Fake news and vaccination:
How the Science Anti-Fake News team in Argentina is fighting the infodemic

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Abstract

At the outset of the pandemic, it became clear that misinformation ("fake news") on COVID-19 was spreading rapidly. In this article, we discuss our efforts to combat misinformation by joining with researchers from various disciplines in Argentina to form the Science Anti-Fake News team. We highlight three examples of fact checks on vaccine misinformation that we conducted from October 2020 to July 2021 and provide evidence of their reach in our social media audiences. The article further discusses the manner in which misinformation spreads and the importance of "democratising" the availability of scientific knowledge in the context of the uncertainty provoked by the COVID-19 pandemic.

Introduction

In Latin America, the concept of "fake news" has been popularised through a literal translation of the English "false information". Fake news is content that does not have an objective basis but is presented as news. Allcott and Gentzkow define it as "news articles that are intentionally and verifiably false, and could mislead readers".[1] Other experts classify it as information specially designed to misinform, deepen prejudices, and cause political damage.[2] Although there is no unique definition, we define it here as misleading information disseminated through information technologies – such as press, television, radio, websites, and social media – with the aim of misinforming people and even inducing certain opinions and behaviours. Of note, although it may have been created with the intention of misinforming, some people who are victims of such misinformation unfortunately contribute to its spread.

"Fake news" has increased significantly since the outbreak of the COVID-19 pandemic. Some studies and surveys show an exponential rise in the dissemination of fake news on epidemiological and immunological issues.[3] As communication analysts notice, this phenomenon is probably linked to the uncertain context in which we are living. The feeling of vulnerability leads to the search for certainties and truths, which can reinforce previous convictions or what is called "confirmation bias". Fake news contributes to crystallising individual preferences and prejudices and, especially, to exacerbating negative emotions.[4] In March 2020, when the COVID-19 pandemic had recently been declared, the World Health Organization (WHO) used the term "infodemic" – coined in 2003 by journalist and political scientist David Rothkopf – to refer to a swift and far-reaching spread of false or misleading information in digital and physical environments. According to the WHO, the infodemic "causes confusion and risk-taking behaviours that can harm health. It also leads to mistrust in health authorities and undermines the public health response".[5] Thus, scientists, journalists, and governments not only must help to contain the COVID-19 pandemic but also fight against the infodemic and its effects on people's behaviours.

As the term suggests, an infodemic is a worldwide phenomenon that affects diverse countries and regions, including South America.[6,7] In Argentina, fake news has been disseminated since the COVID-19 pandemic arrived. This fake news includes a panoply of topics, from misleading information about alternative treatments to cure the disease to conspiracy theories about the supposed dangers of vaccines. It is in this context that the Science Anti-Fake News team was born. Our team developed through the initiative of young researchers from various disciplines who wished to help with the struggle against fake news. This article recounts the experience of the Science Anti-Fake News team.

For this article, we concentrate on some fake news that spread at the beginning of the vaccination campaign in Argentina, more specifically, from October 2020 through July 2021. First, we analyse how misinformation is fabricated and spread, based on a set of fake news items that circulated in relation to the vaccines available in Argentina during this period. Second, we describe how the team refuted this fake news and how our activities impact on public opinion. Finally, the article highlights the importance of democratising scientific knowledge in the context of the uncertainty unleashed by the COVID-19 pandemic.

What is "Science Anti-Fake News"?

Motivated by a sense of social responsibility and worried about the COVID-19 outbreak and

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infodemic, the Science Anti-Fake News team became the first project focused on COVID-19 misinformation that was endorsed by the National Scientific and Technical Research Council of Argentina (known as CONICET, for its name in Spanish, *Consejo Nacional de Investigaciones Científicas y Técnicas).*[8] This group aimed to use scientific evidence to counterattack COVID-19 misinformation. The team is composed of 16 young scientific researchers and PhD students originally motivated by the emergence of viral fake news that threatened public and individual health. Dismantling fake news is not an easy task. When questions or fake news related to COVID-19 arrive at our social media accounts, the team checks the veracity of

the concerns by looking for evidence and consensus among scientific societies. Once verified by many members of our team, as if it were a peer-reviewing process, the information must then be written in an accessible language that can be understood by a non-specialist audience. Then, it is published on the ConfiAR website (a platform designed by the Argentine government to display verified information related to COVID-19)[9] and in our social media accounts on Instagram, Facebook, Twitter, and YouTube (see Box 1). Believing that good information should be available for everyone throughout our country, the group expanded to include an additional 12 researchers from other disciplines, including social communication,

political research, and anthropology, and from locations throughout Argentina. More than 300 checks have been carried out since the beginning of the pandemic.

