



Waves, storms & going viral: Science communication on social media during a pandemic

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Outbreaks in the digital age: Twitter is the place where the (good, the bad and the ugly) action is...

#nCoV #coronavirus #WuhanPneumonia #WuhanSARS....

Marcel Salathé
@marcelsalathe

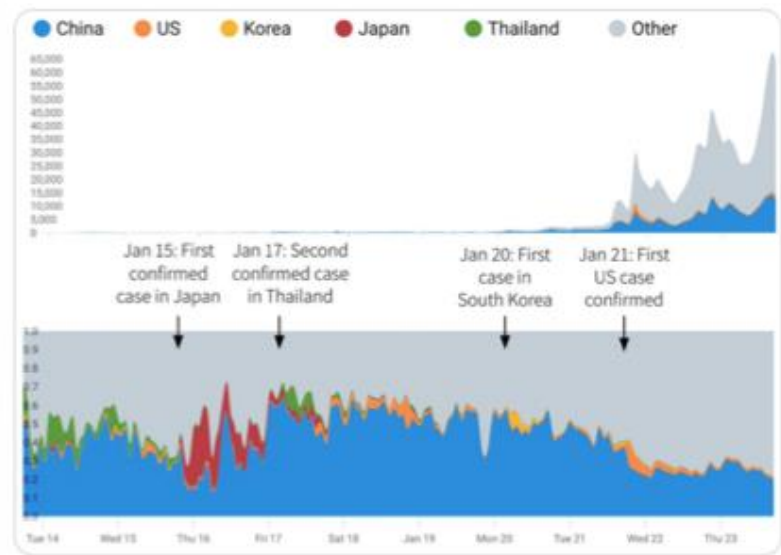
Now getting to 20+ tweets per second on #nCoV2019 #wuhan coronavirus situation:
crowdbreaks.org/en/projects/nc...



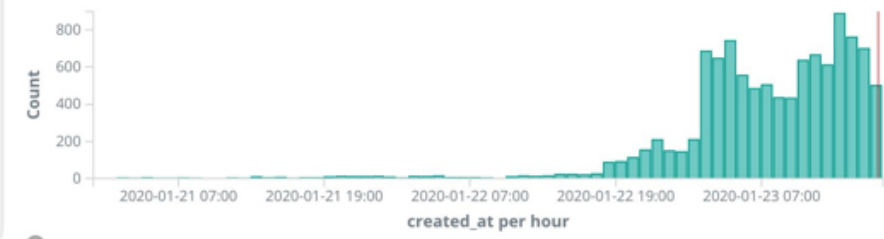
Thread

Martin Müller
@marmuel_

Pretty interesting to see how closely mention of countries follows the outbreak patterns of #nCoV2019. Happy to present more about this next week @appliedmldays in the Health & AI track hosted by @ensoesie! :)



#snakefake



Science & social media during the pandemic:

The good, the bad and the ugly


Science, policy & social media - The good aspects

- **Science has become visible** – discussions that normally take place among scientists have become visible to the public (including preliminary, inconsistent and contradictory results)
- Quick way to **collaborate & connect** with other researcher & exchange ideas
- Opportunity to find like-minded colleagues and **build networks/start initiatives**
- Scientists are heard, possibility to **provide information to the public** (welcomed by many)
- Scientists are **leaving their ivory tower** – science is perceived as something that affects society as a whole and has an impact
- Some scientists have become almost “rock stars” – which can serve as a **role models** and help to transport a **positive image of science** – (especially when showing diversity in science!)

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Scientific consensus on the COVID-19 pandemic: we need to act now

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Published: October 15, 2020 • DOI: [https://doi.org/10.1016/S0140-6736\(20\)32153-X](https://doi.org/10.1016/S0140-6736(20)32153-X)

Social media can connect like-minded scientists and facilitate initiatives (met only 2 of the authors so far in real life!)

JOHN SNOW MEMORANDUM

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MORE THAN 6,900 scientists, researchers & healthcare professionals have now signed the John Snow Memorandum.

