source of misinformation is the page on which the post appears, not the original source of the message (i.e., who created the misinformation originally).

Finally, we engaged two independent coders who were thoroughly trained in the coding process. To ascertain intercoder reliability, we conducted two distinct rounds of coding. In the initial round, both coders independently examined the top 10% of posts (60 posts), addressing any discrepancies in their coding through discussion and reaching consensus to guarantee a shared understanding. Subsequently, in the second round, the coders independently revisited and recoded all

of the posts. To evaluate intercoder reliability, we utilized Cohen’s Kappa, which is appropriate for the nominal level of measurement and the participation of two coders. We achieved high intercoder reliability scores across several categories, including Misinformation (Cohen’s Kappa = .81), Themes of Misinformation (Cohen’s Kappa = .66), Type of Misinformation (Cohen’s Kappa = .70), Source of Misinformation (Cohen’s Kappa = .84), Emotions of Misinformation (Cohen’s Kappa = .71), and Fact-checking by Facebook (Cohen’s Kappa = .81). A comprehensive presentation of the intercoder reliability scores can be found in Table 2.

3.3. Negative binomial regression

Addressing RQ2-6 on locating key factors affecting the amplification of COVID-19 Plandemic misinformation, negative binomial regression was carried out. This model was chosen to account for the over-dispersed nature of the count-based data collected (Date, 2019). We used this regression model to examine the relationship between total interaction for misinformation, configured as the dependent variable, and the other factors, configured as independent variables, such as the themes of misinformation, types of misinformation, sources of misinformation, emotions of misinformation, and presence of fact-checking by Facebook.

4. Results

4.1. Descriptive statistics

Out of the 600 coded posts, 333 (55.50%) posts were coded as misinformation, while the remaining posts consisted of critiques and corrections of *Plandemic*. RQ1 asked different themes of Plandemic misinformation related to Covid-19. The results eight themes of misinformation: Public authority personnel, action or policy (n = 91, 27.33%), treatment and prevention of virus transmission (n = 73, 21.91%), Origins of the virus (n = 48, 14.41%), Social impact (n = 39, 11.71%), Virus information (n = 34, 10.21%), Diagnosis and health impacts (n = 26, 7.81%), Private firms (n = 18, 5.41%), and Economic impact (n = 4, 1.2%).

Regarding the types of misinformation, most posts were classified as manipulated content (n = 143, 42.94%), followed by a combination of both manipulated and fabricated content (n = 116, 34.83%), fabricated content (n = 59, 17.72%), satire or parody (n = 15, 4.50%), and no imposter content. Manipulated content included original content or information manipulated to form misinformation, whereas fabricated content comprised content that entirely false and misleading information, intentionally designed to deceive and cause harm. Thus, the distortion of existing or accurate content was a prevalent feature of the Plandemic misinformation identified in our study. Our analysis regarding the source of misinformation identified three distinct categories. The first category consists of prominent persons or sources, such as politicians, celebrities, experts, or news sources, contributing to 95 posts (28.52%). The second category encompasses non-prominent persons or sources, accounting for 156 posts (46.85%). Finally, the third category includes instances where the source was removed or missing, which represented 82 posts (24.62%).

Our results of the emotions expressed in the posts revealed a diverse range of sentiments, with the majority being neutral (n = 160, 48.05%) or expressing blame and anger (n = 68, 20.42%). Notably, there were no posts expressing hope or caring. A smaller percentage of posts conveyed fear and anxiety (n = 17, 5.00%), while an even fewer number displayed happiness, joy, or celebration (n = 5, 1.50%). Lastly, 83 posts (25.00%) did not have discernible emotions. Regarding the fact-checking labels in the posts, 114 (34.23%) had no labels present. For flagged posts, 48 (14.41%) were marked as false information, meaning they had no basis in fact. Furthermore, 112 (33.63%) were flagged as partly false information due to containing some factual inaccuracies. A smaller

proportion, 36 (10.81%) posts, were flagged as altered, meaning media content was edited in a misleading manner beyond adjustments for clarity. Only 17 (5.10%) posts were flagged as missing context, indicating that additional information was needed to prevent misleading interpretations. A total of 6 (1.80%) posts were set to private or deleted, rendering the content inaccessible to the coders.

4.2. Factors affecting amplification or attenuation of misinformation

In the various categories of theme, emotions, type of misinformation, source of misinformation, and type of fact-checking by Facebook, RQ2-6 attempted to examine which factors in these different categories would be associated with the amplification or attenuation of misinformation. The negative binomial regression results were presented in Table 3.

RQ2 examined the relationship between the themes of misinformation and the amplification or attenuation of Plandemic posts on Facebook. Compared to the reference category of public authority personnel, action or policy, statistically significant results showed that the themes were positively associated with total interactions included: treatment and prevention of virus transmission ($\beta = .51, p < .01$), social impact ($\beta = 0.46, p < .01$), diagnosis and health impacts of the virus ($\beta = 0.43, p < .01$), virus origins ($\beta = 0.41, p < .05$), and private firms ($\beta = 0.28, p < .05$). Therefore, misinformation involving themes directly related to public health responses to COVID-19 in terms of treatment, prevention, health impacts, and origins were more likely to be amplified. Conversely, the categories of virus information and economic impact were not statistically significant.

RQ3 examined the relationship between the types of misinformation and the amplification or attenuation of Plandemic posts on Facebook. The findings indicated that compared to satire or parody content, the categories of both manipulated and fabricated content, manipulated content and fabricated content did not yield statistically significant results for analysis, while none of the posts were categorized as imposter content.

