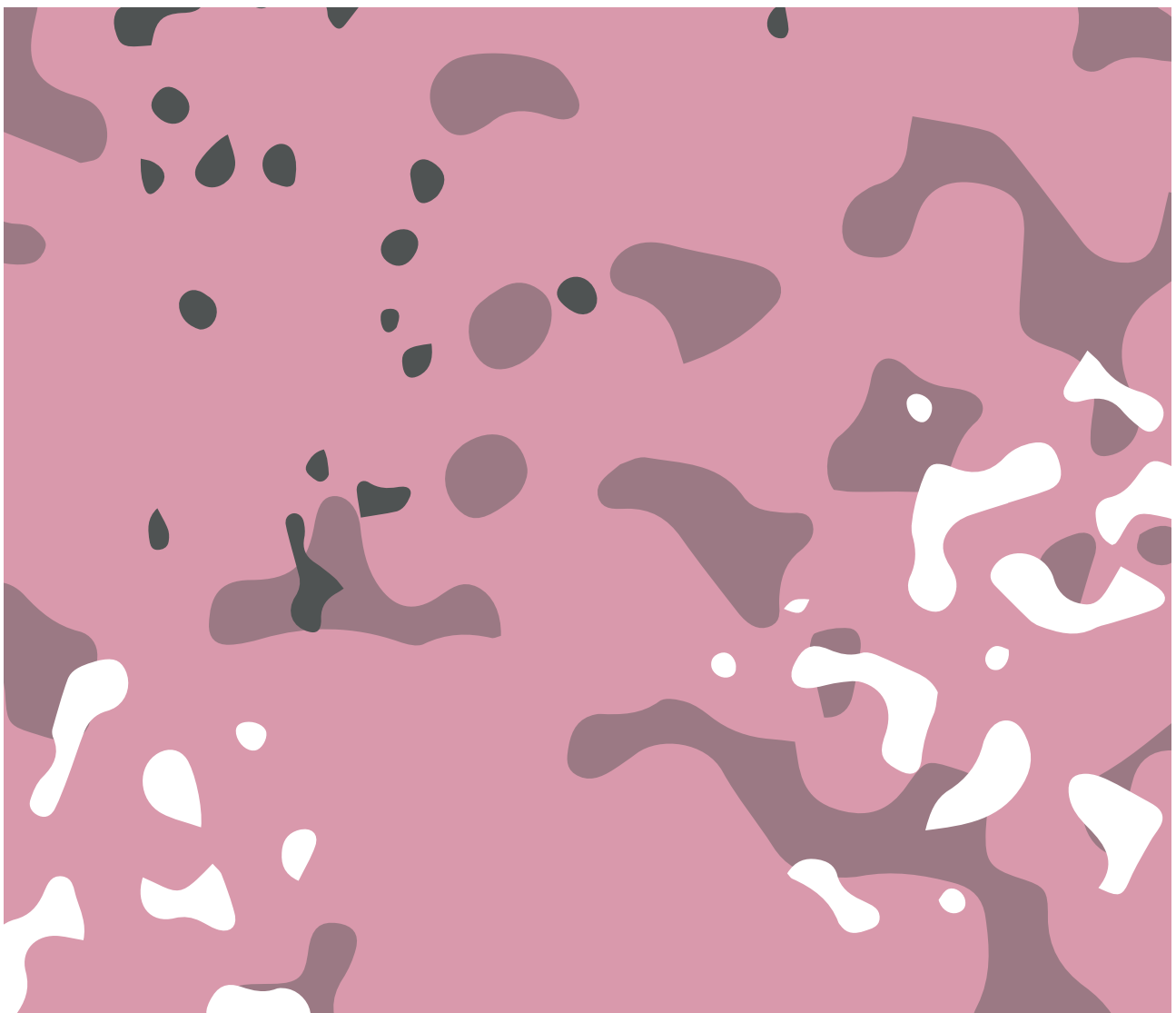


# Health misinformation

In Africa, Latin America and the UK:  
impacts and possible solutions



A JOINT BRIEFING FROM:



# About this briefing

Misinformation causes real harm to people's lives, health, finances and to democracy. We need good evidence on how to tackle it. This briefing is part of a research programme set up by Africa Check, Chequeado and Full Fact to find that evidence and make it useful to fact checkers globally.

