20

Infodemic: How Has the Epidemic of Misinformation Affected the Response to COVID-19?

Series | COVID-19 & response strategy

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[This is the twentieth document in a series of discussion notes addressing fundamental questions about COVID-19 and response strategies. These documents are based on the best scientific information available and may be updated as new information comes to light.]

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Photo: Mònica Moreno / Barcelona City Council

Misinformation has played an important role during the COVID-19 pandemic. A general public desperate for reliable data and a scientific publishing industry still characterised by many features of the Gutenberg era have contributed to a parallel pandemic: an **infodemic**. The term *infodemic* refers to an overabundance of information—some accurate, some not—on a particular subject. The World Health Organisation (WHO) has long used this term to describe an excess of information about a topic, including many hoaxes or rumours, which make it difficult to find reliable sources and guidance.

Most aspects of the COVID-19 debate have been burdened by this infodemic. Examples on the therapeutic front[1] include the **rise and fall of hydroxychloroquine** and the promotion of **diluted bleach as a treatment—both largely fuelled by the personal endorsement of the president of the United States**—as well as the inclusion of ivermectin in the national therapeutic guidelines of Peru and Bolivia on the basis of *in vitro* experiments and fraudulent data[2].

Other critical areas where false or misrepresented information has played a role during this pandemic include the **debate around the protection of children** during confinement, the **use of face masks** and the actual level and duration of **immunity to the virus**. This epidemic of misinformation has been exacerbated by rushed scientific publication, the prioritisation of partisan activism over evidence, and a general excess of opinions and deliberately misleading information in a context of data scarcity. The infodemic poses risks to both the response to COVID-19 and the opportunity to consolidate better practices for the future ●

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[1] Saitz R, Schwitzer G. Communicating Science in the Time of a Pandemic. *JAMA.* 2020; 324(5):443–444.

[2] Chaccour C. Ivermectin and COVID-19: How a Flawed Database Shaped the Pandemic Response of Several Latin-American Countries. ISGlobal. 29 May 2020.

1. The Haste of a Pandemic

"With journals overwhelmed, the scientific community turned to pre-prints—manuscripts posted to online repositories without peer review—with the genuine intention of rapidly sharing useful knowledge. This approach accelerated dissemination but did not ensure quality."

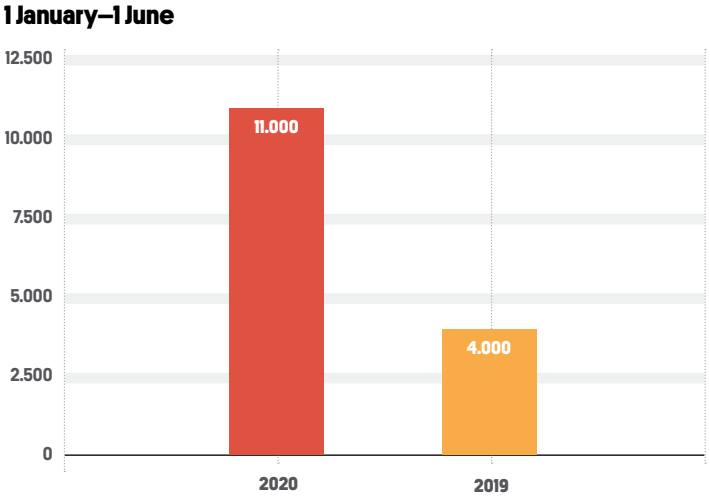
Scientific journals play a key role in the dissemination of knowledge. They generally serve as guarantors of the trustworthiness and quality of the material they publish. To do this, they rely on the peer-review process, in which other scientists—i.e. peers—review manuscripts before the editors make a final decision on the basis of the reviewers' comments. This process, however, is not flawless, nor is it designed to spot fraud or misconduct. In fact, the process itself can contribute to misinformation due to profound intrinsic issues that arise from today's scientific publishing business and the use of its products by the media and the general public.

1.1. Pressure on Journals

The scientific community has rushed to conduct life-saving research on the novel coronavirus at an **unprecedented speed**: the first genome sequence of the virus was published just 11 days[3] after the first cases were officially reported to the WHO. The rapid emergence of knowledge on the virus (SARS-CoV-2) and the disease (COVID-19) quickly overwhelmed the capacity of the publishing industry to assess manuscripts and publish papers.

