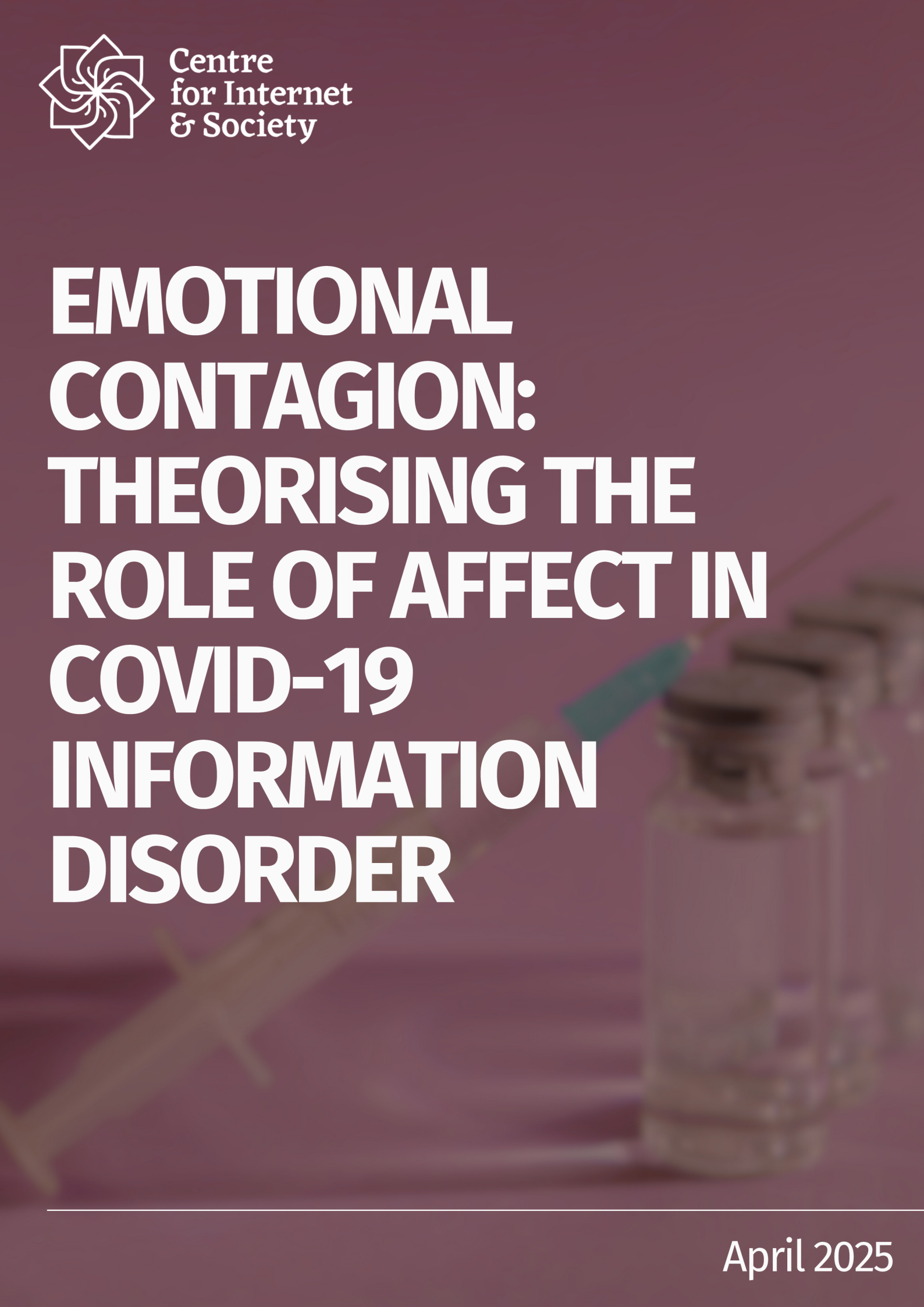

Centre for Internet & Society

EMOTIONAL CONTAGION: THEORISING THE ROLE OF AFFECT IN COVID-19 INFORMATION DISORDER

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Abstract

In recent years, the phenomenon of “fake news” has become an increasingly contentious issue for its inflammatory role in impacting elections, creating biased narratives about marginalised communities, and spreading health-related misinformation (particularly during the COVID-19 pandemic). At the same time, we have witnessed these widespread fears of fake news, mis- and disinformation being frequently weaponised to stifle media freedom and free speech. The term “information disorder” provides a helpful articulation of the plethora of issues within the online information ecosystem, the nature of this phenomenon extends beyond falsity and intention to harm.

While a majority of misinformation and disinformation studies focus on measuring impacts, platform mechanics and dissemination tactics, less attention has been paid to the psychological and sociological phenomena influencing information trust and reception—i.e. how we receive information, the emotions they evoke, and why. This study seeks to address this gap by analysing the emotional dimensions of information processing, particularly in the Indian context.

Via a qualitative, desk-based methodology, we investigate the intersection of affect and information disorder. Our research identifies theoretical frameworks from psychology, sociology, and media studies to understand information disorder and its relationship with emotions and affect, and then analyses COVID-19 vaccine hesitancy in India through these theoretical lenses. Within this context, we analysed real-world reports to understand the primary emotions driving certain responses.

Our research highlights fear as a dominant emotional driver in information disorders, with negative emotions playing a crucial role in both the creation and consumption of misinformation. These negative affective responses often override rational cognitive processes, creating vulnerability to misleading content, especially during crisis situations like the pandemic.

The interplay between these diverse theoretical perspectives reveals how emotional, cognitive, and social factors create complex information reception patterns that cannot be fully explained by any single disciplinary approach.

Finally, we conclude with recommendations for future interventions that recognise the affective dimensions of misinformation. These include the creation of more tailored media, digital literacy and education; providing multiple sources of reliable information on online platforms; and providing further opportunities for multimodal misinformation research in India. This approach seeks to move beyond the limitations of the "fake news" terminology, recognising that information disorder encompasses content that blends truth with falsehood, spans multiple formats beyond traditional news, and exists within complex socio-emotional contexts that influence reception and belief.

1. Introduction

In April 2023, X announced that anyone with an X Premium subscription could get a blue checkmark on their profile,[1] doing away with its previous criteria that a 'verified' account had to be "authentic, notable and active"[2] to be eligible for a blue checkmark. In 2024, the platform acknowledged that they deprioritised external link-sharing and diverse sources of information in favour of native platform content.[3] At the beginning of January 2025, Meta announced major changes to its content moderation approach across its platforms, shifting away from third-party fact-checking towards a community-based system similar to X's model.[4] This shift by major platforms towards diluting platform-based content moderation and officially 'verified' information points to certain shifts in the way platforms are thinking about maintaining information integrity, and is particularly concerning at a time when the quantum of harmful content encountered on these platforms is exponentially increasing with each passing year.[5,6]

In India, while social media has provided a means for connection and information sharing, it has also become increasingly contentious for its inflammatory role in influencing elections,[7] fanning regional tensions,[8] and spreading health-related misinformation, including during the COVID-19 pandemic.[9]

The term 'fake news' does not adequately capture the breadth of misleading content in our current information landscape. Not all of this content is fabricated. Often, it consists of genuine information taken out of context and strategically wielded by bad actors who understand that falsehoods grounded in a kernel of truth are more likely to be believed and circulated.

1. "How to Get the Blue Checkmark on X"", X Help Center, https://help.x.com/en/managing-your-account/about-x-verified-accounts. Last accessed 19 February 2025.

2. "Legacy Verification Policy", X Help Center, https://help.x.com/en/managing-your-account/legacy-verification-policy. Last accessed 19 February 2025.

3. Io Dodds, "Elon Musk Confirms that He's Limiting People's Ability to Share Outside News on X", The Independent, 26 November 26, 2024,. https://www.independent.co.uk/tech/elon-musk-x-news-links-b2653614.html. Last accessed 19 February 2025.

4. Joel Kaplan, "More Speech and Fewer Mistakes", Meta, 7 January 07, 2025. https://about.fb.com/news/2025/01/meta-more-speech-fewer-mistakes/. Last accessed 19 February 2025.

5. "Report Harmful Content 2023 Annual Report", SWGfL, 28 March 2024, https://swgfl.org.uk/magazine/report-harmful-content-publishes-insights-and-trends-from-2023/.

6. Fabian Koh, "Rise in harmful social media content, with increase in those inciting racial, religious tension, violence: Online safety poll", CNA, 25 July 2024, https://www.channelnewsasia.com/singapore/rise-harmful-social-media-content-increase-those-inciting-racial-religious-tension-violence-online-safety-poll-4496021. Last accessed 19 February 2025.

7. The Hindu Bureau, "Misinformation During Indian Elections: The Saga from 2019 to 2024", The Hindu, 26 March 2024, https://www.thehindu.com/news/national/misinformation-during-indian-elections-the-saga-from-2019-to-2024/article67989996.ece. Last accessed 19 February 2025.

8. Press Trust of India, "Rumours, Fake News Major Menace Fuelling Violence in Manipur: Officials", Economic Times, 23 July 2023, https://economictimes.indiatimes.com/news/india/rumours-fake-news-major-menace-fuelling-violence-in-manipur-officials/articleshow/102056288.cms?from=mdr. Last accessed 19 February 2025.

9. Press Trust of India, "Rumours, Fake News Major Menace Fuelling Violence in Manipur: Officials", Economic Times, 23 July 2023, https://economictimes.indiatimes.com/news/india/rumours-fake-news-major-menace-fuelling-violence-in-manipur-officials/articleshow/102056288.cms?from=mdr. Last accessed 19 February 2025.