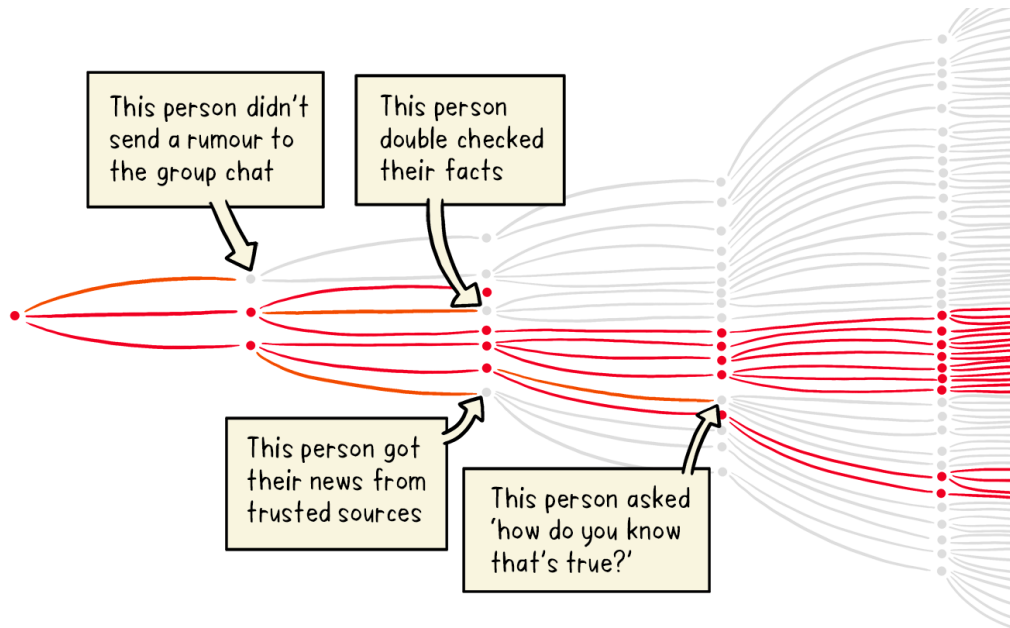
We vet every signature, so it may take 72 hours for your name to appear. Thanks for your support, and please continue to share with your colleagues.



THE JOHN SNOW MEMORANDUM

The bad – Infodemics & misinformation

An infodemic is too much information including false or misleading information in digital and physical environments during a disease outbreak



https://www.who.int/health-topics/infodemic#tab=tab_1



Home / Health topics / Infodemic



Infodemic

Infodemic - epidemic of information – term coined during severe acute respiratory syndrome (SARS) to define the amplification effect of the news through information technologies

A more recent definition: “infodemic” includes elements of misinformation spreading rapidly through social media platforms

Infodemics – a new element that needs to be understood and controlled during outbreaks

- Study of infodemics is relatively new
- Little is known about the relationship with epidemics management
- Vaccine hesitancy as one example: eroded trust in institutions fueled by misinformation
- Scientists and policy-makers can study, model, and monitor both phenomena in parallel
- Enforces the much needed interdisciplinary of research areas in the management of epidemics (e.g. social sciences and biological sciences along)

Table 1. The main analogies between epidemics and infodemics

Features	Epidemics	Infodemics
Agent	Infectious agent (i.e., virus, bacterium, fungus, parasite...)	Type of message in a given medium (e.g., particular conspiracy theory in a viral video, a statistic on vaccine efficacy in a tweet)
Medium	Route of transmission (respiratory, oral-fecal route, sexual contacts...)	Communication channel (news, social media platform, newsgroup, radio program, blog...)
Timescale	Infectious period, reproductive number	How quickly information spreads and accumulates, including the persistence of mis- and dis-information
Network of interaction	The pattern of contacts along which transmission occurs (individuals who have a contact at risk for transmission)	Communication network for the user and content interaction (nodes of transmission, interconnectedness, clustering, homophily, content filtering algorithms)
Control measures	Actions to limit the epidemic (vaccination campaigns, non-pharmaceutical interventions, epidemiological surveillance)	Actions to limit the infodemic (skill building, science and media literacy, pre-bunking)

Challenges of science communication on social media

- Science is a process, knowledge is **constantly under validation**
- Understanding of science as a **self-correcting process** (doesn't mean someone made a mistake (old tweets!))
- Misinformation can have **life-or-death consequences**
- **Responsibility of platforms** – mark misinformation, or cancel it?
- **Cherry-picking** of debates (confirmation bias)
- Risk of communications and tweets taken out of context
- **Algorithms** are not made to provide the best (reliable) health information
- **Lack of basic/technical understanding** can make exchanges very hard to almost impossible (e.g. discussion about use of PCR, virus isolation)
- Danger of **mixing opinions or personal views** with scientific data
- Scientists are (usually) **not trained to use social media** – institutions can provide only little guidance/support (protection, legal advice)

Engaging in policy & on social media has its price for scientists

- Investment of **time & energy**
- High demand for information coincides with emergence of **new research questions** (e.g. new variants)/during research-intensive times
- Risks of **losing credibility** by being cited in a misleading way
- Journalists **re-use tweets** for newspaper articles (instead of conducting interviews, **this is usually without authorization**)
- Scientific engagement on social media is a young phenomenon & sometimes **seen critical by older colleagues**
- Easier in stabilized positions than for junior colleagues
- Intensive engagement in social media can be seen as „**not working enough**“ (<-> professionalism)