In this briefing Full Fact's researcher Dr. Dora-Olivia Vicol, with support from Natalie Tannous, Peter Belesiotis, Natalie Tchakerian and Ruth Stewart from the Africa Centre for Evidence, looks at the impact of misinformation on public health, and reviews the evidence on interventions. We thank Paula Szewach and Gareth Turley for their help in reviewing the evidence. We would also like to thank Dr. Briony Swire-Thompson, Prof Leticia Bode, Nat Gyenes, Simon Piatek and Gregory Maus for their gracious feedback on earlier drafts.

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# Contents

Summary .....	4
Misinformation is a question of life and death .....	6
Crises, conspiracies, and everyday myths .....	6
The sources of health misinformation .....	8
Our part in believing and sharing health misinformation .....	9
The impact of misinformation on public health .....	12
AFRICA: Polio conspiracies, Ebola crisis, everyday reproductive health myths .....	12
LATIN AMERICA: Conspiracies doubt the origins of Zika .....	14
UNITED KINGDOM AND EUROPE: Declining vaccination rates .....	15
Interventions: what has worked? .....	18
The uphill battle against vaccine conspiracies .....	18
Targeted, long term campaigns .....	25
Conclusions and recommendations: truth, trust, and tactics .....	29
Coping with crises .....	29
Tackling anti-vaccination conspiracies .....	30
Tackling everyday myths .....	31
How we selected the studies .....	33
Bibliography .....	35

## Summary

At the beginning of 2020, the Covid-19 pandemic generated by the pathogen commonly known as coronavirus sent rumour mills into a frenzy. The World Health Organization (WHO) described it as a massive infodemic, capable of drowning out reliable health guidance in an over-abundance of opinion.

And yet, health misinformation is not a peculiarity of the 2020s. From rumours in Nigeria in the early 2000s that polio vaccinations were a conspiracy, to allegations that the 2015 Zika crisis in the Americas and Asia-Pacific was man made, there is a long history of health misinformation. This briefing reviews some of the key episodes and possible solutions.

To understand how health misinformation travels, it helps to distinguish three building blocks.

- **Crises** refer to moments of radical disruption and information overload. When the simplest everyday routines are thrust into uncertainty, as it happened with the coronavirus pandemic, most members of the public tend to seek out more information. However, psychological uncertainty also makes it harder to process complexity, and more difficult to distinguish correct information from the noise. The Covid-19, Zika, and Ebola outbreaks, are three examples of crises we review.
- **Conspiracies** are a type of anti-establishment narrative. Pushed by interest groups in some cases, they are most notable for the ways in which they spread from strong believers to members of the general public, undermining official advice, and advocating potentially life-threatening alternatives. Here we focus on the anti-vaccination movement.
- **Everyday misinformation** is inherent in the homegrown remedies, beauty hacks or norms which recommend unproven and sometimes harmful treatments.

We all have a part to play in the health misinformation we believe, and share.

- When it comes to **belief**, we tend to fall for claims which are repeated, easy to process, and in alignment with our world views.
- We **share** things that are high in emotion, and health crises are a particularly emotive time.
- We struggle to notice false posts when we are **distracted** – which makes social media particularly tricky to navigate.

But in every case, something can be done: with truth, trust, and tactics.

- Misinformation crises can be tackled with **clear, concise advice, delivered promptly by trusted sources.**

- Anti-vaccination conspiracies are **extremely complex to counter**. Even though, in theory, all we need is the right information, there is a lot of variance in the format of a debunk, and still a lot we don't know about how debunks affect beliefs and behaviours in time. Several experiments found that belief in false claims such as the MMR/autism link, which question the safety of vaccines, could be corrected in the short term. But the only two studies which tracked participants' beliefs in time, one week after seeing the correction, found that they could actually get worse. It is also unclear whether corrections diminish unfounded but popular concerns in vaccines' side effects, and whether they improve behaviours. Most studies we reviewed found that seeing a correction had no effect on participants' intention to vaccinate, and in a couple of cases even backfired, making audiences who were already sceptical even less likely to vaccinate. This is still an emerging field, and further replication studies are needed to establish the robustness of these findings. If there is one main thing fact checkers can do in the meantime however, it is **to prevent such information from spreading**. Though it is unlikely to change the views of existing believers, marking an anti-vaccination post as false via Facebook's Third Party Fact Checking initiative, for instance, plays a role in reducing the likelihood of it influencing new audiences.
- Finally, when it comes to everyday misinformation, there is potential in long-term interventions. Tailored to reach target audiences, and developed in partnership with local stakeholders who can ensure that truth commands trust, **long-term interventions can reduce harmful everyday behaviours** such as smoking, and improve health-seeking behaviours.