Fake news and vaccination campaign

Fake news about science often consists of a mix of true and false statements. These items usually include technical language, refer to facts that could be true if considered in isolation, and sometimes include the testimony of public figures. In our experience, it is generally possible to identify those cases in which misinformation is the consequence of an error of interpretation. When this type of erroneous information is issued by the media, it is generally related to poor journalistic practices. The new technologies and the speed of the dissemination of information disrupt journalism work routines, modifying information priorities so that speed is prioritised over quality. We attribute most of the unintentional false information to this factor.

Science Anti-Fake News has endeavoured to counterattack misleading information linked to the vaccination campaign deployed in Argentina since October 2020. For this article, we are highlighting three examples of misinformation that occurred at different moments across the pandemic. These examples were chosen based on

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Box 1. Social media accounts of Science Anti-Fake News

Instagram: https://www.instagram.com/anti__fakenews/

Facebook: https://www.facebook.com/ciencia.anti.fake.news

Twitter: https://twitter.com/anti__fakenews?lang=es

YouTube: https://www.youtube.com/c/anti_fakenews

Note: Science Anti-Fake News has more than 30,000 followers on Instagram, 24,000 followers on Twitter, and 6000 followers on Facebook.

the level of social media engagement we saw for our fact checks and the number of requests we received from TV and radio stations for our team to provide clear, accurate (but not technical) scientific information about the topics.

How we dismantled three fake news items on vaccination

When encountering fake news or community concerns on COVID-19, we search for reliable scientific information on that topic. We mainly consult scientific peer-reviewed articles published online, although we may also search manuscripts posted on preprint servers. We use preprint manuscripts cautiously by specifying in our reports that the results have not been subject to peer review. Many times, misinterpretation of preprints have been used by digital media to make a statement that is not proven yet. So, when this is the case, we thoroughly analyse the cited preprint. Platforms such as PubMed, BiorXiv, MedrXiv, and SSRN (formerly known as the Social Science Research Network) are constantly being monitored to stay current with the latest information. We also look for guidelines from the WHO, the US Centers for Disease Control and Prevention (CDC), the European Medicines Agency, and COVID-19 guidelines from our local health authorities, especially on topics such as vaccination and treatments. Basically, we look for scientific consensus.

From our more than 300 fact checks, we selected three examples of fake news items to describe how we work and the impact of our efforts in our social media networks. In October 2020, when the first results of COVID-19 vaccine clinical trials were reported, misinformation began to spread that claimed that vaccines were going to change our DNA. This misinformation

Falso: un 30% de las personas vacunadas con Sputnik V en Argentina desarrolla efectos advertos graves.

False: 30% of people vaccinated with Sputnik V in Argentina developed serious side effects.

was particularly worrying as we were seeing it promoted by a group of health care workers and false experts; one of the interviews done had more than 24,000 plays on the RadioCut app. Not only did they spread misinformation on social media but also on TV and radio, taking advantage of the presenters' lack of knowledge on those topics. We reviewed scientific evidence, especially on WHO and CDC web pages,[10,11] related to whether there were any possible genetic alterations mediated by the newly developed vaccines.

Later, in December 2020, there was a misinterpretation of statements from Russian health authorities. One of them had suggested that people should not abuse alcohol after

vaccination with SputnikV. This was mis-interpreted by digital media, which claimed that people should abstain from alcohol for 42 days after the first SputnikV dose. This is an example of fake news that was promoted by digital media with alarmist headlines. When we saw such headlines, we looked for evidence related to vaccines and alcohol consumption and found that moderate alcohol consumption would not affect vaccine efficacy. Moreover, it should be noted that for any vaccines – not just SputnikV – alcohol abuse can suppress the immune response.

Finally, in January 2021, when the vaccination campaign became relevant, misinformation began to spread suggesting that there was a substantial percentage (more than 20%) of severe

Table 1. Social media reach for three fact checks by Science Anti-Fake News

Fake News Item	Date of Publication	Number of Profiles Reached	Likes and Reactions (engagements)
COVID-19 vaccines were developed too quickly to be safe and skipped pre-clinical stages.	October 2020	More than 30,000	More than 2000
You cannot drink alcohol for 42 days after Sputnik-V inoculation.	December 2020	More than 60,000	More than 5000
A huge percentage of severe side effects after COVID-19 vaccination have occurred.	January 2021	More than 50,000	More than 3000

Note: The Science Anti-Fake News team has more than 30,000 followers on Instagram, 24,000 followers on Twitter, and 6000 followers on Facebook.

Falso: las vacunas contra COVID-19 tienen nanochips.

False: The vaccines against COVID-19 have nanochips.

side effects triggered by COVID-19 vaccines. It circulated in the form of viral WhatsApp audio messages and as disturbing headlines on some media. To counteract this fake news, we analysed the results of the clinical trials of COVID-19 vaccines and the epidemiological reports of the Argentine Health Ministry, which show the events presumably attributable to vaccination. These data exposed that severe side events were no more than 1% in trials as well as in the "real world" in people who had been vaccinated in Argentina up to that point.