The Ugly

-

Attacks on scientist engaging on social media

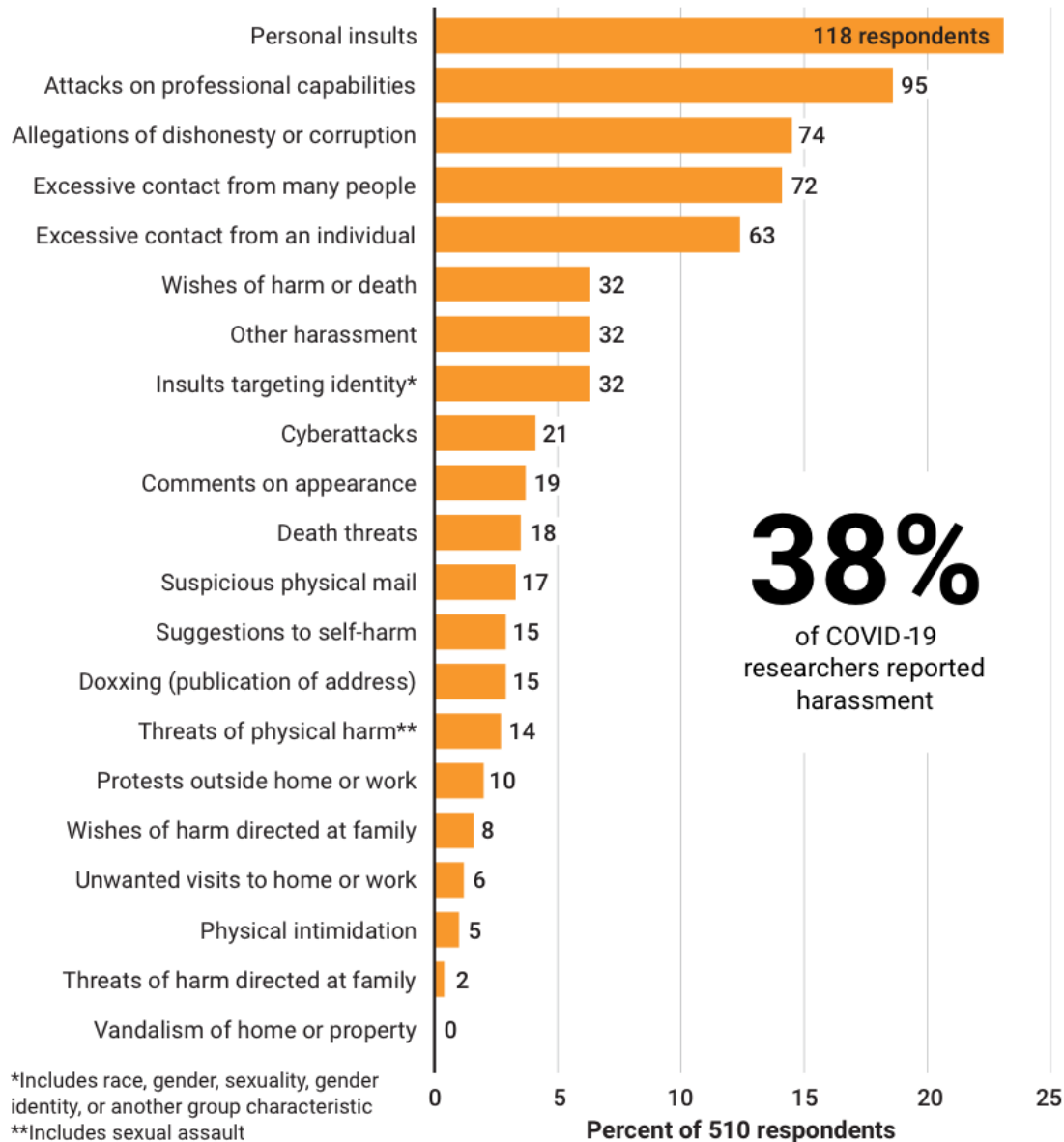
Public engagement & its side effects

- Study done by the journal Science, published March 2022
- 9585 researchers who have published on COVID-19 were contacted
- 510 responded:
 - 38% at least one attack
 - Insults to death threats on social media, by email or phone, or even in person
 - Effects on scientists lives (workplace, mental health issues)
 - Aligns with reports of violence on HCW
 - Harassment is not new or unique to COVID-19
 - Familiar to what has been observed in climate science and animal research
 - Harrasment has led to withdrawal from public communication (publicity/policy advice)