This briefing marks the beginning, not the end, of a practitioners-focused guide to tackling health misinformation. We recognise the diversity of interventions and global audiences, and we acknowledge the fact that topics like anti-vaccination have received years of attention from academics and health organisations. This briefing is not intended to act as an exhaustive summary of this work. What we set out to do rather, is provide fact checkers with an introductory toolkit in how to tackle health misinformation, and highlight the important role that social dynamics play in this.

# Misinformation is a question of life and death

At the time we started working on this briefing, news that a new virus was claiming lives in the Chinese city of Wuhan was just breaking. By the time we completed it Covid-19, the disease caused by SARS-CoV-2 commonly known as the new coronavirus, had spread across most of the world. Entire countries went on lockdown, with businesses shuttering up and the public retreating indoors. But while things were coming to a standstill on the outside, the rumour mill went into overdrive.

A flurry of conspiracies, home-made remedies, and unsubstantiated DO's and DON'Ts circulated across social, and some traditional, media.<sup>1</sup> Some of them, like the claim that gargling water would kill the virus, were incorrect but relatively harmless on the surface - unless followed instead of official recommendations.<sup>2</sup> Others however, such that children were immune to the virus, were outright dangerous. Children are not immune, there have been a few cases of children dying or experiencing severe reactions - they just generally develop milder symptoms.<sup>3</sup>

Covid-19 is a recent example in a long list of “misinfodemics” – outbreaks of misinformation which come to have as real an impact upon public health, as the epidemic itself. Communicable diseases such as influenza, Zika, and Ebola, which gain a lot of public attention around moments of outbreak, but also chronic conditions such as diabetes, and treatments such as vaccines, have all spurred “alternative explanations”.<sup>4</sup>

They all matter. For the ways in which they shift the public's attention away from medical advice; and for the danger that in this state of distraction, we fall short of life-saving behaviours. This is what this briefing sets out to address.

## Crises, conspiracies, and everyday myths

To better grasp the ways in which misinformation impacts health, we found it useful to distinguish between three scenarios. These are not part of an official categorisation.

- 1 'Coronavirus: Fact-Checkers from 30 Countries Are Fighting 3 Waves of Misinformation', Poynter, 28 January 2020, [poynter.org/fact-checking/2020/coronavirus-fact-checkers-from-30-countries-are-fighting-3-waves-of-misinformation](https://poynter.org/fact-checking/2020/coronavirus-fact-checkers-from-30-countries-are-fighting-3-waves-of-misinformation).
- 2 Leo Benedictus, 'Drinking and Gargling Water Will Not Cure the New Coronavirus', Full Fact, 2020, [fullfact.org/health/gargle-salt-vinegar-water-coronavirus](https://fullfact.org/health/gargle-salt-vinegar-water-coronavirus). Ignacio Corral, 'Es falso que 'hacer gárgaras con agua tibia y sal elimina el virus'', Chequeado, 2020, [chequeado.com/el-explicador/es-falso-que-hacer-gargaras-con-agua-tibia-y-sal-elimina-el-virus](https://chequeado.com/el-explicador/es-falso-que-hacer-gargaras-con-agua-tibia-y-sal-elimina-el-virus).
- 3 Grace Rahman, 'Children Aren't Immune from the New Coronavirus', Full Fact, 2020, [fullfact.org/health/children-can-get-coronavirus](https://fullfact.org/health/children-can-get-coronavirus). María Sol Borja, '¿Cómo afecta el coronavirus a los niños?', Chequeado, 2020, [chequeado.com/el-explicador/como-afecta-el-coronavirus-a-los-ninos](https://chequeado.com/el-explicador/como-afecta-el-coronavirus-a-los-ninos).
- 4 Yuxi Wang et al., 'Systematic Literature Review on the Spread of Health-Related Misinformation on Social Media', *Social Science & Medicine* 240 (1 November 2019): 112552, [doi.org/10.1016/j.socscimed.2019.112552](https://doi.org/10.1016/j.socscimed.2019.112552).

What they do, rather, is point to the different ways in which health misinformation can arise and take hold of public debate. In practice, they can and do occur simultaneously.