RQ4 examined the relationship between the sources of misinformation and the amplification or attenuation of Plandemic posts on Facebook. The results showed that none of the categories analyzed yielded statistically significant results. In addressing RQ5, which examined the relationship between emotions of misinformation and the amplification or attenuation of Plandemic posts on Facebook, the findings showed that using neutral emotions as the reference group, only posts with emotions not included in the other categories demonstrated a moderately negative relationship with total interactions ($\beta = -.43, p < .05$). The categories of blame/anger, fear/anxiety, and happiness/joy/celebration did not yield any statistically significant results, whereas none of the posts were coded as hope/caring.

Lastly, RQ6 examined the relationship between Facebook's fact-checking labeling and the amplification or attenuation of Plandemic posts on Facebook. Using the category of unflagged posts as the reference, the results showed that posts flagged as false information ($\beta = .39, p < .01$) was positively associated with the total interaction, while flagged as partly false information ($\beta = -0.31, p < .01$) had a negative relationship with the total interactions.

5. Discussion

The spread of the pseudo-documentary Plandemic on social media is an example of how misinformation could run rampant during the COVID-19 pandemic. Drawing upon and extending the social amplification of risk framework, we examined the key factors associated with amplification or attenuation of misinformation, including themes, types, sources, emotions, and the presence of fact-check labels. Our research yielded two key findings in dissecting the various factors involved in the process of misinformation amplification. First, we established Facebook users as social amplification stations within the SARF framework, examining how the perception of risk varies and encompasses both the

original risk event of the pandemic and the misinformation surrounding it. We identified Facebook as a social channel within the SARF framework. Second, we examined the significance of social channel design in risk and misinformation amplification, exploring how Facebook's fact-checking labeling impacts user engagement and the amplification of misinformation. Consistent with prior research on SARF and social media, we found that social media users act as social amplification stations, with their level of interaction with information reflecting the amplification or attenuation of such information online (Strekalova, 2017).

The most frequently occurring themes in Plandemic-related misinformation include public authority personnel, action or policy, followed by treatment and prevention of virus transmission. This may suggest a mistrust of political and scientific institutions within society. In the context of misinformation, the perception of risk becomes notably more varied and expansive. Beyond the original risk event of the COVID-19 pandemic, the perception of risk now also includes misinformation surrounding the pandemic. Due to the pandemic's evolving nature, risk perceptions are not limited to the virus but also extend to public health safety measures prescribed to curtail its spread. This is highlighted by the dominant themes of amplified misinformation. User engagement is also topic-dependent, influencing the salient information circulated online (Strekalova, 2017). Misinformation with themes relating to public health responses to the COVID-19 virus typically exhibits a strong effect size, signaling a strong relationship between these misinformation topics and user engagement and subsequent amplification. Additionally, beyond immediate health impacts or measures, perceived risk in the form of misinformation on social issues and private firms further underscores the diverse set of risk perceptions that expand beyond the initial risk event. These posts seem to reflect the ripple effects of the initial misinformation that was amplified, reinforcing the complex and multidimensional character of misinformation, which may be amplified and attenuated in various ways.

Additionally, the most common misinformation type tends to be either manipulated content or a combination of both manipulated and fabricated content, implying that misinformation often contains elements of truth. This observation aligns with previous research (Brennen et al., 2020), and suggests that the distortion of existing or true content may potentially further complicate fact-checking efforts. Interestingly, our findings show that misinformation not containing emotions of blame/anger, hope/caring, fear/anxiety, or happiness/joy/celebration was less likely to be amplified compared to neutral posts. In relation to SARF, this may suggest that emotions play a prominent role in the amplification of misinformation.

The SARF framework also posits that feedback and iteration processes are involved during the amplification and attenuation stages of information dissemination. It is crucial to note that although we use total post interactions to measure the amplification and reduction of misinformation, the total number of interactions is not a direct proxy for the amplification of misinformation. Instead, total interactions are an indicator of a post's engagement and reach within the social media community. In our research, these feedback processes manifest in the interaction between the social channel platform (Facebook) and the audience social amplification stations, as analyzed through the relationship between total interactions and the presence of Facebook's fact-checking labels. Interestingly, when Facebook applies a "partly false" label, the post is less likely to be amplified, suggesting that information amplification of such posts is also reduced. This highlights the importance of acknowledging the role of social media platforms in amplifying misinformation, particularly in terms of how feedback processes between the platform and audiences may be shaped by the platform's design.

However, posts flagged as false information by Facebook were more likely to be amplified than misinformation that was not flagged. This seems inconsistent with Facebook's fact-checking program, which claims that once fact-checking labels are administered by independent

fact-checkers, the platform will also take action to limit the distribution and amplification of such posts (Facebook, 2020). Our findings might suggest that the fact-checking program may not be adequately comprehensive in capturing the entire scope of misinformation posts. Although measures are taken to curb misinformation, the reactive nature of the fact-checking program results in a gap between the misinformation amplified and misinformation removed or barred from amplification. Moreover, some studies have found that the effects of fact-checking labels are limited. For example, Oeldorf-Hirsch et al. (2020) suggested that fact-check labels might not have a beneficial effect on credibility perceptions. Meanwhile, fact-checking labels failed to work when used for fear-arousing misinformation, which may be due to the boomerang effect (Lee et al., 2021). The boomerang effect refers to the reaction by an audience that is opposite to the intended response of persuasion messages (Cho and Salmon, 2007; Hart, 2014). This unintended effect often occurs in health and science communication campaigns, such as during COVID-19, where people's compliance with social distancing interventions is not absolute, even when strictly enforced (Balog-Way and McComas, 2020). Additionally, the valence of these interactions, whether affirmative or adverse, may play a critical role in shaping the dissemination patterns of posts. Consequently, an alternative explanation might be that posts flagged as false information by Facebook could provoke heightened negative emotions (e.g., anger, fear), thereby contributing to an increase in "amplification" (Han et al., 2020). When posts are flagged as misinformation, users may opt not to share the content but respond emotively instead, such as by attaching anger reactions or posting irate comments. Given our reliance on CrowdTangle's computation of total post interactions, it is imperative to recognize that negative emotions are also encompassed within the scope of "amplification." Nevertheless, in actuality, these adverse emotions might signify a boycott or repudiation of misinformation, as opposed to endorsing it (Eberl et al., 2020).