An outbreak of harassment

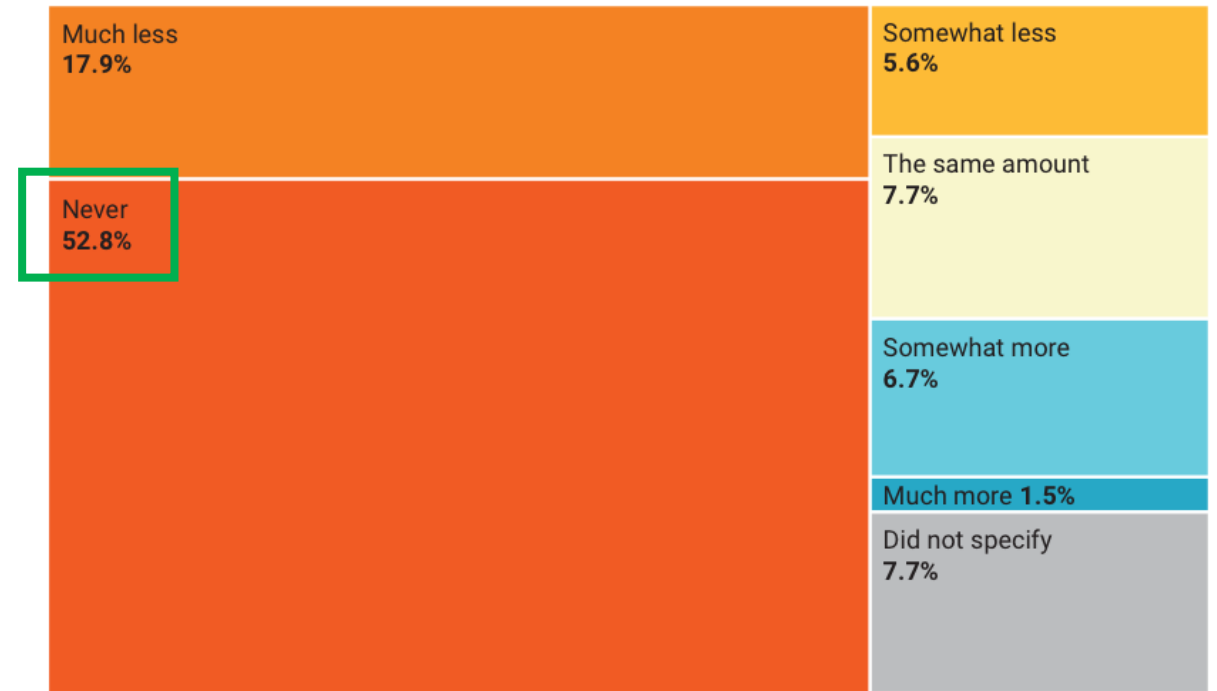
Out of 510 COVID-19 researchers surveyed by *Science*, 38% reported at least one kind of harassment. Personal insults and attacks on people's competence or integrity were most often reported. Threats of violence, "doxxing," and unwanted visits were far less common.