**Crises can cripple our capacity to process complexity.** In many respects, the Covid-19 epidemic articulated a crisis: an extraordinary time of disruption, similar to what occurred around the outbreak of Zika, Ebola, and other highly contagious diseases. According to the Centers for Disease Control and Prevention (CDC), crises have a power to affect the ways in which people process, and act upon, information.<sup>5</sup> Gripped by uncertainty and fear, people in crisis tend to actively look for information, but also experience a paradoxical reduction in their ability to process complexity. This, and a well-documented aversion to ambiguity,<sup>6</sup> makes it particularly difficult for nuanced points to stand out from kneejerk reactions. Several studies have found that people have widely different abilities to interpret numerical probability, and even good science can be badly understood.<sup>7</sup> The best thing health officials and information providers can do in times of crisis, according to the CDC, is fashion simple messages, and get them out early and consistently, using sources and channels that people trust.

**Conspiracies undermine the medical consensus.** When we talk about conspiracies, we are referring to wildly unsubstantiated allegations; narratives of secret deals and hidden intentions, which disregard official evidence, and usually accuse authorities of malicious motives. At times, conspiracies stem from orchestrated disinformation campaigns. A well-documented example in this sense is the 1980s claim that HIV was a man-made virus.<sup>8</sup> Subsequent analyses have shown that this HIV myth was a KGB invention designed to undermine US influence in Africa in the context of Cold War politics. Long before the myth was busted however, it spread. In fact, the most enduring conspiracies are the ones which take on a life of their own, beyond their original authors. Anti-vaccination conspiracies are a case in point. Despite the overwhelming evidence that vaccines save millions of lives a year, vaccine hesitancy constitutes one of the world's top 10 major public health risks.<sup>9</sup> This is something we examine in the briefing.

**Everyday advice.** Finally, it is important to remember that health misinformation can also take the banal, everyday forms of unsubstantiated beauty or dieting advice,

5 CDC, 'Psychology of a Crisis' (Atlanta: Centers for Disease Control and Prevention, 2019), [emergency.cdc.gov/cerc/ppt/CERC\\_Psychology\\_of\\_a\\_Crisis.pdf](https://emergency.cdc.gov/cerc/ppt/CERC_Psychology_of_a_Crisis.pdf).

6 Gideon Keren and Léonie EM Gerritsen, 'On the Robustness and Possible Accounts of Ambiguity Aversion', *Acta Psychologica* 103, no. 1-2 (1999): 149-172.

7 Andrew Mauboussin and Michael J. Mauboussin, 'If You Say Something Is "Likely," How Likely Do People Think It Is?', *Harvard Business Review*, 3 July 2018, [hbr.org/2018/07/if-you-say-something-is-likely-how-likely-do-people-think-it-is](https://hbr.org/2018/07/if-you-say-something-is-likely-how-likely-do-people-think-it-is).

8 Select Committee on Intelligence, 'Report of the Select Committee on Intelligence, United States Senate, on Russian Active Measures Campaigns and Interference in the 2016 U.S. Election. Volume 2: Russia's Use of Social Media', 2019, [intelligence.senate.gov/sites/default/files/documents/Report\\_Volume2.pdf](https://intelligence.senate.gov/sites/default/files/documents/Report_Volume2.pdf).

9 WHO, 'Ten Health Issues WHO Will Tackle This Year', 2019, [who.int/news-room/feature-stories/ten-threats-to-global-health-in-2019](https://www.who.int/news-room/feature-stories/ten-threats-to-global-health-in-2019).

alternative cures, or even moral norms. One example we explore in this briefing, is the stereotype that contraception signals promiscuity. From skin bleaching treatments rooted in problematic assumptions about beauty, to homegrown remedies to Covid-19, there is hardly a week without fact checkers intercepting misguided health advice. The damage they cause is sometimes irreparable. Doctors in Nigeria, for instance, debunked a treatment which advised sufferers of conjunctivitis to pour diluted battery acid in their eyes.<sup>10</sup> In other instances, the harm derived from everyday advice is hidden under the guise of “traditional norms”. But they matter: for the ways in which they reproduce unrealistic expectations of our bodies, and for the physical harm they cause when followed.