Recognizing the complex social process of negotiating the perception of risk, SARF proves to be notably relevant in dissecting how misinformation may be amplified through social media. While prior research has acknowledged the role of social media users as amplification stations (Strekalova, 2017; Wirz et al., 2018), our study attempts to capture a more comprehensive analysis of how users interact with Facebook as a social channel. The design of the algorithm and implementation of fact-checking labels within the infrastructure of the social channel also impact misinformation amplification. Thus, we propose that the analysis of SARF in social media should also encompass an examination of how the social channel interacts with its users and how this, in turn, shapes information amplification. Given the prolonged and ever-evolving nature of the COVID-19 pandemic, another theoretical implication of using SARF to analyze misinformation is to recognize how risk perception of the original risk event may subsequently expand to include other topics related to the initial risk event, creating ripple effects beyond a singular risk event. This observation is consistent with prior research (Wirz et al., 2018).

5.1. Practical implications for tackling the infodemic

The information plague, characterized by misinformation and the prolific nature of the information-swamped public, calls for a multi-pronged solution. Firstly, this study underscores necessity of understanding the micro-level perspective on how Facebook users leverage the platform to amplify their risk perception. Health communication practitioners should be attentive to the role of social media users in disseminating and amplifying misinformation, taking measures to prevent users from exacerbating misinformation on social media. For example, implementing flags and alert pop-ups for misinformation can be beneficial. When people seek information about COVID-19, social media platforms can direct them to more reliable sources—such as the WHO or official health agencies—for accurate information (Zarocostas, 2020). Recognizing the significance of social media users, it is crucial to

address misinformation through user interaction. A long-term approach involves enhancing users' ability to identify misinformation. Our research indicates that fact-checking is not always effective, and improving social media users' information literacy can fundamentally address the problem of misinformation dissemination.

Secondly, our result showed that explicitly labeling posts as false may trigger a boomerang effect—people may be resistant. As such, fact-check labels should be applied to misinformation by alerting users to the potential for misinformation, which seems to reduce amplification. Gisondi et al. (2022) suggested that social media companies could label the blurred lines between factual news and falsehoods about COVID-19 for users through better oversight of their platforms. Social media platforms should not solely focus on identifying every instance of misinformation but instead need to reconsider their algorithms to mitigate the spread of COVID-19 misinformation, taking into account users' psychological factors.

Thirdly, it is essential to expand the reach of experts and official accounts, with expert or institutional accounts possessing a substantial following on social media providing COVID-19 content expertise. Given the severe negative consequences of disinformation, our study emphasizes the need to address this situation by concentrating on other characteristics of information, such as misinformation themes, types, emotions, and fact-checking labels. Health organizations can debunk circulating misinformation by proactively high-quality information on social media that stresses facts without waiting for direct sharing in their streams. This approach expands the opportunity to observe corrections as they occur (Vraga and Bode, 2021). Most importantly, managing the proliferation of misinformation and infodemic necessitates deeper collaboration among social media companies, doctors, scientists, and traditional media.

6. Limitations and future research

There are several limitations to this research. One limitation of this study is the potential for biases regarding misinformation due to the possibility of completely removed posts not being mentioned in the analysis. The data collected was limited to publicly available Facebook data, thus it would not contain private, deleted, or removed posts. While efforts were made to include as many relevant posts as possible, it is possible that some posts containing misinformation were removed before they could be captured. Due to the retrospective method of collecting data, this analysis may not truly encapsulate the full extent of how misinformation is amplified on various social media platforms. Additionally, due to the lack of access to the time order in which posts are fact-checked, this research cannot compare the extent of information amplification for misinformation labelled and not labelled by Facebook. As such, the findings of this study should be interpreted with caution and further research should be conducted to explore the prevalence of misinformation on this topic. It is important to note that the limitations of this study do not negate the valuable insights gained from the analysis of the included posts.

Also, accounting for the statistically insignificant data, there was an inability to establish the relationship between the three categories of emotional frames of misinformation, type of misinformation, and source of misinformation with the total interactions of the posts. For the category of emotional frames, the only statistically significant category was on posts that did not fall into the other established emotional categories. This could be due to the subjective perception of emotion, and future research could examine the varied spectrum of emotions present in misinformation, and how it impacts misinformation amplification. Similarly, for the type of misinformation, the lack of a statistically significant relationship between the type of misinformation and total interactions garnered may indicate a need to probe further into the configuration of the different types of misinformation. This could be carried out in the form of a more in-depth textual analysis of the type of content that makes up misinformation. To better analyze how the source

of misinformation impacts misinformation amplification, future studies could use network analysis to better understand the type of network of misinformation amplification, such as in terms of its modularity or density.

7. Conclusion

The COVID-19 pandemic has underscored the crucial role of social media in mobilizing and orchestrating public health responses. The rapid dissemination and far-reaching impact of misinformation, if left unchecked, can prove detrimental, undermining communication efforts by global public health authorities. Our study demonstrates that, when addressing misinformation, it is vital to adopt a comprehensive theoretical perspective informed by our extended social amplification of risk framework. This approach necessitates paying close attention to the

nature of conversations surrounding COVID-19 and related policies online, as well as the types and categories of misinformation. By doing so, we can develop effective communication strategies to curb the onslaught of misinformation, as not all fact-checking labels yield successful outcomes.

Data availability

Data will be made available on request.

Acknowledgements

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Appendix

Table 1
Coding categories of misinformation.