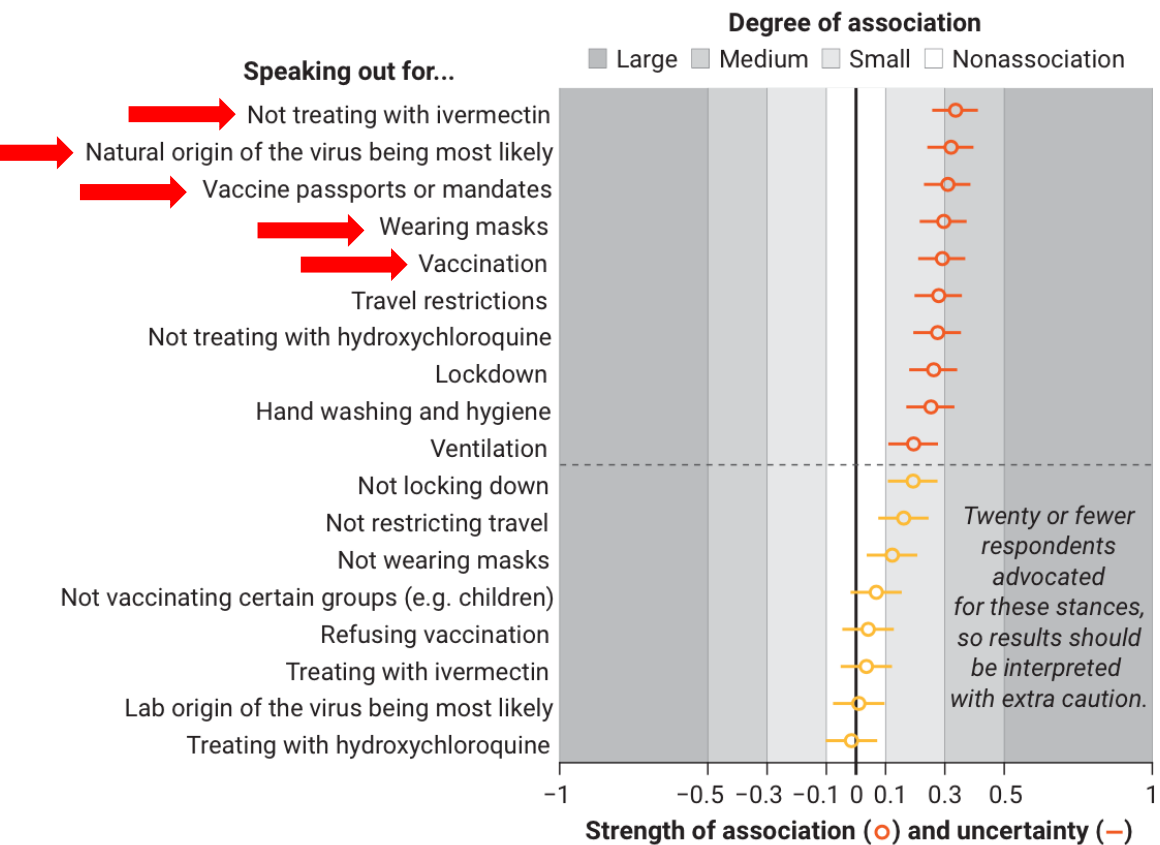
A new wave of abuse

Among COVID-19 researchers who reported being harassed, 71% said they experienced far less abuse or none at all before the pandemic began.

"Before the COVID-19 pandemic, had you ever experienced unwanted behaviors, harassment, bullying, intimidation, stalking, or threats as a result of your work?"



K. FRANKLIN/SCIENCE



Death threats after a trial on chloroquine for COVID-19

Unfavorable results from a chloroquine clinical trial led to death threats and animosity towards researchers in Brazil. Estella Ektor reports.



"The only conclusion you can take from the study is that this drug, when used in high doses, is not safe", declared Marcus Lacerda, the principal investigator of the first randomised controlled clinical trial that tested chloroquine

administered extremely high doses and used a less-safe version of the drug hydroxychloroquine, then used this as a pretense to indicate that chloroquine was ineffective and dangerous". Soon after, Brazilian president's son

of evidence, and anecdotal accounts, to support treating COVID-19 with chloroquine, a drug traditionally used to treat malaria and having potential adverse effects, in particular relative to cardiovascular function. "These



This online publication by

THE LANCET Infectious Diseases

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Cyber harassment of female scientists will not be the new norm

Caroline Samer ✉ • Karine Lacombe • Alexandra Calmy

Published: December 23, 2020 • DOI: [https://doi.org/10.1016/S1473-3099\(20\)30944-0](https://doi.org/10.1016/S1473-3099(20)30944-0)

«having been victims ourselves—female professors of medicine—to varying degrees of threats of all kinds, including violent defamatory statements, stalking, and misogynistic and gender-oriented attacks. These attacks were exclusively linked to public interventions in the media...»

<https://www.science.org/content/article/overwhelmed-hate-covid-19-scientists-face-avalanche-abuse-survey-shows>

Ektor E. Death threats after a trial on chloroquine for COVID-19. Lancet Infect Dis. 2020; 20: 661

[https://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(20\)30944-0/fulltext](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30944-0/fulltext)