## The sources of health misinformation

Heidi J. Larson, professor of anthropology and director of the Vaccine Confidence Project at the London School of Hygiene and Tropical Medicine, draws a distinction between several proponents of misinformation.<sup>11</sup>

On one hand, there is **bad science**. A number of actors who hold some medical credentials, such as the infamous former physician Andrew Wakefield who popularised the myth around MMR vaccines and autism, have made affirmations unwarranted by evidence, and unverified by the scientific community.

Then there are **interest groups**. There is a lot of money to be made in selling books, services, and other products questioning medical evidence, or proposing alternative therapies.

Equally, we would add, misinformation can be used by state actors to undermine democracy – this is where it crosses the boundary into ‘disinformation’. If the KGB-generated HIV conspiracy was an artefact of Cold War politics, Covid-19 has triggered hundreds of similarly politicised theories. At the time of writing, EUvsDisinfo, an EU funded project which monitors Kremlin-backed interventions in the media of EU and Eastern Partnership countries, had tracked hundreds of coronavirus related falsehoods.<sup>12</sup>

Finally, we have the **‘super-spreaders’** – individuals who, knowingly or not, propagate misinformation through social media, where they come to reach thousands more viewers.

This is where we all play a part – in what we believe, and in the information we share.

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10 Peter Cunliffe-Jones, ‘(Awaiting Publication)’, *Political Quarterly*, 2020.

11 Heidi J. Larson, ‘The Biggest Pandemic Risk? Viral Misinformation’, *Nature* 562, no. 7727 (16 October 2018): 309–309, [doi.org/10.1038/d41586-018-07034-4](https://doi.org/10.1038/d41586-018-07034-4).

12 EUvsDisinfo, ‘Disinformation Cases’, *EU vs DISINFORMATION* (blog), 2020, [euvsdisinfo.eu/disinformation-cases](https://euvsdisinfo.eu/disinformation-cases).



## Our part in believing and sharing health misinformation

**Some of us are particularly prone to believing in conspiracies.** For a section of the public, conspiratorial ideation is a worldview – a way of interpreting events through filters of suspicion and mistrust, which can give rise to wildly imaginative alternative explanations where powerful hidden forces harbour harmful intentions.<sup>13</sup> Psychologists do not know yet what explains it. With the exception of feelings of threat and powerlessness, demographic and pathological profiles remain elusive. What we do know however, is the fact that a predisposition to conspiracy shapes susceptibility to harmful health misinformation. An analysis of over 5,000 participants in 24 countries found that anti-vaccination attitudes were most pronounced among those who, by order of magnitude, were: inclined to believe in conspiracies, hypersensitive to infringements on personal freedoms, disgusted by blood and needles, and to a lesser extent, supportive of individualistic/hierarchical worldviews.<sup>14</sup> Convinced conspiracy supporters are also most resistant to change. A study of misinformation about the Zika virus found that, although corrections could lower erroneous beliefs across the board, participants high in conspiratorial ideation were less likely to find them credible.<sup>15</sup> In their guide to addressing anti-vaccination arguments, the WHO draws a distinction between “vocal deniers”, who have a near zero probability to change their views, “refusers”, who have a low probability, and “hesitant individuals”, who are most likely to have their minds changed.<sup>16</sup> When dealing with the anti-vaccination movement, the WHO notes, it is important to remember that the target is the general public, not the small group of convinced deniers.

Beyond the niche of strong conspiracy supporters however, we can *all* fall for, and fight against, inaccurate health advice.

**We are prone to believing information we hear repeated.** Our briefing on Who Believes and Shares Misinformation, illustrated how belief formation is influenced by our worldviews, ease of processing, and repetition in particular.<sup>17</sup> This is what psychologists refer to as the “illusory truth effect”.<sup>18</sup> This is something that can be

13 Marc Kreidler, ‘Crazy Beliefs, Sane Believers: Toward a Cognitive Psychology of Conspiracy Ideation | Skeptical Inquirer’, 1 January 2015, [skepticalinquirer.org/2015/01/crazy-beliefs-sane-believers-toward-a-cognitive-psychology-of-conspiracy-id](https://skepticalinquirer.org/2015/01/crazy-beliefs-sane-believers-toward-a-cognitive-psychology-of-conspiracy-id).

14 Matthew J. Hornsey, Emily A. Harris, and Kelly S. Fielding, ‘The Psychological Roots of Anti-Vaccination Attitudes: A 24-Nation Investigation.’, *Health Psychology* 37, no. 4 (2018): 307.