A substantial portion of this content cannot even be classified as 'news' since it also includes rumours, memes, manipulated videos, hyper-targeted 'dark ads',[10] and recycled images.[11] In this report, we rely on the term 'information disorder' instead to better capture this spectrum of false or misleading content.

Current approaches to information disorder primarily rely on fact-checking to counter misinformation with 'correct' or 'verified' information. [12,13]

Fact checking tends to classify information within a neat 'true/false' binary. As studies have suggested, it is important to situate what we understand as 'truth' within the complex interrelationship between knowledge production, power, and technological systems.[14]

While it is critical to report on falsities, it also often fails to account for underlying issues that tend to rouse 'irrational' emotions and affect in individuals and in-groups.[15,16] For example, claims rooted in deep-rooted religious beliefs and identities (driven by the need to adhere to in-group social norms)[17] serve as a powerful shield against empirical scrutiny, since such claims cannot be definitively verified. An additional limitation is that fact-checking requires robust infrastructures that are often lacking in the languages of the Global South.[18]

Information disorder systematically pollutes digital ecosystems by exploiting both technological platforms and psychological vulnerabilities, fundamentally eroding societal trust and digital resilience, and corroding our shared information environment. It also has the capability to target and channel powerful affects to cause harm.

10. *A type of online advertising visible only to the publisher of the advertisement and the intended target group.*

11. Claire Wardle, "Understanding Information Disorder", First Draft, 22 September 2020, https://firstdraftnews.org/long-form-article/understanding-information-disorder/.

12. Emma Hoes, Brian Aitken, Jingwen Zhang, Tomasz Gackowski, and Magdalena Wojcieszak, "Prominent Misinformation Interventions Reduce Misperceptions but Increase Scepticism", Nature Human Behaviour, 8, (2024): 1545–-1553, https://doi.org/10.1038/s41562-024-01884-x.

13. Xia-Ji Liu, Qi Li, Laurent Wang, and Miriam J Metzger, "Checking the Fact-Checkers: The Role of Source Type, Perceived Credibility, and Individual Differences in Fact-Checking Effectiveness", Communication Research, 0, no. 0 2023): https://journals.sagepub.com/doi/10.1177/00936502231206419.

14. Stephan Lewandowsky, Ullrich K. H. Ecker, and John Cook, "Beyond Misinformation: Understanding and Coping with the "Post-Truth" Era", Journal of Applied Research in Memory and Cognition, 6, no. 4 (2017): 353–369. https://doi.org/10.1016/j.jarmac.2017.07.008.

15. Yochai Benkler, Robert Farris, and Hal Roberts, Network Propaganda: Manipulation, Disinformation, and Radicalization in American Politics (Oxford University Press, 2018).

16. W. Lance Bennett and Barbara Pfetsch, "Rethinking Political Communication in a Time of Disrupted Public Spheres", Journal of Communication, 68, no. 2, (2018): 243–254, https://doi.org/10.1093/joc/jqx017.

17. Simon Chauchard and Sumitra Badrinathan, "The Religious Roots of Belief in Misinformation: Experimental Evidence from India", https://sumitrabadrinathan.github.io/Assets/paper-covid.pdf.

18. Fact-checking Initiatives in Bangladesh, India, and Nepal: A Study of User Engagement and Challenges", 5 November 2018, https://arxiv.org/pdf/1811.01806.

In this context, it is particularly critical to foreground the affective drivers of information disorder, particularly since major online platforms are increasingly eliminating traditional guardrails against false, misleading, or hateful content.

It is to bridge this gap in current understanding that we situate this exploratory study, with the aim to offer an understanding of the drivers that help spread misinformation. In this paper, we begin by examining the key concepts at play – information disorder and affect – and how they relate to each other. We then explore a few theoretical frameworks that underpin our analysis of information disorder; from a communications, psychological and sociological lens. Finally, we apply these theoretical lenses to a specific case study: the relationship between affect and information disorder in the context of vaccine hesitancy during the COVID-19 pandemic in India. With this framing, we hope to move beyond solutions for combating misinformation, rather look at social phenomena in which this misinformation is often received. We also offer some recommendations on areas for further research.

Understanding information disorder

Drawing from a systematic review of 34 studies on 'fake news' between 2003 and 2017, Tandoc et al. typologise the term to identify six forms of fake news: satire, parody, fabrication, manipulation, propaganda, and advertising,[19] which can then be analysed through the dual lens of facticity and intention. 'Facticity' refers to the degree to which a piece of information is anchored in fact, whereas 'intention' measures the degree of the author's deliberate attempt to deceive.[20] Claire Wardle and Hossein Derakshan apply these criteria to identify three types of information disorder – misinformation, disinformation, and malinformation – that differ on the basis of falsity and intent to cause harm:[21]

1. **Disinformation:** Information that is false and has been deliberately created to harm a person, social group, organisation, or country. This includes false content, imposter content,[22] manipulated content, and fabricated content.[23] Disinformation – while not always political in nature – is often used in political contexts to spread false narratives for political gains.
2. **Misinformation:** Information that is false, but which was not created with the intention of causing harm. This includes making false claims and misleading content.
3. **Malinformation:** Information that is based on reality, but which is deliberately used to cause harm to a person, organisation, or country. This includes information leaks, harassment by sharing private information, and hate speech.

19. Edson C. Tandoc Jr., Zheng Wei Lim, and Richard Ling, "Defining "Fake News": A Typology of Scholarly Definitions", Digital Journalism, 6, no. 2, (2017): 137–153, https://doi.org/10.1080/21670811.2017.1360143.

20. Edson C. Tandoc Jr., Zheng Wei Lim, and Richard Ling, "Defining "Fake News" A Typology of Scholarly Definitions", Digital Journalism, 6, no. 2, (2017): 137–153, https://doi.org/10.1080/21670811.2017.1360143.

21. "Information Disorder: Toward an Interdisciplinary Framework for Research and Policy Making", Council of Europe, 27 September 2017, https://edoc.coe.int/en/media/7495-information-disorder-toward-an-interdisciplinary-framework-for-research-and-policy-making.html#.

22. *Imposter content is false or misleading content that impersonates genuine sources.*

23. *Manipulated content is genuine content that has been altered; fabricated content is completely false.*

In order to better understand this phenomenon, precise language is important. This study focuses on the emotional aspects of information disorder rather than its terminological distinctions. Hence, we have chosen to collectively refer to these phenomena as 'misinformation' or at times, 'information disorder' or 'disinformation'.[24] For the purpose of this paper, we are less concerned with the intention with which the message is being spread and more concerned with the affective structures that evoke certain emotional responses. We have adopted these terms for brevity in expression; we do not intend to be reductive of the many distinct ideas and theories that are important to this field of research.

24. Francesco Pierri, Alessandro Artoni, and Stefano Ceri, "Investigating Italian Disinformation Spreading on Twitter in the Context of 2019 European Elections", PLoS ONE, 15, no. 1, (2020): https://doi.org/10.1371/journal.pone.0227821.

2. Methodological approaches to studying misinformation

In an attempt to capture the complexity of information disorder, researchers have adopted a variety of approaches including qualitative, quantitative, and mixed methods.

A popular approach utilises computational and data-driven methods such as social network analysis to map the spread of misinformation through social networks,[25] and machine learning and natural language processing to detect and classify misinformation at scale by analysing text and multimedia[26] and to identify bots that spread misinformation.[27]

While some studies measure individual responses to and interactions with misinformation under controlled conditions,[28] others use surveys to capture wide-scale beliefs and the consequent behaviours arising from misinformation and disinformation.[29,30] Qualitative content analysis explores themes and narratives used to drive misinformation,[31] while quantitative content analysis systematically codes large volumes of content to identify patterns and trends.[32] Ethnographic research explores how misinformation manifests in diverse cultural contexts,[33,34] and participant observation involves direct engagement with real-world settings where misinformation is discussed or shared.[35]

25. Francesco Pierri, Alessandro Artoni, and Stefano Ceri, "Investigating Italian Disinformation Spreading on Twitter in the Context of 2019 European Elections", PLoS ONE, 15, no. 1, (2020): https://doi.org/10.1371/journal.pone.0227821.

26. Kai Shu et al., "Fake News Detection on Social Media: A Data Mining Perspective." ACM SIGKDD Explorations Newsletter, 19, no. 1, (2017): 22–36, https://doi.org/10.1145/3137597.3137600.

27. Chengcheng Shao et al., "The Spread of Low-Credibility Content by Social Bots." Nature Communications, 9, no. 4787, (2018): https://doi.org/10.1038/s41467-018-06930-7.

28. G. Pennycook, Tyrone D. Cannon, and David G. Rand, "Prior Exposure Increases Perceived Accuracy of Fake News", Journal of Experimental Psychology: General, 147, no. 12, (2018): 1865–1880, https://doi.org/10.1037/xge0000465.

29. Richard Fletcher et al., "Factsheet: Measuring the Reach of 'Fake News' and Online Disinformation in Europe", Reuters Institute for the Study of Journalism, (2018): https://reutersinstitute.politics.ox.ac.uk/sites/default/files/2018-02/Measuring%20the%20reach%20of%20fake%20news%20and%20online%20distribution%20in%20Europe%20CORRECT%20FLAG.pdf.

30. S. Mo Jones-Jang, Tara Mortensen, and Jingjing Liu, "Does Media Literacy Help Identification of Fake News? Information Literacy Helps, but Other Literacies Don't", American Behavioral Scientist, 65, no. 2, (2019): 371–388, https://doi.org/10.1177/0002764219869406.