'I hope you die': how the COVID pandemic unleashed attacks on scientists

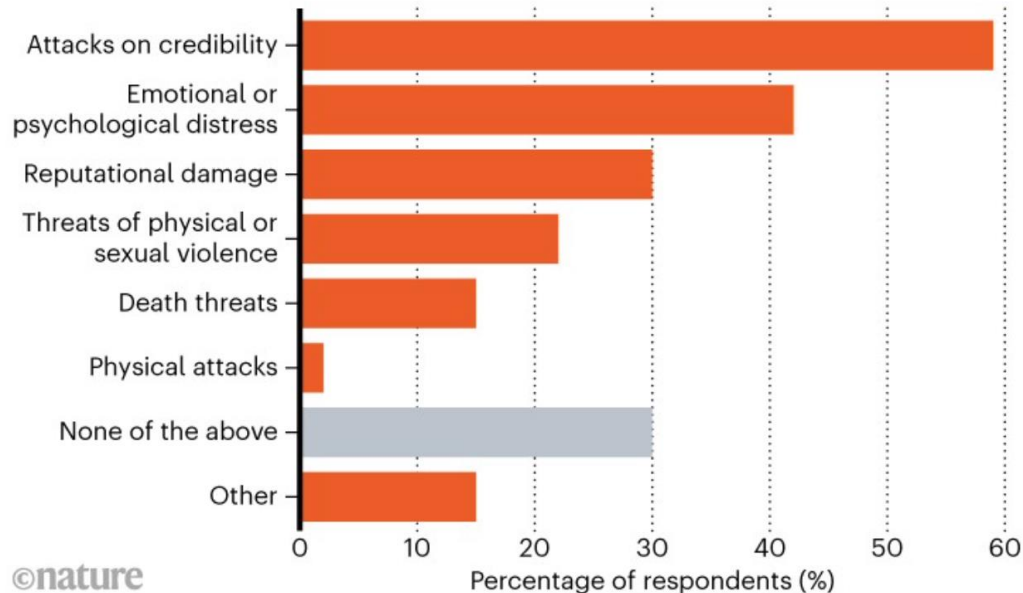
Dozens of researchers tell *Nature* they have received death threats, or threats of physical or sexual violence.

[Bianca Nogrady](#)

NEGATIVE IMPACTS

In a *Nature* survey of scientists who have commented about COVID-19, 15% of 321 respondents said they had received death threats.

Question: Have you experienced any of the following negative impacts after speaking about COVID-19 to the media, or posting on social media? (You may select multiple options.)



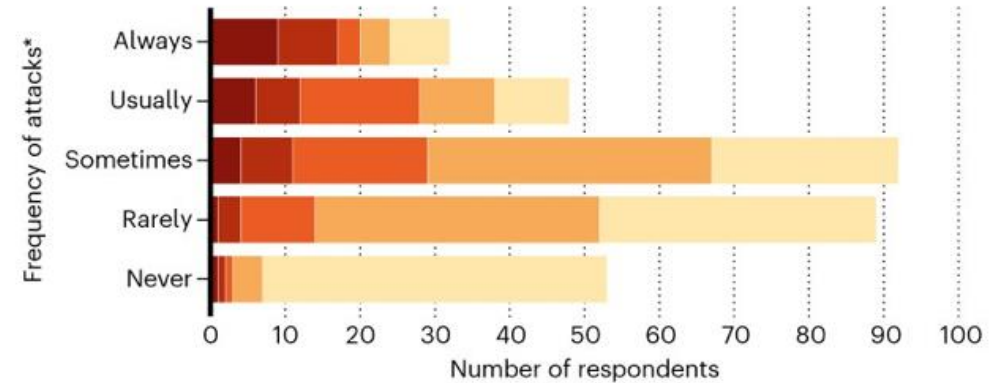
Source: *Nature* analysis

CHILLING EFFECT?

In *Nature's* survey, scientists who reported the highest frequency of trolling or personal attacks* were also most likely to say that their experiences had greatly affected their readiness to give future media interviews.

Question: How much have your experiences with trolls and personal attacks affected your willingness to speak to the media in the future?

■ An enormous amount ■ A lot ■ A moderate amount ■ A little ■ Not at all



*Respondents who answered the question: Have you experienced trolling or personal attacks after speaking about COVID-19 in the media?

©nature

Source: *Nature* analysis

Among the scientists who responded to *Nature's* survey, 63% used Twitter to comment on aspects of COVID-19, and around one-third of those said they were 'always' or 'usually' attacked on the platform

85% of survey respondents said that their experiences of engaging with the media were always or mostly positive

<https://www.nature.com/articles/d41586-021-02741-x>

Being a CoV researcher on Twitter....

About myself:

- Research on CoVs since 2011
- Networks for information during MERS-CoV-2 outbreaks and before: Promed.mail, informal networks as source of information
- On Twitter since 2014, at that time with a few 100's followers
- Today: >95K Followers
- Twitter has become an important source for real-time of information from colleagues, follow conferences, keep up to date
- But interaction more difficult due to much ,noise'
- Attacks, need to block & report comments on daily basis (↑ ↑ in 2022)

Experiences engaging in policy & (social) media:

- **Scientific advice unwanted**, especially in the beginning, & pandemic threats downplayed
- Accusations of **fear mongering**
- Concepts delivered by scientists **not welcomed**
- Scientific advice from **,convenient' experts** preferred
- Many **experts emerged** that never worked in the field of emerging viruses before 2020



Isabella Eckerle
@EckerleIsabella

Jan 1st and we have already the first outbreak due to [#emergingviruses](#) of the new year - interested to know the source, civet cats and bats sold on this market? [#SARS](#), or SARS-related CoV?

onisillos sekkides @onisillos · Jan 1

China shuts seafood market linked to mystery viral pneumonia outbreak | South China Morning Post
[scmp.com/news/china/pol...](https://www.scmp.com/news/china/pol...)