Coding Categories	Definition	N (%)	Example Tweet
Misinformation	False or inaccurate information, regardless of the original intent of the information	333 (55.50%)	<p>"I am reposting this video because people continue to report that the previous uploads prematurely end. I believe what we presented here on April 11th is very important, if I am permitted to say, especially in the light of the recent "Plandemic" video featuring Dr. Judy Mikovits, with whom I'm very familiar beyond her recent videos. I have her books. I must point out that it was weeks before this video and weeks before Fox News and now other mainstream media began reporting it that we exposed this University of North Carolina - Wuhan Laboratory - Dr. Fauci background to this novel coronavirus on April 11th. IJS. www.drwesley.online</p> <p>"Pandemic or #plandemic? The latest viral internet video is a conspiracy theory documentary chock full of misleading claims about the origin of #coronavirus, flu vaccines, and wearing a mask. The video is clearly produced by professionals and looks nice. But we know that there's always more than meets the eye.</p> <p>In this video, we talk about some claims hand-picked from PolitiFact's roundup of misleading claims from the documentary.</p> <p>This video was produced in partnership with PolitiFact, you can check out their excellent reporting on the 'Plandemic' video here:</p> <p>Fact-checking "Plandemic": A documentary full of false conspiracy theories about the coronavirus https://www.politifact.com/article/2020/may/08/fact-checking-plandemic-documentary-full-false-con/</p> <p>Also check out our fact-check referenced in the video (Can this malaria drug (chloroquine) also cure COVID-19?) uploaded previously to IGTV in our Coronavirus series.</p> <p>MediaWise is a nonprofit media literacy project of The Poynter Institute. Poynter is also home to PolitiFact."</p>
Information	Factual information or non-misinformation	267 (44.50%)	
Themes of Misinformation			
Public authority personnel, action, or policy	State policies, actions, communications and recommendations, or pertaining public authority personnel such as politicians	91 (27.33%)	<p>"Watch this highly informative video by fellow physician Dr. Carrie Madej, explaining the 3 major components of the Moderna vaccine and the implications. This is a must view video. If this video doesn't open the eyes of those who don't get it, who I refer to affectionately as "sheeple", nothing will! I've previously brought up how if we allow the mandatory vaccination rhetoric to proceed, humans will no longer be human. And I've talked about Moderna and the implications of their RNA vaccine which has never been commercially produced before. But Dr. Madej does an outstanding job going into greater detail. Watch this, and share it with everyone.</p> <p>But Dr. Madej is wrong about one thing. She says it "may" cause genetic modification in our genome. Remember, the function of RNA is to repair and re-write the DNA. She's being overly generous with her words ... it WILL cause a genetic change which will continue to re-write and "repair", ie, change our DNA.</p> <p>In addition, the PLANDemic full length movie came out yesterday. If you haven't watched it, watch it now on Bitchute or on London Real.</p> <p>#covid19 #covidconspiracy #corona #patriots #patriot #qanon #DrButtar #AHEADMAP #AdvancedMedicine #AdvancedMedicineConference #IADFW #Fitness #Longevity #livelonger #livehealthy #power #facts #knowledge #truth #empowerment #livefree #livefreeordie #populationcontrol #whistleblower #soldiers #wechangetheworld #healthfreedom #health #freedom #medicalfreedom"</p>

(continued on next page)

Table 1 (continued)