31. Alice Marwick and Rebecca Lewis, "Media Manipulation and Disinformation Online", Data & Society, (2017): https://www.posiel.com/wp-content/uploads/2016/08/Media-Manipulation-and-Disinformation-Online-1.pdf.

32. J. Scott Brennen et al., "Factsheet: Types, Sources, and Claims of COVID-19 Misinformation Key Findings", Reuters Institute for the Study of Journalism, (2020): https://doi.org/10.1145/3137597.3137600.

33. Marilia Duque and Luiz Peres-Neto, "Can Older People Stop Sharing? An Ethnographic Study on Fake News and Active Aging in Brazil", Online Media and Global Communication, 1, no. 3, (2022): 580–599, https://doi.org/10.1515/omgc-2022-0034.

34. Sharifa Sultana and Susan R. Fussell, "Dissemination, Situated Fact-Checking, and Social Effects of Misinformation among Rural Bangladeshi Villagers during the COVID-19 Pandemic", Proceedings of the ACM on Human-Computer Interaction, 5 (CSCW2), no. 436, (2021): 1–34, https://dl.acm.org/doi/abs/10.1145/3479580.

35. Jen Schradie, The Revolution That Wasn't: How Digital Activism Favors Conservatives, (Harvard University Press, 2019). https://doi.org/10.4159/9780674240438.

Many researchers combine multiple methodologies for a more comprehensive understanding of information disorder. For instance, they combine computational analysis with qualitative interviews, or survey data with social network analysis.[36] Case studies often feature in-depth analyses of specific misinformation events or campaigns, combining multiple data sources and methods.[37]

Theoretical modelling is also an important approach, with scholars developing models to explain the mechanisms by which misinformation is spread and the factors affecting belief.[38] Given the complex nature of information disorder, many researchers adopt an interdisciplinary approach, combining insights and methods from psychology, sociology, political science, computer science, and communication studies.[39]

36. Deen Freelon and Chris Wells, "Disinformation as Political Communication", Political Communication, 37, no. 2, (2020): 145–56, https://doi.org/10.1080/10584609.2020.1723755.

37. Kate Starbird, Ahmer Arif, and Tom Wilson, "Disinformation as Collaborative Work: Surfacing the Participatory Nature of Strategic Information Operations", Proceedings of the ACM on Human-Computer Interaction, 3 (CSCW), (2020): 1–26, https://doi.org/10.1145/3359229.

38. Brian G. Southwell, Emily A. Thorson, and Laura Sheble (eds.), Misinformation and Mass Audiences, (University of Texas Press), 2018. https://doi.org/10.7560/314555.

39. "Information Disorder: Toward an Interdisciplinary Framework for Research and Policy Making", Council of Europe Report, 27 September 2017, https://edoc.coe.int/en/media/7495-information-disorder-toward-an-interdisciplinary-framework-for-research-and-policy-making.html#.

2.1 Research methods

In this study, we explore the affective dimensions of information disorder using a qualitative, desk-based research methodology. This research primarily utilises document analysis and reviews academic literature related to the affective or emotional factors that prime our responses to information. It also incorporates news reports, policy reports, and online discussions and social media posts related to COVID-19 and COVID vaccine hesitancy to uncover patterns of emotional engagement with misinformation.

Cultural attitudes towards gender play a crucial role in shaping women's political experiences. Traditional gender norms often dictate that women should occupy subordinate roles and reinforce social hierarchies that marginalise women's contributions.[32,33]

2.1.1 Steps followed

We started by exploring various theories on information processing. After detailed desk-based research, we narrowed down a few key sociological, psychological, and communication theories that we considered well-suited to studying information disorder.

To identify and select theories relevant to information disorder, we employed a structured search strategy based on key evaluation parameters. We conducted searches across various academic databases using the following search term combinations, among others:

- "affect/emotion" + "information processing"
- "affect/emotion" + "misinformation/disinformation/information disorder"
- "information processing/disorder" + ("social/psychological/communication theory")
- "social media" + "information processing/disorder"
- "covid" + "misinformation/disinformation/information disorder"

We evaluated theories based on their ability to explain both individual and collective information processing behaviours, prioritising those that addressed psychological and social aspects of information consumption and dissemination. Within this selection, we prioritised theories that could explain the present digital ecosystem across different cultural contexts, particularly in India. We assessed their relevance to present-day information disorder and their capacity to explain the multiple stages of information processing. The practical application of these theories in addressing information disorder was a key consideration in our final selection.

For the case study analysis, we primarily looked at news articles, fact-checking websites, and information reported during the first and second waves of the COVID-19 pandemic in India (2020–2021), with a few select instances from 2022.

We then analysed a selection of fake news artefacts using information processing frameworks to see what affective structures have been used and how they have been operationalised. Finally, we summarised our findings to talk about a few key themes that can explain the major affective structures identified in this study.

2.1.2 **Limitations**

Given that this case study takes a qualitative approach, we do not have real-time primary data. Further, there is no way to corroborate the analysis, as it is exploratory in nature and aimed at understanding the phenomena of affect and misinformation using COVID-19 misinformation in India.

To a large extent, we have borrowed analytical frameworks and models from Western thought. While there have been important works from Indian thinkers across various disciplines, we could not find theories that are directly applicable to misinformation. We hope that future studies in this area can address this gap.

3. **Background**

In times of political strife or social upheaval, popular discourse tends to re-examine the impact of emotions on the perception of 'truth'. In 2005, comedian Stephen Colbert popularised the informal term 'truthiness' to describe "... not the truth, we're talking about something that seems like truth – the truth we want to exist".[40] In the aftermath of the United States elections and the United Kingdom's Brexit referendum in 2016, 'post-truth' beat other popular terms like 'alt-right', 'brexiteer', and 'woke'[41] as the Oxford Word of the Year due to the sudden spike in its usage.[42]

While 'affect' and 'emotion' are somewhat distinct terms, they are often used interchangeably.[43] In modern psychological usage:

"'Affect' refers to the mental counterpart of internal bodily representations associated with emotions, actions that involve some degree of motivation, intensity, and force, or even personality dispositions. In the science of emotion, 'affect' is a general term that has come to mean anything emotional."[44]

'Emotion' is a non-conscious state of feeling that accompanies affect. 'Affect' is a broader term that encompasses emotion as well as cognitive appraisal, subjective experience, and behavioural expression.[45] Affect plays a powerful role in shaping our perceptions and decisions.[46] In this paper, we look at how affect influences the dissemination, acceptance, and impact of misinformation, disinformation, and malinformation. While there are subtle distinctions between 'affect' and 'emotion', for the purposes of this paper, we use the terms interchangeably. Our intention is to focus on how affect and emotion can drive susceptibility to information disorder.

40. The Paley Center for Media, "Colbert Report Writers - Truthiness and Pun Journals", 24 October 2011, YouTube video, 04:35, https://www.youtube.com/watch?v=WvnHf3MQtAk.

41. "Word of the Year 2016 - Shortlist", Oxford Languages, 2016. https://languages.oup.com/word-of-the-year/2016-shortlist/. Last accessed 19 February 2025.

42. "Post-truth (adj.)", Oxford English Dictionary, https://doi.org/10.1093/OED/3755961867. Last accessed 19 February 2025.

43. Murray Alpert and Anna Rosen, "A Semantic Analysis of the Various Ways that the Terms "Affect," "Emotion," and "Mood" are Used", Journal of Communication Disorders, 23, no. 4–5, (1990): 237–246, https://doi.org/10.1016/0021-9924(90)90002-G.

44. Lisa Feldman Barrett and Eliza Bliss-Moreau, "Affect as a Psychological Primitive", Advances in Experimental Social Psychology, no. 4, (2009): 167–218, https://doi.org/10.1016/S0065-2601(08)00404-8/.

45. James A. Russell, "Emotion, Core Affect, and Psychological Construction", Cognition and Emotion, 23, no. 7, (2009): 1259–1283, https://doi.org/10.1080/02699930902809375.

46. Lisa Feldman Barrett and Eliza Bliss-Moreau, "Affect as a Psychological Primitive", Advances in Experimental Social Psychology, no. 4, (2009): 167–218, https://doi.org/10.1016/S0065-2601(08)00404-8/.

Affect plays a significant role in information processing, influencing how we perceive, interpret, and respond to information. Emotionally charged content is more likely to capture attention, bias our interpretation of information, and motivate us to seek or avoid certain information, influencing our exposure to diverse perspectives.

In the context of misinformation, affect can therefore amplify its spread and impact. Emotionally charged misinformation can more readily capture attention, distort interpretation, and trigger emotional contagion,[47] leading to its rapid dissemination and acceptance.