One prominent journal, ***JAMA***,[4] saw its **submissions increase by nearly 300%** (11,000 submissions in six months) (Figure 1). For the first few months of the pandemic, an average of 367 COVID-related articles were published per week, with a median time from receipt to acceptance of just six days[5]. Nevertheless, reconciling this enormous volume with high quality and fast dissemination is a difficult task. There was a paradoxical and urgent need to slow down and safeguard quality at the expense of speed[6]. Public trust in science was at risk[7].

Figure 1. Number of Manuscripts Submitted to *JAMA* during the Pandemic.



[3] Zhang YZ, Holmes EC. A Genomic Perspective on the Origin and Emergence of SARS-CoV-2. *Cell.* 2020; 181(2):223:227.

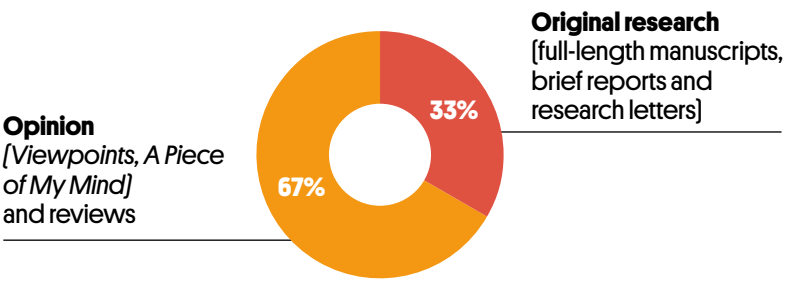
[4] Bauchner H, Fontanarosa PB, Golub RM. Editorial Evaluation and Peer Review During a Pandemic: How Journals Maintain Standards. *JAMA.* 2020; 324(5):453–454.

[5] Palayew A, Norgaard O, Safreed-Harmon K, Andersen TH, Rasmussen LN & Lazarus JV. Pandemic publishing poses a new COVID-19 challenge. *Nature Human Behaviour.* 2020; 4:666-669.

[6] Publishing in the time of COVID-19. Editorial. *The Lancet Global Health.* Volume 8 July 2020.

[7] Bauchner H, Fontanarosa PB, Golub RM. Editorial Evaluation and Peer Review During a Pandemic: How Journals Maintain Standards. *JAMA.* 2020;324(5):453–454.

Manuscripts focused on COVID-19



Source: Bauchner H, Fontanarosa PB, Golub RM. Editorial Evaluation and Peer Review During a Pandemic: How Journals Maintain Standards. *JAMA*. 2020;324(5):453–454.

1.2. Pressure on Scientists

With journals overwhelmed, the **scientific community turned to pre-prints**—manuscripts posted to online repositories without peer review—with the genuine intention of rapidly sharing useful knowledge. This approach accelerated dissemination but did not ensure quality. Pre-prints require that the academic community expend additional effort to **discern between rigorous and less-rigorous experiments and interpretations**. Many scientists have been lured by the sudden availability of funds for COVID-19 research[8].

Furthermore, the pandemic has exacerbated pre-existing **job instability and precariousness in academia**[9] especially for those most affected by it, including **female researchers**[10].

In short, it would not be fair to exempt **scientific institutions** themselves from responsibility for the infodemic. These institutions are cogs in a knowledge-generation system that needs **cooperation** more than ever but will never forget that it is built around **competition**. Consequently, in their communications, the very institutions called upon to provide responses have not always prioritised added value and the common good over the ambition of conquering positions more central than those occupied by their rivals.

1.3. Pressure on the Public

The general public is rightfully **full of questions** and demanding answers from scientists and policymakers. Unfortunately, the feeling of urgency among journalists and their audiences has prompted a rush to share new findings and hypotheses, regardless of the quality of the underlying data. This misinformation, in turn, can rapidly lead to **anxiety and confusion among information recipients**.