Coding Categories	Definition	N (%)	Example Tweet
Private firms	Descriptions of commercial firms or multinational corporations, and their impact or influence pertaining to the virus	18 (5.41%)	<p>"Ben Swann takes a look at the highly unusual timeline by which Moderna Therapeutics is developing its CO-vld 19 virus vaccine. Now, 4 scientists with the NIH claim they hold partial patent rights on that vaccine and stand to make up to \$150,000 per year. Meanwhile, as Moderna's stock price continues to soar, 5 top executives have sold off \$89 million dollars worth of shares, even as the company continues to bypass standard vaccine protocols in the development of its CO-vld v@ ccine"</p> <p>#plandemic #scamdemic #truthseekers #covid19 #truthbomb #spiritualrevolution #pizzagate #fifthdimension #exitthematrix #spiritualawakening #newearth #freethinker #lawofone #mkultra #chemtrails #follow #greatawakening #thetruthwillsetyoufree #instagram #truth #newworldorder #5dconsciousness #wakeup #governmentcorruption #higherfrequency #truths #truthhurts #truthbetold"</p>
Treatment and prevention of virus transmission	Descriptions of possible cures for the virus, vaccine development, availability, or measures to prevent virus transmission, such as social distancing, quarantine, mask-wearing, etc	73 (21.91%)	<p>"It's so easy nowadays to tell who is a brainwashed idiot and who isn't. Just check if they're wearing a mask! Don't waste a minute of your time trying to talk some sense into the few cubic centimeters of brain cells inside their thick heads. They've been completely and irreversibly brainwashed thanks to the years they spent in indoctrination centers (schools in doublespeak) and countless hours of exposure to corporate media's powerful propaganda machinery. It's an insult to the sheep to call these brainwashed idiots sheep. At least sheep are true to their nature as command-following animals. The sheeple, however, lost their nature and dignity and the ability to think critically. They're simply obedient trend-following fearful morons. They do what they're told. And they're always terrified of something like the TV conditions them to be. Fear controls them, which is precisely the same reason why people hold onto their religions and why religion will never go away. Because the fear of death and the unknown is the most ancient fear of all while religions are in the business of selling afterlife fantasies. And now wearing a mask has become a religious ritual for these fearful idiots.</p> <p>#DoYourPartStayApart #N95Masks #MaskOfShame #NoMaskNoService #ItsForYourSafety #ForYourSafety #BeSafe #StaySafe #ProblemReactionSolution #ShockDoctrine #TheShockDoctrine #PlannedPandemic #Plandemic #ID 2020 #TrustTheHealthExperts #TrustTheExperts #MedicalMartialLaw #MedicalMartialLaw 2020 #Event201 #NWO #NewWorldOrder #OneWorldGovernment #OWG #HouseArrest #HouseArrestForEveryone #COVID19 #Coronavirus #COVID19Lockdown #melbourne"</p>
Diagnosis and health impacts	Symptoms of the virus, reports of Covid-19 cases, or negative health implications, including both physical and mental health	26 (7.81%)	<p>"Yes I did check and did verify that this is true. You can as well. Government ordered hospitals many weeks ago to stop performing elective surgeries to make way for the projected numbers of coronavirus patients. So they did. And in so doing, they cut off their revenue streams. So Congress passed legislation giving hospitals billions of dollars to treat coronavirus patients. Conflict of interest? Yikes. Yes! One (many are Dr's saying) Dr. Said: "When I'm writing up my death report I'm being pressured to add COVID. Why is that? Why are we being pressured to add COVID? To maybe increase the numbers, and make it look a little bit worse than it is. We're being pressured in-house to add COVID to the diagnostic list when we think it has nothing to do with the actual cause of death. We are seeing this across the US! This is why our numbers are much higher than other countries! The actual cause of death was not COVID, but it's being reported as one of the diseases processes. ... COVID didn't kill them, 25 years of tobacco use killed." Does it get any clearer than that? Seriously, America. The only reason America is still in shutdown mode is political and fear tactics! FYI, at the ventilators to the list and hospitals get \$39,000+!! For the rest of hardworking, freedom-loving America — it's time to reel in the radically unconstitutional! If you're going to dance on someone's constitutional rights, you better have a good reason! Sheltering in place decreases your immune system. This is immunology — microbiology 101. This is the basis of what we've known for years: When you take human beings and you say, 'Go into your house, clean all your counters, Lysol them down' ... what does it do to our immune system? You know in your heart what the answer is."</p>
Virus origins	Descriptions or claims about the source of the virus	48 (14.41%)	<p>"Really Think Corona Came From Bats?"</p> <p>#drjudymikovits #coronavirus #batvirus #i#infectedanimals #drbaker #howlongcoronahasbeenaround #beenaroundforcenturies</p> <p>Corona didn't come from bats? Dr. Judy Mikovits explains! For the full interview click link: https://youtu.be/R0Tu8XYpQQ0</p> <p>For more censored content please subscribe to my email list: https://www.drstevenbaker.com</p> <p>To buy Dr. Judy's book ""The Plague Of Corruption"" click link: https://www.amazon.com/Plague-Corruption-Restoring-Promise-Science-ebook/dp/B07S5H6T4Q/ref=sr_1_1?crid=1EF9M7PX6DLV3&dchild=1&keywords=the+plague+of+corruption+book&qid=1588288768&sprefix=the+plague+o%2Caps%2C206&sr=8-1 -oCorona no vino de los murci√@lagos? -oLa Dra. Judy Mikovits explica! Para el enlace completo de clic de la entrevista: https://youtu.be/R0Tu8XYpQQ0</p> <p>Para obtener m√s contenido censurado, suscr√/bete a mi lista de correo</p>

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Table 1 (continued)