47. *Emotional contagion is a phenomenon in which a person unconsciously mirrors or mimics the emotions of those around them.*

3.2.1 Psychological theories

The British Psychological Society (BPS) defines psychology as the scientific study of the mind which helps understand how the mind influences human behaviour. It explores the study of human behaviour and the thoughts, feelings and motivations behind it – 'through observation, measurement, and testing, in order to form conclusions that are based on sound scientific methodology.' In this section, we look at a few relevant psychological theories that help explain responses to misinformation.[58]

TABLE 1: PSYCHOLOGICAL THEORIES BEHIND MISINFORMATION RESPONSE

THEORY	EXPLANATION	HOW IT INTERACTS WITH MISINFORMATION
1. DUAL-PROCESS MODEL	Kahneman[59] proposes two distinct cognitive systems: system 1 operates rapidly and intuitively, relying on heuristics and emotional cues, while system 2 engages in slower, more deliberate processing.	Emotionally charged misinformation – often designed to evoke fear, anger, or anxiety – amplifies the influence of system 1, overriding rational evaluation and leading individuals to accept and share misinformation that aligns with their existing affective states. This phenomenon is particularly pronounced in the context of social media, where the rapid dissemination of emotionally charged content can create echo chambers and reinforce existing biases.
2. AFFECT-AS-INFORMATION	Clore et al.[60] argue that emotions are not merely passive responses but informative cues that guide an individual's judgements and decisions.	Emotionally charged misinformation can leverage this by triggering specific emotions like fear or anger – which can be internally misconstrued as indicators of truth or importance – leading to acceptance and dissemination of misinformation.
3. MOTIVATED REASONING	Kunda[61] proposes that individuals are motivated to maintain their existing beliefs and worldviews, even when confronted with contradictory information.	Emotionally charged misinformation can tap into these motivations by aligning with existing beliefs. This triggers confirmation bias and affective priming, leading individuals to reject contradicting evidence and accept misinformation that reinforces their worldview.
4. COGNITIVE-EMOTIONAL VULNERABILITY MODEL	Pennycook and Rand[62] propose that individuals with high levels of both cognitive vulnerability (e.g., low working memory) and emotional vulnerability (e.g., anxiety) are particularly susceptible to misinformation.	This model highlights the positive relationship between high cognitive and emotional vulnerability, and high susceptibility to misinformation.

58. "What is psychology?", The British Psychological Association, https://www.bps.org.uk/what-psychology. Last accessed 31 March 2025.

59. Daniel Kahneman, "A Perspective on Judgment and Choice: Mapping Bounded Rationality", American Psychologist, 58, no. 9, (2003): 697–720, https://doi.org/10.1037/0003-066X.58.9.697.

60. Gerald L. Clore and Justin Storbeck, "Affect as Information about Liking, Efficacy, and Importance", in Affect in Social Thinking and Behavior, (Psychology Press, 2006). https://doi.org/10.4324/9780203720752.

61. Ziva Kunda, "The Case for Motivated Reasoning", Psychological Bulletin, 108, no. 3, (1980): 480–498, https://doi.org/10.1037/0033-2909.108.3.480.

62. Gordon Pennycook and David G. Rand, "Lazy, Not Biased: Susceptibility to Partisan Fake News is Better Explained by Lack of Reasoning than by Motivated Reasoning", Cognition, 188, (2019): 39–50, https://doi.org/10.1016/j.cognition.2018.06.011.

3.2.2 Sociological theories

Sociology helps understand and investigate the structure of groups and societies and how people interact within various social settings. This understanding of social behaviour in turn has been shaped by certain sociological theories, which have played a role in enriching one's comprehension of societal dynamics. Engaging with these theories offers deeper insights into the historical, current, and future contexts of social phenomena.[63] In this section, we look at some sociological theories which can help explain responses to misinformation.

TABLE 2: SOCIOLOGICAL THEORIES BEHIND MISINFORMATION RESPONSE

THEORY	EXPLANATION	HOW IT INTERACTS WITH MISINFORMATION
SYMBOLIC INTERACTIONISM	Symbolic interactionism addresses how society is created and maintained through repeated interactions between individuals. Symbolic interactionists are often less concerned with objective structure than with subjective meaning—how repeated, meaningful interactions among individuals come to define the makeup of 'society.' Therefore, the focus is less on meaning in its abstraction and more on the idea that meanings emerge from interactions with other individuals and with society.[64]	Symbolic interactionism can help explain how fact checking often may not work as an effective response to misinformation. Fact checking acts more on debunking or terming something as fake as opposed to countering the idea that is being shared through a piece of online content. Thus, this notion of shared meaning may sometimes be neglected in the exercise of fact checking thus rendering it less effective in certain instances.
EMOTIONAL CONTAGION THEORY	Hatfield et al.[65] propose that emotions can spread rapidly between individuals, influencing information processing and decision-making. Key aspects of emotional contagion include the role of non-verbal cues and empathy, the importance of social context, and rapid transmission.	This theory can explain the rapid dissemination of emotionally charged misinformation on social media, where emotions like anger or fear can quickly amplify the spread and impact of misinformation.[66] Social media platforms – with their vast networks and rapid dissemination capabilities – serve as fertile ground for emotional contagion, facilitating the spread of misinformation through emotional resonance and social validation.

63. Nicole Jose, "Major Sociological Theories", SocJournal, 16 July 16 2024, https://sociology.org/sociological-theories/.

64. Michael Carter and Celene Fuller, "Symbolic Interactionism", Sociopedia.isa (2015), 10.1177/205684601561.

65. Elaine Hatfield, John T. Cacioppo, and Richard L. Rapson, "Emotional Contagion", Current Directions in Psychological Science, 2, no. 3, (1993): 96–100, https://doi.org/10.1111/1467-8721.ep10770953.

66. Hunt Allcott and Matthew Gentzkow, "Social Media and Fake News in the 2016 Election", Journal of Economic Perspectives, 31, no. 2, (2017): 211–36, https://doi.org/10.1257/jep.31.2.211.

3.2.3 Communication theories

Given its framing and agenda setting power, the media can significantly influence how individuals perceive and interpret information. By emphasising certain aspects of an issue while downplaying others, media outlets can shape public understanding and influence attitudes and behaviours.[67] This is particularly evident in the context of misinformation, where framing can manipulate perceptions of veracity, making it difficult for individuals to discern fact from fiction.[68]

In the digital age, algorithms have become the gatekeepers of information, shaping individuals' online experiences and influencing their exposure to diverse perspectives. These algorithms – often designed to maximise user engagement[69] – can inadvertently create echo chambers and filter bubbles by prioritising content that aligns with users' existing preferences and filtering out opposing viewpoints.[70] This can narrow perspectives and increase susceptibility to misinformation that reinforces existing biases.[71]

Echo chambers and filter bubbles can further amplify the spread of misinformation by creating a self-reinforcing feedback loop.[72]

The communication mechanisms that enable these echo chambers corrode knowledge-sharing and the collaborative nature of information landscapes, turning them into battlegrounds of contested meaning, where perception determines what we consider to be the 'truth'.

It is in this context that we fall back on communication theories to understand the interplay of affect and misinformation.

67. Robert M. Entman, "Framing: Toward Clarification of a Fractured Paradigm", Journal of Communication, 43, no. 4, (1993): 51–58, https://doi.org/10.1111/j.1460-2466.1993.tb01304.x.

68. Soroush Vosoughi, Deb Roy, and Sinan Aral, "The Spread of True and False News Online", Science, 359, no. 6380, (2018): 1146–1151, https://doi.org/10.1126/science.aap9559.

69. Sruthi Dhulipala, "The Echo Chamber Effect: How Algorithms Shape Our Worldview", Campaign Asia, 27 September 2023, https://www.campaignasia.com/article/the-echo-chamber-effect-how-algorithms-shape-our-worldview/491762.

70. Kayla Duskin et al., "Echo Chambers in the Age of Algorithms: An Audit of Twitter's Friend Recommender System", Proceedings of the 16th ACM Web Science Conference (WEBSCI '24), (2024): 11–21, https://doi.org/10.1145/3614419.3643996.

71. Judith Möller, "What are Filter Bubbles and Digital Echo Chambers?", Heinrich Böll Stiftung, March 04, 2022. https://il.boell.org/en/2022/03/04/what-are-filter-bubbles-and-digital-echo-chambers. Last accessed 19 February 2025.

72. Yochai Benkler, Robert Farris, and Hal Roberts, Network Propaganda: Manipulation, Disinformation, and Radicalization in American Politics, (Oxford University Press, 2018), pp. 75–99.

TABLE 3: COMMUNICATION THEORIES BEHIND MISINFORMATION RESPONSE

THEORY	EXPLANATION	HOW IT INTERACTS WITH MISINFORMATION
AGENDA-SETTING THEORY	McCombs and Shaw[73] suggest that by prioritising and framing certain information, the media can shape public perception and influence what issues gain importance.	The dominance of certain media narratives in India – particularly those aligned with specific political agendas – can influence public perception of events and issues. This can make it difficult for alternative narratives and potentially conflicting information – even if more accurate – to gain traction and challenge the dominant discourse.[74]
ECHO-CHAMBER THEORY	Pariser[75] suggests that by filtering information based on user preferences, social media algorithms can create isolated communities where individuals are primarily exposed to information that reinforces their existing beliefs. This can hinder critical evaluation of misinformation and contribute to its quick acceptance within echo chambers.	The prevalence of echo chambers in online spaces including WhatsApp groups and social media communities can create isolated information environments where individuals are primarily exposed to information reinforcing their existing beliefs. This can make it more challenging for individuals to encounter and critically evaluate dissenting viewpoints, including those that may debunk this misinformation.[76]

73. Maxwell E. McCombs and Donald L. Shaw, "The Agenda-Setting Function of Mass Media", Public Opinion Quarterly, 36, no. 2, (1972): 176–187, http://www.jstor.org/stable/2747787.

74. Pamela Philipose, "Backstory: The Mob-Making Media Machine", The Wire, 23 April 2022, https://thewire.in/media/backstory-the-mob-making-media-machine. Last accessed 19 February 2025.

75. Eli Pariser, The Filter Bubble – What the Internet is Hiding From You (Penguin Group, 2011).

76. Shaheen Kanthawala and Jessica Maddox, "Hiding in the Echo Chamber: Fact-Checking Failures and Individual Tactics of Accuracy Determination on WhatsApp in India", Asian Journal of Communication, 32, no. 2, (2022): 174–191, https://doi.org/10.1080/01292986.2021.2023594.