In addition, the general public—and some journals—may **mix politics with science**, supporting or rejecting drugs and public health measures on the basis of where they stand in the political sphere. Activism is often placed before evidence. A clear example of this is the use of face masks in the United States[11]: many Republican-leaning people see masks as an attack on individual freedom, despite strong public health evidence supporting their efficacy in limiting viral spread

[8] Pai, M. Covidization of research: what are the risks? *Nature Medicine. 2020*; 26, 1159.

[9] Afonso A. How Academia Resembles a Drug Gang. The London School of Economics and Political Science Blog. 2013.

[10] Gewin V. The Career Cost of Covid-19 to Female Researchers, and How Science Should Respond. *Nature*. 2020.

[11] Aratani L. How did face masks become a political issue in America? *The Guardian*, 21 June 2020.

2. Consequences of the Urge

"The rush to produce results has led to some flawed and even fraudulent studies making it into very prestigious journals, with immediate consequences."

The rush to produce results has led to some flawed and even fraudulent studies making it into very prestigious journals, with immediate consequences[12]. A **large observational study** published in *The Lancet* in May 2020 **showed that hydroxychloroquine did not benefit (and even harmed) COVID-19 patients**. Within 48 hours, the WHO-sponsored Solidarity trial put their hydroxychloroquine arm on hold. Funders and scientists around the world made decisions based on the report. But the data used in the study was never made public by its owner, a now-defunct company called Surgisphere[13]. A previous report based on the same dataset and published in the *New England Journal of Medicine* influenced how doctors prescribed cardiovascular drugs to COVID-19 patients. Both papers were **later retracted by the authors, not the journals**.

This scandal has had profound consequences for the credibility of science, just when we need it the most. It has affected funding decisions and contributed to divisions among scientists as well as between scientists and the general public, sometimes on the basis of political disagreements or differences of opinion rather than scientific views.

None of this is new. Retractions, data fabrication and hugely controversial research happen all the time. A highly flawed paper associating the MMR vaccine with autism, published by *The Lancet* in 1998, greatly contributed to the anti-vaccine movement. Twelve years passed before the journal fully retracted the paper.

The Surgisphere database also contributed greatly to the use of an antiparasitic drug for the treatment and prevention of COVID-19 in the Americas[14]. Thousands of people were injected with a veterinary formulation of the drug[15], speculation drove prices up and medicines were counterfeited—all as a result of the **ivermectin infodemic in Latin America**[16].

[12] García-Basteiro A. Without Rigor and Transparency, There Can Be no Science: about Surgisphere and its Scientific Publications in High Impact Journals. ISGlobal, 3 June 2020.

[13] Gabler E, Rabin RC. The Doctor Behind the Disputed Covid Data. *The New York Times*. 28 July 2020.

[14] Chaccour C. Ivermectin and COVID-19: How a Flawed Database Shaped the Pandemic Response of Several Latin-American Countries. ISGlobal. 29 May 2020.

[15] Fowks J. Un grupo evangélico peruano inyecta un medicamento veterinario a miles de personas para la Covid-19. *El País*. 19 June 2020.

[16] Rueda A. ¿Es peligroso automedicarse con ivermectina? *Salud con Lupa*. 21 July 2020.

3. The Role of Social Networks and the Media

"Unlike traditional media outlets, social media companies have no editorial authority over the messages expressed on their platforms, nor do they have any accountability."

3.1. A Double-Edged Sword

The Surgisphere crisis was initially handled in a very academic way, which typically involves letters being written to editors or authors and responses being published a few months later. But the sense of urgency in this pandemic led to **many people sharing their criticism on social media**. The **pressure mounted by the public and the traditional media** very likely played a key role in reducing the retraction time from 12 years for the infamous MMR paper to just 14 days for the Surgisphere report in *The Lancet*.

Social media acts as a **double-edged sword** in this pandemic and other crises. On the one hand, it has been extremely useful in promoting debate within the scientific community, sharing criticisms of flawed data or papers, and disseminating useful results quickly. On the other hand, it has also helped to disseminate conclusions from flawed studies and deliberately spread misinformation. **Unlike traditional media outlets, social media companies have no editorial authority over the messages expressed on their platforms, nor do they have any accountability**. They only have the capacity to filter—a very modest power compared with the impact they can have when circulating misleading news that lack evidence or are simply fake. Through the use of algorithms that spread information faster and more easily than the virus, social networks have become one of the core sources of infodemics.