Once we have gathered accurate information about a topic, our team writes an essay with sources to discredit the fake news. Team members revise the message as needed so that it is in a non-technical language so our target audience can understand the information we are seeking to explain. The fact-checked statement is then shared on the ConfiAR platform and on our social media accounts. Table 1 shows the social media influence of the three fact checks mentioned above.

The case of SputnikV and alcohol deserves a deeper analysis. The misinformation about the need to abstain from alcohol for 42 days brought about many calls and requests from TV and radio shows. So, for example, when we clarified the information regarding alcohol drinking and SputnikV live on one of the most popular Argentine TV channels, the video with the accurate information had 18,427 views on YouTube.[12] We thought about some possible explanations for this phenomenon. Christmas

and New Year's Eve were approaching, there was so much confusion and concerns regarding SputnikV, partly because of the absence of public Phase III results and partly due to a massive campaign against this vaccine elicited by many journals and digital media.[13-16] We hypothesised that those were the reasons why this fact check went so viral.

Discussion

The researcher Carina Cortassa[17] establishes the Deficit and the Ethnographic Contextual models to best describe the concept of the public

communication of science. The Deficit model assumes the lay public to be scientifically illiterate. It emerges from the traditional model of teacher-student. The Ethnographic Contextual model is based on an anthropological conception that contemplates the dialogue and the interests of the audiences and tries to take into account the previous knowledge of the public to enrich the understanding of science. Science Anti-Fake News adheres to the Ethnographic model because it was born from popular experience in the context of a pandemic and of the uncertainty experienced in 2020.

Our project continues. Day after day, we decide which statements to fact check based on social media interaction with our audience and by noticing the topics that are being covered in the news media.

Throughout these 2 years of intensive experience in dismantling false information, it has become clear that fake news also poses a political problem. Science took centre stage around the world due to the coronavirus pandemic and positioned itself as the main guide for public policy in most countries. Stopping the spread of false news contributes to the success of actions aimed at mitigating the damage of a crisis – in this case, the COVID-19 pandemic. So, dismantling fake news implies cooperating with the success of health policies.

Before the pandemic, the impact of the massive spread of fake news by social media on vaccination coverage was already known. The Vaccine Confidence Project showed that Japan

Falso: existen diversas curas para el coronavirus que están ocultando.

False: There are cures for the coronavirus that are being hidden.

Falso: algunas vacunas contra COVID-19 no se probaron en animales y se hicieron ensayos directamente en humanos.

False: Some vaccines against COVID-19 were not tested on animals and were tested directly on humans.

ranked among the countries with the lowest vaccine confidence in the world in 2018.[18] The authors suggested that the low confidence there might be linked to safety scares in 2013 regarding the human papillomavirus (HPV) vaccine. This event ended in the suspension of proactive recommendation of the HPV vaccine by the Japanese Ministry of Health. As a result, HPV vaccination coverage decreased approximately 70% in 2 years. Moreover, this news about the Japanese Ministry of Health's actions spread globally by online media and social media networks and was applauded by anti-vaccine groups. Related to this, previous studies showed that vaccine-related social groups can influence the opinion of the population about vaccination, decreasing immunisation rates and in consequence, bringing on disease outbreaks.[19] In the past few years, Pakistan and Nigeria have experienced an increase in poliovirus cases as new waves of misinformation surrounding the polio vaccine have been circulating in both countries.[18]

Factors more consistently associated with improved vaccine uptake included high confidence in vaccines, trust in healthcare workers as a source for medical and health advice (rather than family, friends, or other nonmedical sources), and higher levels of science education.[18] Another study[20] reports that if we ask audiences to focus their attention on the accuracy of the information they receive, instead of the emotions it provokes, the level of spread of misinformation shared online can be reduced. This supports the importance of our work in the fight against fake news.

We would like to emphasise that the fake news discussed in this article were selected based on our social media analysis. We do not know how the fact checks may have affected TV and radio audiences that watched and/or listened to the shows. Moreover, the overall impact on engagement on our social media does not take into consideration that perhaps our Facebook, Twitter, and Instagram accounts share followers, overestimating the social media reach. On the other hand, the Science Anti-Fake News team has demonstrated that it is possible to combat fake news through interdisciplinary hard work and commitment to the sharing of high-quality, well-researched information.

Given that misinformation affects vaccination rates, we hold that it is essential for scientists to commit to the popularisation of scientific information, especially in contexts of uncertainty and crisis. Science must not be separate from society and can and must offer responses according to the urgency of the context. Our Science Anti-Fake News team was born to persist, and we will keep fighting fake news on further health topics beyond COVID-19.

Disclosures and conflicts of interest

The authors declare no conflicts of interest.

Data availability statement

For inquiries about data and other supplemental information, please contact the corresponding author.

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