4. Case study: Information disorder and COVID-19 vaccine hesitancy

India rolled out its COVID-19 vaccination programme (the world's largest) in January 2021. Despite its leading role in global vaccine production and the development of its own indigenous vaccines,[77] India's battle against COVID-19 was significantly impeded by inequitable access on a global scale (an instance of 'vaccine nationalism' that advantaged high-income over low-income countries),[78] supply chain challenges,[79] and vaccine waste.[80] Much attention has been focused on vaccine shortages,[81] the price war between the central and state governments,[82] and patent and production restrictions.[83] However, another significant – and somewhat overlooked – challenge arose in the form of vaccine hesitancy.[84] In this section, we look at misinformation around vaccines in India and try to understand it through certain underlying emotions, beliefs, and value systems.

77. Vivek P. Chavda et al., "The Vaccine World of COVID-19: India's Contribution", Vaccines, 10, no. 11, (2022): 1943, https://doi.org/10.3390/vaccines10111943.

78. Yang Ye et al., "Equitable Access to COVID-19 Vaccines Makes a Life-Saving Difference to All Countries", Nature Human Behaviour, 6, (2022): 207–216, https://doi.org/10.1038/s41562-022-01289-8.

79. Soumya Choudhury, "Covid-19 Vaccine: How Ready is India's Supply Chain?", Fortune India, 1 March 2021, https://www.fortuneindia.com/covid-19-vaccine-in-india/covid-19-vaccine-how-ready-is-indias-supply-chain/105242. Last accessed 19 February 2025.

80. Akash Podishetty, "How Did India Waste over 100 Million Covid Vaccines?", Business Standard, 10 October 2022, https://www.business-standard.com/podcast/current-affairs/how-did-india-waste-over-100-million-covid-vaccines-122101000478_1.html. Last accessed 19 February 2025.

81. Vanita Srivastava and Subhra Priyadarshini, "Vaccine shortage dents India's coronavirus adult immunisation drive", The Lancet, 30 April 2021, https://www.nature.com/articles/nindia.2021.63. Last accessed 20 February 2025.

82. "Supreme Court to Government: Why Different Prices of Covid-19 Vaccine for States and Centre?", Times of India, 30 April 2021, https://timesofindia.indiatimes.com/india/why-different-prices-of-covid-19-vaccine-for-states-and-centre-supreme-court-asks-government/articleshow/82323760.cms. Last accessed 20 February 2025.

83. Ann Danaiya Usher, "South Africa and India push for COVID-19 patents ban", The Lancet, 396, no. 10265, (2020): pp. 1790-1791, https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)32581-2/fulltext.

84. Krishna Mohan Surapaneni et al., "The Impact of COVID-19 Vaccine Communication, Acceptance, and Practices (CO-VIN-CAP) on Vaccine Hesitancy in an Indian Setting: Protocol for a Cross-Sectional Study", JMIR Research Protocols, 10, no. 6, (2021): https://doi.org/10.2196/29733.

4.1 Understanding vaccine hesitancy

In India, vaccine hesitancy is rooted in a variety of factors, including religious and cultural beliefs, historical injustices, and widespread misinformation.

While nation-wide vaccination programmes have been critical to India's public health, scepticism and resistance have at times impeded their widespread acceptance.

In recent years, anti-vaccine sentiments – both globally and in India – have been amplified by wide-scale internet access, social media,[85] and free private messaging apps.[86]

Online platforms provide a space to propagate medical conspiracy theories and supposedly 'true' stories of malpractice and harm, enhanced by source anonymity and limited to no content moderation.[87] This is fuelled by irresponsible media reporting that cites unverified claims or inadvertently amplifies instances of side effects.[88] These instances led to concerns around vaccine safety and efficacy, contributing to a growing community of vaccine sceptics.

The COVID-19 pandemic further intensified discussions around vaccination in India. While public health campaigns and educational initiatives aimed to counteract misinformation, the anti-vaxxer movement globally continued to pose challenges to vaccination efforts, with potential consequences for public health outcomes.

The top three reasons reported by WHO and UNICEF for[89] vaccine hesitancy across all WHO regions were: (1) skewed perception of risks and benefits; (2) lack of knowledge and awareness of vaccination and its importance; and (3) religion, culture, gender, and socio-economic issues. Vaccine hesitancy may be more prevalent where its uptake is already hampered by systemic failures, limited availability, and revoked vaccine services during conflicts and natural disasters.[90]

85. Victor Suarez-Lledo and Javier Alvarez-Galvez, "Prevalence of Health Misinformation on Social Media: Systematic Review", Journal of Medical Internet Research, 23, no. 1, (2021): https://doi.org/10.2196/17187.

86. Newley Purnell, "WhatsApp Users Spread Antivaccine Rumors in India", The Wall Street Journal, 13 April 2019, https://www.wsj.com/articles/whatsapp-users-spread-antivaccine-rumors-in-india-11555153203. Last accessed 19 February 2025.

87. "Meeting the Challenge of Vaccine Hesitancy", Sabin-Aspen Vaccine Science & Policy Group, May 2020,https://www.sabin.org/app/uploads/2022/04/Sabin-Aspen-report-2020_Meeting-the-Challenge-of-Vaccine-Hesitancy.pdf.

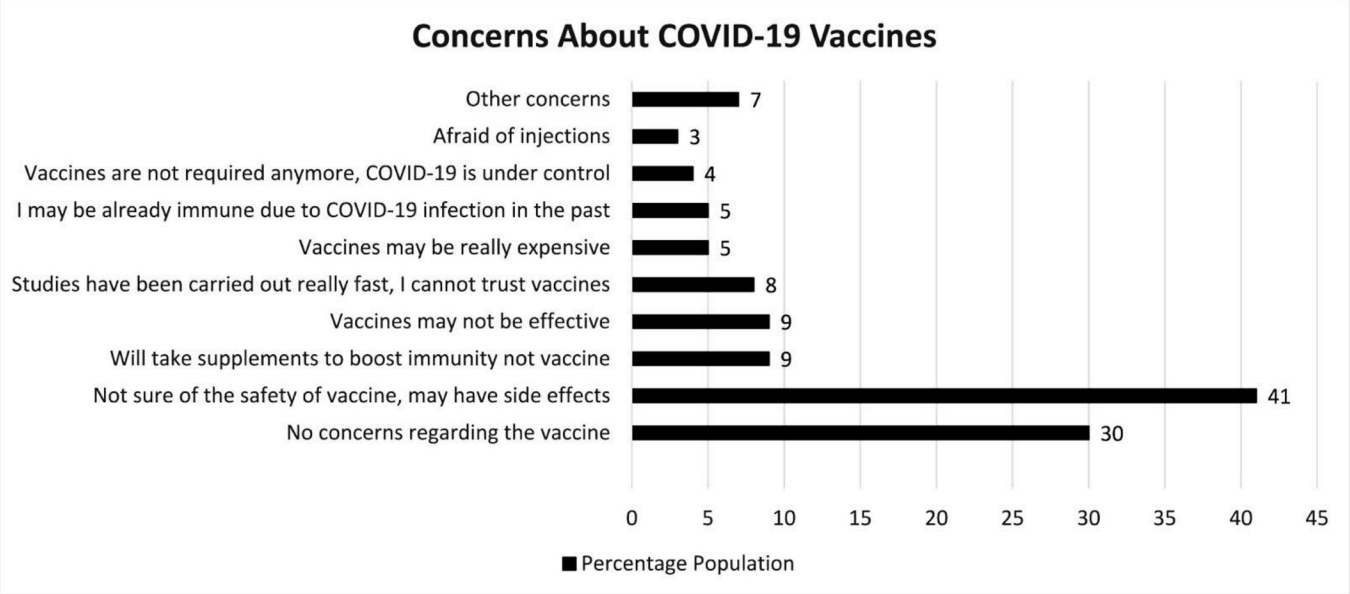
88. D. C. Sharma et al., "Fighting Infodemic: Need for Robust Health Journalism in India", Diabetes & Metabolic Syndrome: Clinical Research & Reviews, 14, no. 5, (2020): 1445–1447, https://doi.org/10.1016/j.dsx.2020.07.039.

89. Sarah Lane et al., "Vaccine Hesitancy Around the Globe: Analysis of Three Years of WHO/UNICEF Joint Reporting Form data-2015–2017", Vaccine, 36, no. 26, (2018): 3861–3867, https://doi.org/10.1016/j.vaccine.2018.03.063.

90. Noni E. MacDonald, the SAGE Working Group on Vaccine Hesitancy, "Vaccine hesitancy: Definition, scope and determinants", Vaccine, 33(34), 4161-4164, August 14, 2015. https://doi.org/10.1016/j.vaccine.2015.04.036.

Over the years many reasons for vaccine hesitancy have been identified, but two factors remain consistent: (1) lack of confidence in the public health system, and (2) lack of awareness or misinformation about the vaccine. President of the Public Health Foundation of India, Prof. Srinath Reddy explains, "People may not want to get vaccinated because they think the disease is not serious and does not warrant vaccination or they feel the vaccine is not safe. The anti-vaccine sentiment may also vary according to education levels."[91]

Figure 1: Reported reasons behind COVID-19 vaccine hesitancy



Source: Chandani, et. al (2021)[92]

During the COVID-19 pandemic, misinformation and rumours emerged as powerful influencers, shaping public perceptions of COVID-19 vaccines in India. False narratives – disseminated through social media platforms, private messaging applications, and word of mouth – led to widespread confusion around the safety and efficacy of the vaccines. Unsubstantiated or exaggerated claims about severe side effects, which included long-term health implications, created a climate of anxiety and hesitancy among potential vaccine recipients. We look at some of the factors that led to vaccine hesitancy in India in the next section.