Despite promises by Facebook to use "strong warning labels" when fake news is detected, the campaigning organisation Avaaz analysed over 100 pieces of misinformation shared on the network[17]—all rated false or misleading by reputable, independent fact-checkers—and found that they had been **shared on Facebook over 1.7 million times without any warning and viewed an estimated 117 million times**. And this is just the tip of the misinformation iceberg.

Figure 2. Analysis of Over 100 Pieces of Misinformation Content on Facebook.

Virus-related content in six different languages that was rated false and misleading by reputable, independent fact-checkers.

Shared

over 1.7 million times

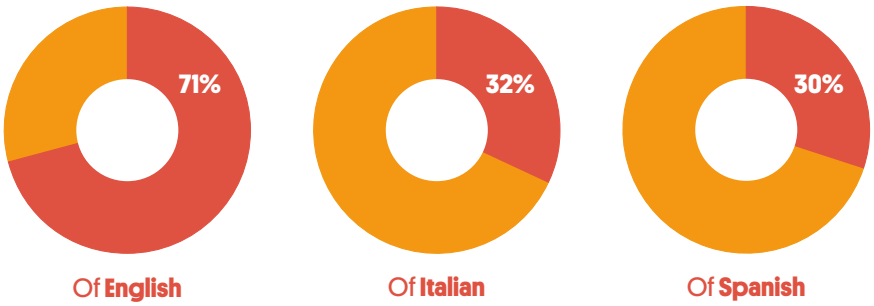
Viewed

an estimated 117 million times

Days it took the platform to downgrade and issue warning labels: up to 22

[17] How Facebook can Flatten the Curve of the Coronavirus Infodemic. *Avaaz*. 15 April 2020.

Warning labels on such content already issued by Facebook:



Source: How Facebook can Flatten the Curve of the Coronavirus Infodemic. Avaaz. 15 April 2020.

In times of uncertainty, **misleading posts are far more popular than those which provide accurate public health information**. Eating sea lettuce or injecting disinfectant or bleach—all false medical claims—are perceived as potential solutions for those who want to minimise potential harms. People tend to get information from a variety of sources, not all of which are necessarily reliable. Social networks have revolutionised the way people communicate. They have made it much easier to form "**opinion tribes**"—tight groups of people who share ideas, values and selective information. These network nodes make it easier to establish group opinion, concretise narratives and identify enemies. At the same time, **the discourse in these tribes can also be more radicalised**. Their members, who share similar concerns and values and are reassured by a sense of group belonging, may become willing to embrace morally unacceptable proposals. The main problem is that **community perspective is lost** and the group's interest is perceived as the only legitimate one.

3.2. Politically Motivated Fake News

Some of the **fake news** about COVID-19 circulating on social networks seems to be **politically motivated**. This was clearly true in the case of the **conspiracy theory** about the "artificial" origin of the virus as a failed biological experiment. When the news said that the virus came from Wuhan, it was clearly a way for the United States to discredit China; when the Chinese said that the virus came from abroad, it was an attempt curry favour with their own public in the opposite direction. At the peak of the pandemic in March, a survey[18] by the Pew Research Center found that **one in four Americans believed that COVID-19 was made in a lab and almost half of the population was not sure**.

Networks like Twitter, Facebook and WhatsApp create group communication. It becomes **very easy to keep a group's messages away from any critical perspectives and avoid confrontation from outside** the "circle", making it more feasible for political groups and interests to maintain their predominant narrative and cohesion. Moreover, misleading information has a much harder time getting through the filters of traditional media, so social networks become **the perfect—and sometimes only—channel for multiplying the impact of these messages**.

3.3 The Media

The media have played an essential role in spreading information and informing the public about preventive measures. At the same time, however, they have been a key player in the infodemic. Just as much of the scientific community set aside their previous research topics to focus on studying SARS-CoV-2, the **boundaries between the different sections** of the media became more blurred and many journalists, regardless of their background or previous experience, turned their attention to reporting on the pandemic. At critical moments during the first wave of illness, even the sports media reported on COVID-19.