Coding Categories	Definition	N (%)	Example Tweet
Virus information	Descriptions of the characteristics of the virus, or how the virus is transmitted	34 (10.21%)	<p>electr√≥nico: https://www.drstevenbaker.com/spanish Para comprar el libro de la Dra. Judy ""La plaga de la corrupci√≥n"" haga clic en el enlace: https://www.amazon.com/Plague-Corruption-Restoring-Promise-Science-ebook/dp/B07S5H6T4Q/ref=sr_1_1?crid=1EF9M7PX6DLV3&dchlid=1&keywords=the+plague+of+corruption+book&qid=1588288768&sprefix=the+plague+o%2Caps%2C206&sr=8-1</p> <p>"This interview is ideal for everybody on any level who wants to learn the truth about the Covid-19 PLANDEMIC, viruses, germ theory and how viruses are NOT IN FACT CONTAGIOUS. This is a scientific fact that has been kept from people in order to control them for centuries and Dr. Kaufman also discussed how TOGETHER we can break this spell.</p> <p>This interview is from early March, the title card from April. It has been banned all over the world and it has been buried on this channel for months so I am reposting it in it's entirety because of how important it is. You can now also find it and other illuminating videos at Davidicke.com under: VIRUS Video Package for London Real Viewers.</p> <p>I simply cannot recommend this interview enough. If you watch only one video on this channel, please make it this one and give it at least 10–15 min. I assure you it gets better and better as the interview goes on. You'll also find a lot more videos and posts like these if you dig back on this channel a ways.</p> <p>Also I've spliced in a little extra background on Dr. Kaufman from a different interview for added background. . (Update:There is a new Andy Kaufman Video available now on londonreal.TV/Kaufman which has more updated stats than this does, but this one still remains the best in my opinion)</p> <p>#DrAndrewKaufman #protest #wedonotconsent #notmyvirus #Icantbreath #blacklivesmatter #endthelockdown #flattenthecurve #WeAreTheNewsNow #wwg1wga #londonrealarmy #maga #unbearables #candiceowens #nonewnormal #digitalsoldiers #tuckercarlson #fuckBillGates #firefauci #Vaccines #billgatesisevil #BIGPHARMA #DrButtar #virusesareNOTcontagious #vaccines #DrJudyMikovitz #hoax #falseflag #PlandemicMovie Follow my backup @trueearth2'</p>
Economic impact	Descriptions or claims about the economic impact of COVID-19, such as job losses, business closure, or economic downturn	4 (1.2%)	<p>"Cigarettes kill over 10 million people a year!!! Over 1 million people Die from second hand smoke!!! Yes they die from the choice of others Alcohol is the cause of 5.3% of all deaths worldwide yes 5.3% Alcohol and drug addiction costs the US economy 600billion yearly!! The worldwide figure If you dont know the damage junk food is having on your body you are ignorant as hell!! Cancer diabetes heart disease the list goes on!! Hundreds of thousands of people die each year from pharmaceutical drug over dose and medical malpractice is the 3rd leading cause of death!!! But you guys keep wearing your mask sanitising your hands and believing the government want to save your life!! Repost @sharing_love_and_health Why are the government pushing a vaccination and not healthy lifestyle??? The money is in the medicine The government and the pharmaceutical industries worst nightmare is a healthy world They need you to be sick Vaccinations are a billion dollar business!! In just 6 years they went from profits of 30billion to 60billion If the covid19 vaccination is mandatory triple that figure if not more You are more likely to get sick from a vaccination than you are to die from the virus!!!! Tyrannical rule has always been here and now we need to stand against that!! You are a human being with the right to your own body and you should never be forced to take anything against your will EVER #saynotobillgates #fuckbillgates #plandemic #health #healthyliving #cigarette #cancer #covidhoax #covid19 #virusscam #wakeupworld #vaccination #money #nonewnormal #wakeup #research #question #agenda21 #event20 #arrestbillgates #sheeple #timforchange #itsbuisness #nothealthy #crimesagainsthumanity #getup #standup #standupforyourrights #tyranny"</p> <p>"Lockdown Supporters should go tell domestic violence victims and child abuse victims as well as children and families who have no food, no electricity and can not pay their mortgage or rent just how much the lockdown made them feel safer ... https://www.nytimes.com/2020/04/06/world/coronavirus-domestic-violence.html #NoNewNormal #SayNoToBillGates #plandemic #scamdemic #fuckyourvaccine #plannedemic #scamdemic #constitution #thisisamerica #thisisntchina #truth #humanrights #freedom #usa #globalfearenterprises #takeamericaback #cannabiscommunity #cannabis #rebel #freedomisntfree</p>
Social impact	Descriptions or claims about the social impact of COVID-19, such as domestic violence, inequality, or discrimination	39 (11.71%)	<p>"Lockdown Supporters should go tell domestic violence victims and child abuse victims as well as children and families who have no food, no electricity and can not pay their mortgage or rent just how much the lockdown made them feel safer ... https://www.nytimes.com/2020/04/06/world/coronavirus-domestic-violence.html #NoNewNormal #SayNoToBillGates #plandemic #scamdemic #fuckyourvaccine #plannedemic #scamdemic #constitution #thisisamerica #thisisntchina #truth #humanrights #freedom #usa #globalfearenterprises #takeamericaback #cannabiscommunity #cannabis #rebel #freedomisntfree</p>

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Table 1 (continued)

Coding Categories	Definition	N (%)	Example Tweet
Types of Misinformation			#veterans #openamerica #coronavirus #endthelockdown #plandemic #childabuse #domesticviolenceawareness"
Satire or parody	No explicit intention to cause harm but has the potential to be misleading.	15 (4.50%)	"Below are health experts you can search for across any and all platforms that will explain it all very clearly to you so you can stop living in mindless fear. You'll also find many of their clips on this channel if you dig. . Dr. Andy Kaufman Dr. Sebi Dr. Shiva Ayyadurai Dr. JohnBergman Dr. Stefan Lanka Tom Barnett James True Antoine B√@champ Spacebusters - bitchute only. . . #DrSebi #virusesareNOTcontagious #yourbeingliedto #wakeup #unbearables #notmyvirus #wakeup #SocialDistancing #filmyourhospital #fearisthevirus #healthandwellness #feartactics #digitalsoldiers #coronavirus #corona #covid #plandemic #unbearables #coronavirusoutbreak #mindfulness #pandemic 2020 #coronaviruspandemic #coronavirus #covid ##yoga #stopthespread #healthyliving #wearethenewsnow #citizenjournalist"
Manipulated content	Content which includes original content or information that has been manipulated to form misinformation, such as: Misuse of facts or statistics, genuine content is shared with false contextual information, or genuine information or imagery is manipulated to deceive, e.g. deepfakes	143 (42.94%)	"Reposted from @svisionfamily2 Coronavirus has always come from a strain of the cold family, till political influence & msm turned into a plandemic false narrative. From false positive testing in the 80.33% https://pubmed.ncbi.nlm.nih.gov/32133832/ Results: When the infection rate of the close contacts and the sensitivity and specificity of reported results were taken as the point estimates, the positive predictive value of the active screening was only 19.67%, in contrast, the false-positive rate of positive results was 80.33%. Oxygen deprivation; hypercapnia, or breathing too much carbon dioxide, is a threat too your health as well. Covid-19 virus particle size averages 125 nm (0.125 μm); the range is 0.06 μm to 0.14 μm; one needs an electron microscope to see a covid-19 virus particle. Recommendations about masks can easily get confusing, because all masks are not made equal. The N95 mask effectively prevents viral spread. These masks, when properly fitted, seal closely to the face and filter out 95% of particles 0.3 μm or larger. But N95 masks are in serious shortage even for medical professionals. - #regrann - #regrann"
Fabricated content	Content is made up and false; designed to deceive and do harm	59 (17.72%)	"Dr. Judy Mikovits says 50 Million will die in the United States from Covid Vaccine, Dr. Sherry Tenpenny agrees, listen to what they even say about Bill Gates. #lexit #blexit #covid_19 #freedom #usa #america #novaccine #deepstate #democratsdestroyamerica #latinos #hispanics #billgatesisevil #maga #kaga #nyc #wakeup #openyoureyes"
Both manipulated and fabricated content	Content features a mix of fabricated and manipulated content.	116 (34.83%)	"This interview is ideal for everybody on any level and will reveal the true nature of Covid-19, viruses, germ theory, how viruses are NOT contagious, the plandemic and how TOGETHER we break this spell they are using to control us. . This interview is from March and been banned all over the world so I have been searching for it for weeks. You can find it and other wonderful videos now at DavidIcke.com under: VIRUS Video Package for London Real Viewers. . I simply cannot recommend this interview enough. If you watch only one video on this channel, please make it this one. . .#DrAndrewKaufman #viruseareNOTcontagious #protests #wedonotconsent #reopenamerica #reopennyc #reopencalifornia #tyranny #filmyourhospital #notmyvirus #givemelibertyorgivemedead #endthelockdown #flattenthecurve #WeAreTheNewsNow #opencalifornia #openamerica #operationgridlock #londonrealarmy #maga #constitution #candiceowens #openamericanow #yoga #endmedicaltyranny #nonewnormal #digitalsoldiers #tucker Carlson #fuckBillGates #firefauci"
Imposter content	Impersonation of genuine sources, e.g. news outlets or government agencies, e.g. links with the misspelling of organization, design of webpages or graphics that closely resembles the designs of the genuine source	0	/