91. Chandrima Banerjee, "Why Would You Not Want to Take a Covid Vaccine?", The Times of India, September 16, 2020. https://timesofindia.indiatimes.com/india/why-would-you-not-want-to-take-a-covid-vaccine/articleshow/78140327.cms. Last accessed 19 February 2025.

92. Sneha Chandani et al., "COVID-19 Vaccination Hesitancy in India: State of the Nation and Priorities for Research", 18, (2021): https://www.sciencedirect.com/science/article/pii/S2666354621001782.

4.2 Factors driving the amplification of vaccine hesitancy

4.2.1 Limitations

The proliferation of misinformation was driven by a collective erosion of trust in the government, health authorities, and pharmaceutical companies.

In some communities where healthcare systems were already weak, the top-down implementation of polio vaccinations in the early 2000s triggered memories of forced sterilisations during India's Emergency rule of 1975–77. Some Muslim communities in Uttar Pradesh feared that the polio vaccination programme was yet another form of targeted population control. Similar fears spread in Tamil Nadu and Karnataka in 2016–17 over the measles–rubella vaccine. In the tribal belt of Talasari in Maharashtra, many villagers stated that they would rather travel to the neighbouring state of Gujarat to seek private medical care than go to a nearby government-run centre, because they were afraid of being killed or given different vaccines than those given to health workers.[94]

Historical incidents – coupled with public perceptions of corruption – intensified skepticism about the vaccination process, particularly among marginalised communities. Emotional responses fuelled by this distrust became significant barriers to fostering vaccine acceptance.[93]

Prabir Chatterjee, a doctor working in rural Bengal as part of India's national polio surveillance project, confirmed these fears around the new COVID-19 vaccine. "Fears of sterilisation were real as for years, people had family planning shoved down their throats... That's why those rumours of impotency because people had started to believe the health department was only for family planning."[95]

Experts have said that the long path to polio vaccination success involved local religious and community leaders to build trust,[96] which plays a key role in shaping public opinion towards vaccines.

93. Daniel A. Salmon and Matthew Z. Dudley, "It is Time to Get Serious about Vaccine Confidence", The Lancet, 396, no. 10255, (2020): 870–871. https://doi.org/10.1016/s0140-6736(20)31603-2.

94. Puja Changoiwala, "In Rural India, Extreme Covid Vaccine Hesitancy", Undark, 26 April 2022, https://undark.org/2022/04/26/in-rural-india-extreme-covid-vaccine-hesitancy/. Last accessed 19 February 2025.

95. Arunabh Saikia, "To Reduce India's Vaccine Hesitancy around Covid-19, Modi Needs to 'Let Doctors Do the Talking'", Quartz, 14 December 2020, https://qz.com/india/1945640/distrust-in-modi-could-add-to-covid-19-vaccine-hesitancy-in-india. Last accessed 19 February 2025.

96. AFP, "Misinformation Blamed for Slow Start to India Vaccine Drive", Mint, 20 January 2021, https://www.livemint.com/science/health/misinformation-blamed-for-slow-start-to-india-vaccine-drive-11611135033527.html. Last accessed 19 February 2025.

Cultural and religious factors also contributed to this distrust, driving emotional responses to vaccine acceptance. Sections of Hindu and Muslim clerics raised concerns over the rumoured contents of the vaccine. While Muslim clerics were divided over the alleged presence of pork gelatin in the vaccine, some Hindu leaders demanded clarification over the reported use of cow blood. Sections of the Christian community debated the acceptability of vaccines due to the alleged use of foetal tissue from abortions.[97]

4.2.2 **Concerns about side effects**

Concerns about potential side effects – often fuelled by misinformation – were a prevalent cause of hesitancy among the Indian population. Reports of adverse events and deaths – even if rare – amplified vaccine hesitancy. Pharmaceutical companies bolstered fears further by refusing to acknowledge them and issuing legal threats to whistleblowers instead.[98]

Fear of unknown long-term side effects were fuelled by rumours and unsubstantiated news linking vaccines to infertility, death, or serious illnesses, as well as an absence of concrete proof to the contrary.

Lack of awareness about the rigorous testing and safety protocols in vaccine development amplified these anxieties. Misinformation suggesting the vaccines' ineffectiveness against new variants – often disseminated by anti-vaccine groups and amplified through social media echo chambers – also contributed to distrust.[99]

Lack of awareness about the rigorous testing and safety protocols in vaccine development amplified these anxieties. Misinformation suggesting the vaccines' ineffectiveness against new variants – often disseminated by anti-vaccine groups and amplified through social media echo chambers – also contributed to distrust.[99]

An investigation by *India Today*[100] found that vaccination drives continued to face resistance despite COVID-19 taking the lives of over 80 people in Shergarh, Rajasthan. In one conversation, Chalaram, a local shoemaker, claimed, "Those who took the jab have died. Some 30–35 families, including mine, have not taken the vaccine."

97. Arshi Aggarwal, "Faith or Safety? Covid Vaccines Spark Religious Concerns over Pork Gelatin, Cow Blood", India Today, 29 December 2020, https://www.indiatoday.in/coronavirus-outbreak/vaccine-updates/story/religious-hurdle-for-covid-19-vaccines-religious-leaders-raise-concern-over-pork-gelatin-cow-blood-in-vaccines-1753992-2020-12-28. Last accessed 19 February 2025.

98. Arunabh Saikia, "Serum Institute's Trial Has Run into a Controversy. Will This Erode Public Trust in a Vaccine?", Scroll, 5 December 2020, https://scroll.in/article/980167/serum-institutes-trial-has-run-into-a-controversy-will-this-erode-public-trust-in-a-vaccine. Last accessed 19 February 2025.

99. Sneha Chandani et al., "COVID-19 Vaccination Hesitancy in India: State of the Nation and Priorities for Research", Brain, Behavior, & Immunity - Health, no. 18, (2021): https://doi.org/10.1016/j.bbih.2021.100375.

100. Mausami Singh et al., "'Those Who Take the Jab Die': Rumours Mar Covid Vaccination Drive in Rural India", India Today, 2 June 2021, https://www.indiatoday.in/coronavirus-outbreak/story/those-who-take-the-jab-die-rumours-mar-covid-vaccination-drive-rural-india-rajasthan-bihar-uttar-pradesh-madhya-1809812-2021-06-02. Last accessed 19 February 2025.

Rumours of someone dying after taking the vaccine spread like wildfire, gripping villages one after another, catalysed by poverty and illiteracy. “I do not have the disease, so why should I take the vaccine? All those who have taken the vaccine have fallen sick,” said Chalaram’s wife, Munni.[101]

The rapid development of COVID-19 vaccines within 10 months – in contrast to the usual 10–15 years needed to develop vaccines – led to further scepticism about whether it was sufficiently tested for side effects. Some health professionals also questioned whether a vaccine developed within such a short duration could be deemed safe.[102]

A survey of 3,295 healthcare providers in 23 countries revealed that 15% of participants reported some degree of vaccine hesitancy, with 4% reporting outright refusal to take the COVID-19 vaccine.[103]

101. Mausami Singh et al., “‘Those Who Take the Jab Die’: Rumours Mar Covid Vaccination Drive in Rural India”, India Today, 2 June 2021, https://www.indiatoday.in/coronavirus-outbreak/story/those-who-take-the-jab-die-rumours-mar-covid-vaccination-drive-rural-india-rajasthan-bihar-uttar-pradesh-madhya-1809812-2021-06-02. Last accessed 19 February 2025.

102. Arunabh Saikia, “To Reduce India’s Vaccine Hesitancy around Covid-19, Modi Needs to ‘Let Doctors Do the Talking’”, Quartz, 14 December 2020, https://qz.com/india/1945640/distrust-in-modi-could-add-to-covid-19-vaccine-hesitancy-in-india. Last accessed 19 February 2025.

103. Jeanna Parsons Leigh et al., “Factors Affecting COVID-19 Vaccine Hesitancy Among Healthcare Providers in 23 Countries”, Vaccine, 40, no. 31, (2022): 4081–4089, https://doi.org/10.1016/j.vaccine.2022.04.097.

4.3 Who do we trust, and why?

The credibility of health information is shaped by psychological and social factors that influence individual perceptions. Personal connections and social dynamics wield significant influence, since information from friends, family, or acquaintances carries emotional weight and relatability.[104] Anecdotes shared within personal networks can foster trust, even in the absence of empirical evidence.[105]

For instance, a trusted family member's claims that their neighbour's child fell ill after being vaccinated would carry weight due to its personal nature; it could cause one to ignore that fever and bodyache is an expected short-term side effect of any vaccine. Additionally, confirmation bias plays a pivotal role. Individuals often gravitate towards information that aligns with pre-existing beliefs or worldviews.[106,107]

We have previously discussed people's distrust in official authorities, such as medical professionals and government agencies, which further complicates this landscape. Institutional distrust – stemming from historical instances of mal-intentioned or controversial decisions – prompts individuals to seek alternative sources that appear to be more transparent or aligned with their suspicions. Conspiracy theories often flourish in this atmosphere of scepticism.

104. Xiao Ma et al., "When Do People Trust Their Social Groups?", CHI Conference on Human Factors in Computing Systems Proceedings (CHI 2019), 4–9 May 2019, https://doi.org/10.1145/3290605.3300297.