4:07 PM · Jan 1, 2020 · [Twitter Web App](#)



Isabella Eckerle @EckerleIsabella · 14 Jan 2020

A virus so close to SARS, it is not unlikely to be capable to H2H transmission. Also mild cases could go undetected so the real risk of ongoing transmission will only be assessed with a diagnostic test [#coronavirus](#)



Isabella Eckerle @EckerleIsabella · 25 Jan 2020

This is not good! Asymptomatic shedding will make surveillance very difficult. In SARS, virus was shedded after symptom onset -> key for containment [#nCoV2019](#) [#coronavirus](#) [twitter.com/MackayIM/statu...](https://twitter.com/MackayIM/status...)



Isabella Eckerle @EckerleIsabella · 26 Jan 2020

Very important note, especially since chances are we will not be able to contain this outbreak. The sooner we accept this the better to start preparing for a huge challenge to all health systems (high income countries too) [#coronavirus](#) [#nCoV2019](#) twitter.com/richardhorton1...

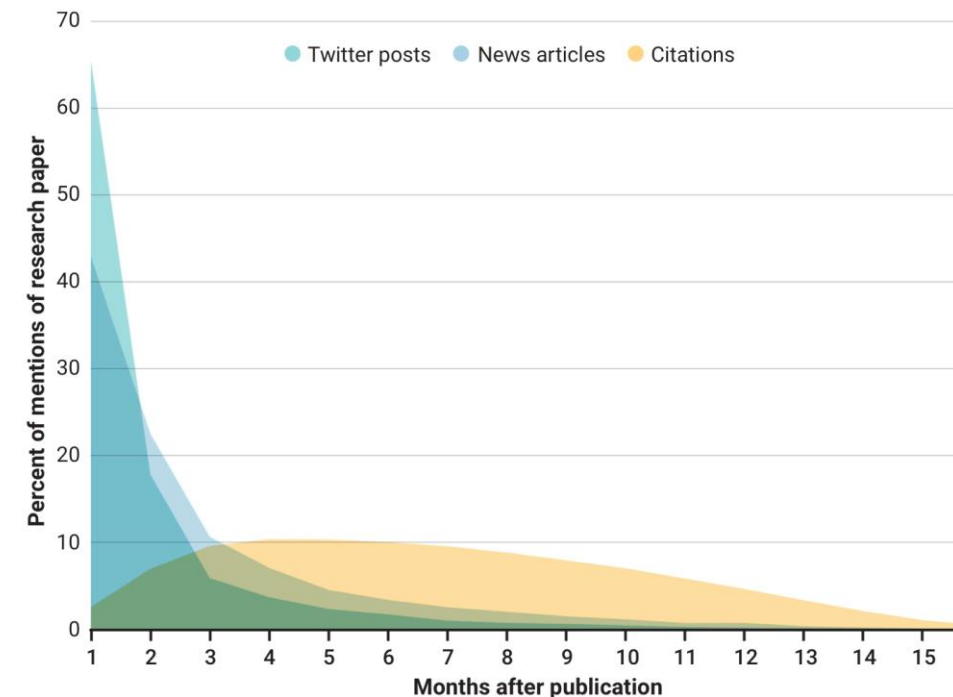


Science communication on social media in the middle of a crisis - my personal take-away

- Use it to connect with colleagues – and then interact with them on other channels for a more **professional exchange**
- Take the opportunity to **make your own science visible** – why is this an important field, what can we learn, what are implication of our findings?
- Advice on policy has more impact when it is delivery by a **panel of experts** (from different disciplines, & personal attacks reduced)
- Know who you follow & **who to trust** (many scientists communicate great, follow the real experts & benefit from their knowledge)
- **Block hard & early, do not feed the trolls, report harassment**
- Take **social media breaks** & time to rest
- Engagement of scientist can make a difference but comes at a cost
- Cave: **Balance pros & cons** (has changed a lot since 2022!)

Rapid responses

Conversations about new research papers on Twitter happen quickly—then soon tail off, like mentions in news stories. Citations in other journal articles, the more traditional channel for scholarly attention, are spread out over many more months.