Sources of Misinformation

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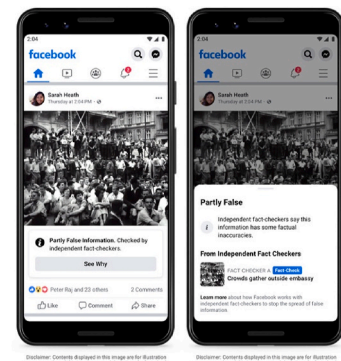
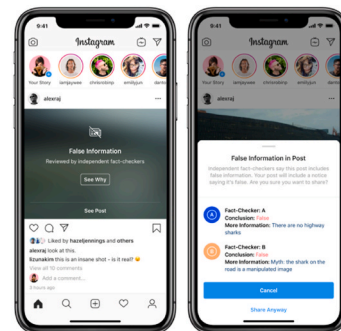
Table 1 (continued)

Coding Categories	Definition	N (%)	Example Tweet
Prominent person/ source	Prominent sources may include politicians, celebrities, well-known experts, popular figures, or news sources	95 (28.52%)	Account: Trump 2020
Non-prominent person/source	Posts published by non-prominent person/source	156 (46.85%)	Account: Conscious_god
Source was removed/ missing	Unable to find the source of the post	82 (24.62%)	Account: Empty
Emotions of Misinformation			
Neutral	Post simply state news and information without expressing positive or negative emotions.	160 (48.05%)	<p>"Watch @doctor.mike fact check that viral, Plandemic, conspiracy theory video #conspiracytheory #plandemic #debunked #nurseproud #nurselife #nursesrock #nursestrong #nurses #nursesofinstagram #rnlife #Stayhome #nursesofinstagram #nurselife #coronavirus #coronavirusnurses #nursesonthefrontlines #nurseproud #nursesonthefrontline #socialdistancing #thenewnormal #covidnurses #nursestrong"</p>
Blame/anger	Post attacks a person or a group or accusation towards a person or a group. The post might express indignation that such a pandemic could happen.	68 (20.42%)	<p>"Trump is not going to save you and Q is for Quarantine - GROW UP! Superhero's are for children and it's waaay past time you put away your childish things. While your spending your time looking at WikiLeaks, virtue signaling your various political views and debating celebrity affiliations, your freedoms are being conquered and decimated and they will never return. Put down your playthings and pay attention to what's going on in the Here and Now. Your precious Trump is PRO VACCINE for a virus that doesn't even exist! (Mic drop) Please stop focusing on sewers and mysterious children and how pedophiles are being arrested while 100 times the amount have been released from prison. You are a subset of some of the smartest people out there and we need all hands on deck right now fighting real issues, not imaginary ones. If Q or Trump are actually on our side they would agree 100% with this post! In fact, they literally have said dozens of times it's up to US.</p> <p>There is no more red versus blue or Q versus the Clinton's there's only US versus them. We've all been played!</p> <p>Watch Rose/Icke 3 at londonreal.tv or your uninformed.</p> <p>#qanon #qtards #trusttheplan #q #coronavirus #lockdown #truthseekers #covid19 #plandemic #protests #wedonotconsent #reopenamerica #tyranny #notmyvirus #operationgridlock #smallbusiness #givemelibertyorgivemedeth #endthelockdown #lockdown #flattenthecurve #WeAreTheNewsNow #maga #knowyourrights #tucker Carlson #endmedicaltyranny #nonewnormal #digitalsoldiers"</p>
Hope/caring	Post proving social support, offering sympathy for victims, friends, families or others Post might include thoughts or prayers for the victims	0	/
Fear/anxiety	Post about death and uncertainty of the future/economy that will reflect fear/anxiety	17 (5.00%)	<p>If you are a parent and you are actually WILLING to send your kid to indoctrination camps (aka School) and ALLOWING this form of brainwashing to occur, let me remind how god awful of a parent you are, and how you are contributing to the demoralization of a new generation, that will be enslaved by a Future Dictatorship.</p> <p>When in your lifetime have you ever been programmed in school with children books to always keep your face covered and hide your identity? Never ... C0vid is nothing but a Trojan horse to slowly establish a Dystopian One World Dictatorship and strip away your Identity, to be nothing but a bot in their system, that knows how to take orders, fall in line, and move or stay when told. ùŹñ If a Contagion actually existed, everyone would be dead, since nobody is constantly disinfecting door handles, car doors, store products, etc, or disposing their masks in Biohazard bins. Better yet, what about the people who work jobs that come in contact with hundreds of people a day and have no health issues? It appalling how parents actually tolerate this nonsense, and do nothing about it. This PL4NDEMIC just shows how soft and weak willed everyone actually is, and how everyone nowadays just goes along to get along, regardless of what future consequences it may hold. Just remember, you can hide from reality all you want, but you cant run from the consequences of hiding from reality. I even see parents screaming, Save The Children, but sending them to school with masks lol</p> <p>Follow these shadowbanned truth pages: @iamnadiasavage @red_pill_spill @erich_alphabet @lepetersworld @iam.reverence @psyopsurvivor @holistic.nomad2 @taniatheherbalist @at.lastthemav @operation.wake.humanity #plandemic #awakening #sheeple #nwo #newworldorder #society</p>