105. Traci H. Freling, "When Poignant Stories Outweigh Cold Hard Facts: A Meta-Analysis of the Anecdotal Bias", Organizational Behavior and Human Decision Processes, 160, (2020): 51–67, https://doi.org/10.1016/j.obhdp.2020.01.006.

106. Corine S. Meppelink et al., ""I was Right about Vaccination": Confirmation Bias and Health Literacy in Online Health Information Seeking", Journal of Health Communication, 24, no. 2, (2019): 129–140, https://doi.org/10.1080/10810730.2019.1583701.

107. Carmen Peñafiel-Saiz, Lázaro Echegaray-Eizaguirre, and Amaia Perez-de-Arriluzea-Madariaga, "The Impact of Biases on Health Disinformation Research", Societies, 14, no. 5, (2024): 64, https://doi.org/10.3390/soc14050064.

Misinformation is often more believable because of the relatively lower cognitive load that it requires to process, in contrast to more complex information from scientific, academic or official sources. Simplified narratives, emotionally resonant content, or information that aligns with pre-existing mental frameworks are more readily processed by individuals.

Misleading headlines that make provocative claims are more widely shared. For instance, newspapers in the UK published articles with headlines such as "Thousands died because of Covid vaccine mistake, study shows". However, the original study in question, which was published in The Lancet, actually concluded that more than 7,000 UK hospital admissions and deaths could have been avoided if the uptake of COVID-19 vaccines had been higher.[108] In contrast, complex and nuanced information from authoritative sources may be perceived as less accessible.

108. Reuters Fact Check, "Fact Check: Misleading Headline Refers to Deaths Linked to Lack of COVID Vaccination", Reuters, 10 February 2024, https://www.reuters.com/fact-check/misleading-headline-refers-deaths-linked-lack-covid-vaccination-2024-02-09/. Last accessed 19 January 2025.

4.4. MAPPING COVID-19 MISINFORMATION TO THEORETICAL FRAMEWORKS

EXAMPLE	KEY EMOTIONS	ILLUSTRATIVE THEORETICAL FRAMEWORK	ANALYSIS
In rural Maharashtra, a vegetable vendor named Minu Dhori refused to get vaccinated because she heard an anecdote about someone who became paralysed after receiving the vaccine. This emotionally charged story bypassed her critical thinking and fuelled her anxiety about potential side effects, leading her to firmly state: "I'll die if I have to, but I won't take the vaccine." **Source:** Puja Changoiwala, "In Rural India, Extreme Covid Vaccine Hesitancy", *Undark*, 26 April 2022.	**PRIMARY EMOTIONS** Fear (afraid, scared, nervous) **SECONDARY EMOTIONS** Distress Minu's fear response overrode her rational assessment, causing intense anxiety about potential harm from the vaccine and making her averse to receiving it.	**DUAL PROCESS MODEL** **System 1:** Fast, intuitive, and emotion-driven, system 1 is readily susceptible to misinformation and fear-mongering. Vivid stories, negative anecdotes, and emotionally charged claims about the vaccine's side effects can easily bypass critical evaluation and trigger system 1 responses like anxiety and avoidance. **System 2:** Slow, deliberate, and analytical, system 2 can counter system 1 biases and engage critical thinking. However, engaging system 2 requires effort and motivation, which can be limited by cognitive overload or misinformation-induced confusion.	In the Indian context, false or misleading information often operates through system 1 pathways. Exaggerated claims about vaccine risks or emotionally charged appeals can bypass critical thinking and fuel vaccine hesitancy, particularly among individuals with low health literacy or pre-existing anxieties.
In the tribal communities of Palghar district, fear stemming from the deaths of local political leaders during the pandemic led to widespread distrust in vaccines. Villagers speculated that these deaths were linked to vaccination; this fuelled negative emotions and reinforced their hesitancy. Subhash Kharpade, a village council member, noted, "We don't know what happened exactly, but people here are illiterate," indicating that emotional responses and a lack of education heavily influenced their judgments about the vaccination. **Source:** Puja Changoiwala, "In Rural India, Extreme Covid Vaccine Hesitancy", *Undark*, 26 April 2022.	**PRIMARY EMOTIONS** Fear (afraid, frightened) **SECONDARY EMOTIONS** Distress (distressed), Hostility (distrust) The deaths of local leaders triggered collective fear and distrust, amplified by uncertainty and a lack of information.	**AFFECT-AS-INFORMATION** This theory posits that emotions serve as cues that inform our judgments and decisions. Positive emotions like trust and confidence in healthcare authorities can facilitate vaccine acceptance, while negative emotions like fear and distrust can lead to hesitancy.	Misinformation and disinformation campaigns unintentionally or deliberately exploit negative emotions like fear and anger towards authorities, manipulating them to undermine trust in vaccine initiatives. This can create an 'affect heuristic', where individuals rely on these emotions to make decisions rather than engaging in careful analysis of information.

EXAMPLE	KEY EMOTIONS	ILLUSTRATIVE THEORETICAL FRAMEWORK	ANALYSIS
Lawyer and activist Prashant Bhushan was one of the most vocal public critics of the COVID vaccine, casting doubts on the safety of the vaccine and the vested interests of pharma companies. His temporary suspension from Twitter for a few hours confirmed his suspicions. He tweeted, "This shows [that] what I have said about the congruence of interests of big pharma and IT platforms to allow just one narrative [is true]." **Source:** The Wire Staff, "'Misleading': Twitter Flags Prashant Bhushan's Anti-Vaccine Tweets", *The Wire*, 29 June 2021.	**PRIMARY EMOTIONS** Hostility (angry, scornful) **SECONDARY EMOTIONS** Self-assurance (confident, bold) His emotional response combined antagonism toward institutions with a strong conviction in his position, reinforced by his Twitter suspension.	**MOTIVATED REASONING** This theory suggests that individuals tend to interpret information in ways that align with their pre-existing beliefs and attitudes. This can create confirmation bias, where individuals seek out information that supports their existing stance on vaccination and disregard or devalue information that contradicts it.	Anti-vaccine groups often exploit motivated reasoning by providing echo chambers for hesitant individuals, reinforcing their beliefs through cherry-picked data and biased narratives. This creates a closed loop where misinformation is continuously validated and perpetuated.
In some communities where healthcare systems were already weak, the top-down implementation of polio vaccinations in the early 2000s triggered memories of forced sterilisations during the emergency rule between 1975–77. It led some Muslim communities in Uttar Pradesh to fear that the programme was a form of population control. Similar fears spread in Tamil Nadu and Karnataka in 2016–17 over the measles-rubella vaccine. **Source:** Puja Changoiwala, "In Rural India, Extreme Covid Vaccine Hesitancy", *Undark*, 26 April 2022.	**PRIMARY EMOTIONS** Fear (afraid, frightened) **SECONDARY EMOTIONS** Hostility (angry, hostile) Historical trauma created deep-seated fear and hostility toward vaccination programmes, showing that emotional memories can influence present behaviour.	**EMOTIONAL CONTAGION** This theory suggests that emotions can spread rapidly between individuals, influencing information processing and decision-making. Key aspects of emotional contagion include the role of non-verbal cues and empathy, the importance of social context, and rapid transmission.	In India, limited access to accurate information, particularly in rural areas, combined with pre-existing anxieties about healthcare systems and historical abuse, exacerbated emotional contagion. This made individuals more susceptible to misinformation campaigns and less likely to engage in critical evaluation of information. The rapid spread of misinformation about COVID-19 on social media platforms in India, often accompanied by fear-inducing visuals and messages, contributed to anxiety and panic among many people. This emotional contagion amplified the impact of misinformation and hindered effective pandemic control measures.

EXAMPLE	KEY EMOTIONS	ILLUSTRATIVE THEORETICAL FRAMEWORK	ANALYSIS
"If you take steam, there is no way you will get COVID," said Swami Indradevji Maharaj. "If the whole family takes this steam, there is no way coronavirus will come near you. Without a mask, without any sanitiser. It will sanitise your entire body from the inside. You get very strong, you get a lot of oxygen. Everything is cleaned out and your lungs are repaired. So, coronavirus can't touch you if you use steam." His false claims about steam were amplified by his followers, with his YouTube video garnering more than 340,000 views on his verified channel and seeing rapid dissemination across social media. Source: Jasper Jackson, Rahul M, Sarah Haque, "So much hot air: Twitter and Facebook let quack Covid cures spread unchecked in India", *The Bureau of Investigative Journalism*, 10 June 2021.	**PRIMARY EMOTIONS** Fear (afraid, scared, nervous) **SECONDARY EMOTIONS** Attentiveness (alert, attentive) to potential solutions, serenity (calm, at ease) falsely provided by the simple 'solution' of steam inhalation	**ECHO CHAMBER THEORY** By filtering information based on user preferences, social media algorithms can create isolated communities, where individuals are primarily exposed to information that reinforces their existing beliefs. This can hinder critical evaluation of misinformation and contribute to its acceptance within echo chambers.	Social media algorithms often create 'filter bubbles' around users, primarily exposing them to information that aligns with their existing beliefs and preferences. This can limit their exposure to diverse perspectives and factual information, particularly in contexts where vaccine misinformation is prevalent. Within these echo chambers, misinformation can solidify, reinforcing existing doubts and anxieties about vaccines. People also tend to seek out information that confirms their existing beliefs, making them more susceptible to misinformation that resonates with their biases. In online spaces, echo chambers exacerbate this confirmation bias, making it more challenging for individuals to encounter and critically evaluate information that contradicts their pre-existing views on vaccines.