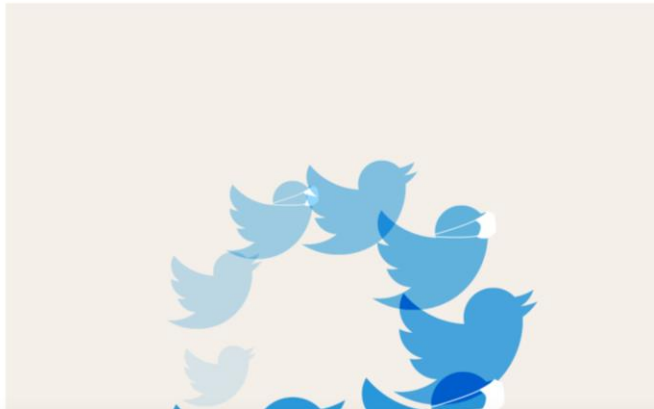
(GRAPHIC) K. FRANKLIN/SCIENCE; (DATA) L. WALTMAN ET AL., SCHOLARLY COMMUNICATION IN TIMES OF CRISIS, RESEARCH ON RESEARCH INSTITUTE, DOI: 10.6084/M9.FIGSHARE.17125394 (2021)

The future of (science) communication on Twitter: Stay or go?

OPINION
GUEST ESSAY

Twitter Was Influential in the Pandemic. Are We Better for It?

Nov. 19, 2022



Carl T. Bergstrom, NYT
Nov 19, 2022

«By early 2022, the value I found on Twitter had **fallen off**....Some of my colleagues left or locked their accounts. **Coordinated harassment** quashed nuanced debate. Covid Twitter is **barely a trace of what it was** two years ago.»

@CT_Bergstrom

SCIENCEINSIDER | SCIENTIFIC COMMUNITY

As Musk reshapes Twitter, academics ponder taking flight

Many researchers are setting up profiles on social media site Mastodon

4 NOV 2022 · 4:00 PM · BY [KAI KUPFERSCHMIDT](#)



With Elon Musk's takeover, many scientists are considering doing away with Twitter for other options. DRUG NARODA/SHUTTERSTOCK AND ANYAPL/SHUTTERSTOCK, ADAPTED BY C. SMITH/SCIENCE

“If the people who like to tell me I’m a stupid/fat/ugly/old/unfuckable/unloveable/compromised/corrupt/conflicted/incompetent bitch get a free pass to say whatever without constraint or moderation, the **cost-benefit analysis would change for me**”

Angela Rasmussen @angie_raamussen

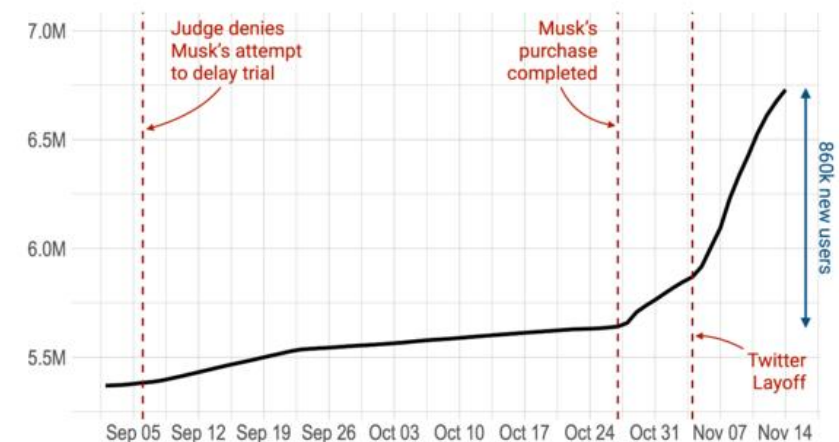
‘Verified’ anti-vax accounts proliferate as Twitter struggles to police content

Platform's paid verification system is being used to give sense of validity to accounts pushing health misinformation



Total mastodon users

Data from @mastodonusercount@bitcoinhackers.org



Source: <https://mastodon.social/@estebanmoro/109342663127191604>

If Science communication becomes endemic on social media...

- Scientists need to consider the **impact of social media**
- **Outreach activities are a chance** for better science communication
- **Training of scientists** in the use of social media (wording, language, communication skills & strategies)
- Better **protection by institutions** against personal attacks
- Scientific community but also governments and funding agencies must take **steps against silencing of science** (not only in relation to infectious diseases but also other controversial topics)
- **Limits of science communication** on social media must be understood: Complexity of research cannot always be reflected
- Twitter may no longer be the place to be (only bad & ugly)
- Alternative platforms?

Thank you for your attention!

@Eckerlelsabella

@Eckerlelsabella@mstdn.science