At the same time, the pressing need for answers and the lack of scientific evidence

[18] Schaeffer K. A look at the Americans who believe there is some truth to the conspiracy theory that COVID-19 was planned. Pew Research Center. 24 July de 2020.

led to the **lionising of experts**, with the media whipping itself into a frenzy in search of authoritative voices. However, finding experts on a virus that was unknown to science before December 2019 proved to be a challenge.

The dynamics of the media and the economics of the media business have led to the proliferation of **debate programmes, which are cheaper to produce than investigative journalism**, generating a confusing barrage of opinions that sometimes blurs the line between political opinion and scientific evidence. While this approach may increase viewership, it also generates more **noise**.

As a consequence of this hunger for answers, in the first six months of the pandemic, **ISGlobal's Communications team** arranged more than 600 interviews and racked up more than 8,000 media hits.

This **unprecedented media coverage** took place in real time and at breakneck speed in a context where rigour is valued—although not as much as **immediacy**—and the time and resources that would be necessary to prepare **in-depth** analyses or **corroborate** opinions and facts are typically unavailable ●

Box 1. The Vaccine War.

The vaccine war is one of the biggest issues in this pandemic. Certain groups have taken advantage of the intense social media traffic associated with coronavirus-related trending topics to disseminate their own propaganda. The anti-vax movement has already started to mobilise globally against vaccine efficacy and safety, before any vaccine has been fully developed and tested. The resulting misinformation **impacts millions of people**, fuelling an increase in vaccine hesitancy that could lead to a massive public health problem when a vaccine[19]. finally does become available. Social networks like Facebook use algorithms that replicate and promote negative and conspiratorial news, which become trends on the network. Pages that include this sort of content increase their impact and follower count and can later be used for other purposes. At the same time, Facebook profits from the rise in traffic and the consequent increase in resources.

[19] Vaccine confidence surveys published to date suggest that a lack of public trust in vaccines is a risk that should not be underestimated. A survey published in August found that 30% of Spaniards expressed scepticism regarding vaccines against the coronavirus.

4. Conclusions and Recommendations

"The COVID-19 infodemic has damaged public trust in science, but it is also an opportunity to review the methods used to communicate science in order to increase transparency and perhaps transform the business model from one that enormously benefits publishers to one that benefits science itself."

The COVID-19 infodemic has damaged public trust in science, but it is also an opportunity to review the methods used to communicate science in order to increase transparency and perhaps transform the business model from one that enormously benefits publishers to one that benefits science itself.

Action is needed at four different levels:

a) The **scientific community** must review the way it engages with the general public. Now more than ever, there is a clear need for transparency and the use of language that is accessible to everyone. The message that rigour is fundamental to research is key, even in times of urgency.

b) Journals now have an opportunity to revisit their business models and reflect on how they shape academic work and research in general. It is time to abandon the vices acquired during times when printed communications were the norm. Science dissemination has become a very profitable business for private companies, perhaps against the interest of science itself.

c) Social networks need to detox their algorithms to downgrade pages, groups and domains belonging to misinformation accelerators and keep harmful content out of their traffic. **This is not censorship**; it is preventing fake news from reaching users. The authorities, the scientific community and the people responsible for social networks must also remember the importance of quickly filling the information void with trusted sources of information, as **Google** started to do early on in the pandemic by **allowing only trusted information on its search engine**.

d) We all must help to produce and disseminate quality information, while at the same time avoiding rumours and scandals that will only fuel the parallel infodemic

Box 2. Five Tips to Combat Fake Science News in the Age of Coronavirus.

1. Look beyond the headline. It is important to review the details.

2. Find the original source. Identify the study cited by the article and take a look at it. Be particularly critical of articles based on pending studies.

3. Treat very surprising claims with scepticism. Sometimes the news surprises us because we lack in-depth knowledge of a subject.

4. Double-check the information. Do a search to see if you can find the same news on other websites or media.

5. Do not forward or disseminate information that you have not critically appraised. Don't retweet or forward a WhatsApp message without having reviewed the information.

Source: 5 tips to combat scientific fake news in times of coronavirus. El·lipse. Barcelona Biomedical Research Park (PRBB). 22 July 2020.

TO LEARN MORE

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