5. Platforms, emotions, and misinformation

During the pandemic, platforms such as WhatsApp and Facebook became fertile ground for false and misleading information. Unverified claims, fabricated stories, and manipulated data spread quickly, often targeting specific communities and exploiting pre-existing anxieties. Misinformation in vernacular languages is even harder to identify despite the algorithms put in place to flag such content. During the COVID-19 pandemic, organised anti-vaccine groups actively weaponised social and traditional media to spread misinformation. Using emotive language and cherry-picked data, they sowed doubt about vaccines and undermined official communication.[109]

The pervasive use of WhatsApp – and similar private messaging apps such as Telegram, Signal, and Sharechat – has contributed to the swift dissemination of misleading information regarding COVID-19 in India.[110] Chain messages often circulated false remedies and misleading statistics, promoting unverified treatments as miraculous cures. The encrypted nature of these messages – while ensuring privacy – hampered efforts to trace and curb the rapid spread of such misinformation. Additionally, forwarded videos – which could contain manipulated footage and out-of-context clips – added a visual dimension, potentially amplifying their impact on recipients.

109. Jamie Mullick, "The Growing Urban Bias of India's Vaccination Drive", Hindustan Times, 16 June 2021, https://www.hindustantimes.com/india-news/the-growing-urban-bias-of-india-s-vaccination-drive-101623782827156.html. Last accessed 19 January 2025.

110. Rama Adithya Varanasi, Joyojeet Pal, and Aditya Vashistha, "Accost, Accede, or Amplify: Attitudes towards COVID-19 Misinformation on WhatsApp in India", Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems, 256, (2022): 1–17, https://doi.org/10.1145/3491102.3517588.

Figure 2: Press Indian Bureau fact checking a false Whatsapp forward claiming to be the government's roadmap for easing COVID restrictions.

Source: PIB Fact Check on X (2020)[111]

X's microblogging format was utilised for the strategic propagation of false narratives through the incorporation of misleading hashtags.[112] During the early stages of the pandemic, hashtags helped spread misinformation about the virus's origin and downplayed its severity. The platform's real-time and public nature – while fostering information sharing – also presented challenges in identifying and mitigating the spread of false information.[113] The presence of impersonated accounts on Twitter further complicated the landscape, as these accounts often posed as authoritative figures to lend credibility to misinformation.[114]

111. PIB Fact Check, Twitter, 12 May 2020, https://twitter.com/PIBFactCheck/status/1260106349062418432.

112. H. Rosenberg, Shahbaz Syed, and Salim Rezaie, "The Twitter Pandemic: The Critical Role of Twitter in the Dissemination of Medical Information and Misinformation during the COVID-19 Pandemic", Canadian Journal of Emergency Medicine, 22, no. 4, (2020): 418–421, https://doi.org/10.1017/cem.2020.361.

113. H. Rosenberg, Shahbaz Syed, and Salim Rezaie, "The Twitter Pandemic: The Critical Role of Twitter in the Dissemination of Medical Information and Misinformation during the COVID-19 Pandemic", Canadian Journal of Emergency Medicine, 22, no. 4, (2020): 418–421, https://doi.org/10.1017/cem.2020.361.

114. Gautam Kishore Shahi, Anne Dirkson, and Tim A. Majchrzak, "An Exploratory Study of COVID-19 Misinformation on Twitter", Online Social Networks and Media, 22, no. 100104, (2021): https://doi.org/10.1016/j.osnem.2020.100104.

Figure 3: Ministry of Health fact checking a tweet making false claims about mandatory COVID-19 testing for international inbound travellers.

Source: Ministry of Health on X[115]

Platforms such as Facebook, Instagram, YouTube, and X focus on content virality. This is also why popular articles, videos, and images which often contained misleading information about symptoms, prevention methods, and vaccines were further amplified by algorithms. Manipulated infographics and memes were another avenue for the spread of false statistics and unfounded claims. The visual nature of this content resonated quickly with users scrolling through their feeds.

115. Ministry of Health, Twitter, 24 December 2022, https://twitter.com/MoHFW_INDIA/status/1606479439449436161.

116. Gautam Kishore Shahi, Anne Dirkson, and Tim A. Majchrzak, "An Exploratory Study of COVID-19 Misinformation on Twitter", Online Social Networks and Media, 22, no. 100104, (2021): https://doi.org/10.1016/j.osnem.2020.100104.

6. Recommendations and concluding remarks

Understanding the spread of misinformation and people's differing notions of truth is not straightforward enough to be translated into policy recommendations. While external guardrails through platforms and regulations can be established, arriving at a meaningful solution ultimately boils down to slow moving systemic change. Keeping these in mind, and knowing what we learnt from our review and analyses of various social, psychological and communication theories, we make a few recommendations for the future.

Invest in customized media, digital literacy and education

Megan Boler identifies the targeting of emotions via personalised social media messages as the "new frontier of propaganda". She proposes looking beyond cognitive and rational approaches—underlying most critical media literacy pedagogies—to focus on the role that emotion and affect play in shaping our relationship to the news. Media education must therefore take into account the role of emotion and affect.[117] In doing so, we recommend that media and digital literacy programs be more customized on the basis of their audience. While it has been suggested that social media users with low digital literacy are more likely to fall for online misinformation, in this study we have tried to highlight how various other factors beyond digital literacy (or lack thereof) also lead to the perception of what is true and what gets shared.

In a large survey experiment involving true and false news posts about politics and COVID-19, it was found that while digital literacy played a role in the ability to discern truth from falsehood, it did not turn out to be a robust predictor of users' intentions to share true versus false headlines. Furthermore, this study highlighted that lack of digital literacy may be useful for identifying people with inaccurate beliefs, but not for identifying those who are more likely to spread misinformation online.[118]

Given the above, we recommend that awareness building programs do not take a one size fits all approach, but look instead at what may be certain considerations or factors for sharing inaccurate information—whether religious or cultural beliefs, gendered notions, or the emotional responses that a certain piece of information may invoke among different communities.

116. Gautam Kishore Shahi, Anne Dirkson, and Tim A. Majchrzak, "An Exploratory Study of COVID-19 Misinformation on Twitter", Online Social Networks and Media, 22, no. 100104, (2021): https://doi.org/10.1016/j.osnem.2020.100104.

117. Megan Boler, "Digital Disinformation and the Targeting of Affect: New Frontiers for Critical Media Education,", Research in the Teaching of English, 54, no. 2, (2019): 187-191, https://www.jstor.org/stable/26912445.

118. Nathaniel Sirlin et al., "Digital literacy and susceptibility to misinformation", Harvard Kennedy School (HKS) Misinformation Review, 2(6), (2021).

Create multiple sources of reliable information in the online ecosystem

As shared earlier, Meta recently announced several changes in its policies in the US, a major one of which was the removal of its third-party fact checking program in the US and the introduction of Community Notes.[119] It is too early to predict whether the same policy changes will be enacted in other jurisdictions (including India), but it is critical to evaluate what we know and do not know about fact checking and community notes as strategies to counter misinformation online.

Community Notes, previously called 'Bird Watch', piloted in 2021 on X as a feature empowering users to identify and highlight potentially misleading information on the platform by adding labelled boxes below potentially misleading posts. A report on X's Community Notes feature found that 209 out of 283 misleading posts in the study's sample have accurate Community Notes that were not being shown to all X users.[120] Another study suggests that Community Notes as a program can increase the trustworthiness of social media content as opposed to expert flags or appointed fact checkers.[121] However, given that Community Notes was launched no earlier than 2021, there is simply not enough we can say about its long term effectiveness or its impact on the overall information ecosystem online.

Content moderation gaps in India due to its linguistic and cultural specificities may create additional challenges if such policies were to be rolled out in India. If platforms continue to move towards lesser moderation (whether for political or economic reasons), it would merit better media literacy, awareness of fact checking strategies amongst social media platform users, and the skills to distinguish between what is true and what is not, irrespective of individual beliefs. Given our understanding of the role of emotions in how information is perceived, Community Notes may have some advantages. However, instead of replacing one with the other, a combination of approaches allowing community notes and fact-checking to complement each other on platforms may be more effective. However, the long-term impact of this is yet to be determined.

119. Joel Kaplan, "More Speech and Fewer Mistakes", Meta, 7 January 2025, https://about.fb.com/news/2025/01/meta-more-speech-fewer-mistakes/.

120. "Rated Not Helpful", Centre for Countering Digital Hate, October 2024, https://counterhate.com/wp-content/uploads/2024/10/CCDH.CommunityNotes.FINAL-30.10.pdf.

121. Chiara Patricia Drolsbach, Kirill Solovev and Nicolas Pröllochs, "Community notes increase trust in fact-checking on social media", PNAS Nexus, 3(7), 217, (July 2024), https://doi.org/10.1093/pnasnexus/pgae217.

Develop more avenues for multimodal research on misinformation in India

A majority of empirical research that currently exists around misinformation is from Global North contexts.[122] To truly understand how misinformation spreads in India, it is imperative that qualitative, quantitative, multi-platform research is carried out in more Global South contexts. This would also require creating avenues for researcher access to platform data, and more research in multilingual contexts that decentre English-only users and promote regional language platform users.

We hope that this paper provides more food for thought on our responses to information disorder—not with quick solutions and one-size-fits-all approaches, but through more meaningful interventions that examine how perceptions form within communities and effectively and carefully incorporate these insights while developing solutions.

122. Sumitra Badrinathan and Simon Chauchard, "Researching and countering misinformation in the Global South", Current Opinion in Psychology, 55, no. 101733, (February 2024), https://doi.org/10.1016/j.copsyc.2023.101733.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