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Table 1 (continued)

Coding Categories	Definition	N (%)	Example Tweet
Happiness/joy/celebration	Post reflects happiness and joy despite the pandemic, and/or illustrate people coming together to celebrate certain milestones despite COVID-19	5 (1.50%)	<p>#flatearth #truth #vaccines #owo #spirituality #God #illuminati #government #media #bigpharma #world #quarantine #lockdown #psypop #5G #covid19 #coronavirus #wakeup #spiritualawakening #oneworldorder #health #wellness #fakenews #healthcare</p> <p>"In these unprecedented times of global upheaval, we are being given an opportunity to heal the broken aspects of ourselves and the world around us by bringing loving awareness to it. But first we must be willing to see it, to face it, in order to love it into the wholeness we all desire and deserve. It is a time to be brave and true and trust in and act out of the goodness that exists within each and everyone of us.</p> <p>Thank you my dear friend, @MikkiWillis and your Elevate team for your devotion to truth, and for your willingness to stand up for the rights of all people to see what exists and to choose the course of their own lives and the lives of their loved ones.</p> <p>Thank you to the millions of individual truth seekers and your willingness to prevail through the censorship, to look up and see, to dig up all possibilities and share with one another your findings. For you are paving the way for the rights of ALL people to choose, even if differently than you.</p> <p>Thank you @therealbrianrose for having the courage to, in the face of such aggressive technological bullying, create a platform dedicated to the sharing of ideas, knowledge, and experience, leaving judgement to that of the many who comprise your audience.</p> <p>and Thank you my followers, fans, friends and family for your willingness to LOVE along side me, with me, through me or even in spite of me. This single choosing will make us whole.</p> <p>#unity #love #covid19 #health #freedom #plandemic 2020 #coronavirus @askrsb"</p>
None of the above	No emotion could be discerned	83 (25.00%)	"This documentary is a reupload. #plandemic #woke #awakening #"
Fact-checking by Facebook	Nothing was flagged	114 (34.23%)	/
Flagged as false information	Content that has no basis in fact	48 (14.41%)	



Disclaimer: Content flagged in this image will be displayed to users only and this is not an actual depiction of a factcheck.

(continued on next page)

Table 1 (continued)

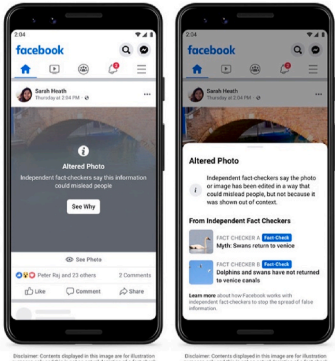
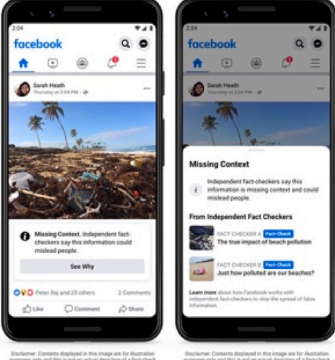
Coding Categories	Definition	N (%)	Example Tweet
Flagged as altered	Media content edited beyond adjustments for clarity in a misleading manner	36 (10.81%)	
Flagged as missing context or was deleted	Content that may mislead without additional context.	17 (5.10%)	
Post was set to private, or was deleted	Content not accessible by coders	6 (1.80%)	/

Table 2
Intercoder reliability scores.

Category	Cohen Kappa
Misinformation	.81
Themes of Misinformation	.66
Types of Misinformation	.70
Sources of Misinformation	.84
Emotions of Misinformation	.71
Fact-checking by Facebook	.81

Table 3
Negative binominal regression results.

	Beta	95% Confidence Interval	
		Lower Limit	Upper Limit
Themes (Reference = Public authority personnel, action or policy)			
Private firms	.28*	.05	.50
Treatment and prevention of virus transmission	.51***	.24	.77
Diagnosis and health impacts	.43***	.18	.67
Virus origins	.41*	.12	.71
Virus information	-.02	-.27	.23
Economic impact	-.21	-.42	.01
Social impact	.46***	.19	.72
Types (Reference = Satire or parody)			
Manipulated content	-.28	-.82	.26
Fabricated content	-.09	-.56	.38
Both manipulated and fabricated content	-.52	-1.05	.01

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Table 3 (continued)

	Beta	95% Confidence Interval	
		Lower Limit	Upper Limit
Themes (Reference = Public authority personnel, action or policy)			
Imposter content	–	–	–
Emotions (Reference = Neutral)			
Blame/anger	.15	–.08	.39
Hope/caring	–	–	–
Fear/anxiety	.04	–.18	.25
Happiness/Joy/Celebration	–.08	–.29	.13
None of the above	–.43***	–.66	–.20
Sources (Reference = Originated from prominent person or source)			
Non-prominent person/source	–.18	–.52	.16
Source was removed/missing	–.15	–.50	.20
Fact-checking by Facebook (Reference = Nothing was flagged)			
Flagged as false information by Facebook	.39**	.16	.63
Flagged as partly false information	–.31**	–.53	–.10
Flagged as altered	–.21	–.42	.01
Flagged as missing context	–.17	–.38	.04
Post was set to private, or was deleted	–.10	–.31	.12

Note. *: $p < .05$; **: $p < .01$, ***: $p < .001$.

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