15 Leticia Bode and Emily K. Vraga, ‘See Something, Say Something: Correction of Global Health Misinformation on Social Media’, *Health Communication* 33, no. 9 (2018): 1131–1140.

16 WHO, ‘How to Respond to Vocal Vaccine Deniers in Public Health.’ (Copenhagen: World Health Organization Regional Office for Europe, 2016).

17 Dora-Olivia Vicol, ‘Who Believes and Shares Misinformation?’ (London: Full Fact, 2020), [fullfact.org/media/uploads/who-believes-shares-misinformation.pdf](https://fullfact.org/media/uploads/who-believes-shares-misinformation.pdf).

18 Dora-Olivia Vicol, ‘Who Believes and Shares Misinformation?’ (London: Full Fact, 2020), [fullfact.org/media/uploads/who-believes-shares-misinformation.pdf](https://fullfact.org/media/uploads/who-believes-shares-misinformation.pdf).

particularly amplified on social media. A study of network dynamics, for instance, found that closed groups with strong views can make rumours appear like common sense.<sup>19</sup> When a small number of opinion leaders are connected to a large number of followers, but followers themselves lack sufficient other connections to offer clarity by contrast, the views held by a few highly popular individuals can become accepted through a “majority illusion”.

**We are drawn to content that is high in emotion.** Studies which investigated the type of content that gets most shares, found that stories which produced strong emotional reactions, such as fear or joy, were more likely to be spread than information-only content.<sup>20,21</sup> Health crises are particularly charged moments, when emotive stories can be amplified by the public’s general state of alertness. It is important to be mindful of our reactions to emotion.

**We are less able to discern truth value when we are distracted.** A recent, yet to be peer reviewed experiment conducted with a sample of 853 adults, quota-matched to the age, gender, ethnicity, and geography of the general US population, found that many people share false claims because they fail to think about what is true.<sup>22</sup> The study looked at a set of 15 true, and 15 false claims about Covid-19, presented in the format of a Facebook post. Interested in discovering the role of veracity, the authors asked one group of participants to think about the accuracy of the claims, while instructing another to simply choose which claims they were likely to share. This group were deliberately not given any explicit questions about the posts’ accuracy, to determine whether this was something they would consider of their own accord, when choosing what to share. The findings were revealing. While most people in the group asked to rate accuracy could tell when claims were false, almost half of respondents in the other group were willing to share them. The study is echoed by a wide body of literature which documents the limits of attention.<sup>23</sup> In the same way that no one can really multi-task successfully, it may well be that, when our attention is focused on sharing, we forget to think about what’s true.

Above all, we need trust. Adherence to health information is not just a matter of empirical truth, but also of trust. Social networks and the media have their share of responsibility in the reproduction of inaccurate content, as do our psychological predispositions. However, the social acceptance of this content is also shaped by how ordinary citizens perceive the pharmaceutical companies, development organisations,

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19 Kristina Lerman, Xiaoran Yan, and Xin-Zeng Wu, ‘The “Majority Illusion” in Social Networks’, *PLOS ONE* 11, no. 2 (17 February 2016): e0147617, [doi.org/10.1371/journal.pone.0147617](https://doi.org/10.1371/journal.pone.0147617).

20 William J. Brady et al., ‘Emotion Shapes the Diffusion of Moralized Content in Social Networks’, *Proceedings of the National Academy of Sciences* 114, no. 28 (2017): 7313–7318.

21 Jonah Berger, ‘Arousal Increases Social Transmission of Information’, *Psychological Science* 22, no. 7 (2011): 891–893.

22 Gordon Pennycook et al., ‘Fighting COVID-19 Misinformation on Social Media: Experimental Evidence for a Scalable Accuracy Nudge Intervention’, 17 March 2020, [doi.org/10.31234/osf.io/uhbk9](https://doi.org/10.31234/osf.io/uhbk9).

23 Daniel J. Levitin, *The Organized Mind Thinking Straight in the Age of Information Overload* (London: Penguin, 2014).

and authorities involved in the production and administration of health advice.<sup>24</sup> Studies which review interventions in health crises, such as Ebola,<sup>25</sup> but also adherence to long-established medical consensus around vaccination,<sup>26</sup> make this clear. Preventing the harm from health misinformation is not just a matter of getting facts right in the moment. It is also a matter of earning the public's trust in the long term.

## Where next?

This briefing sets out to do two things. First, it is to situate the recent Covid-19 epidemic in the long history of health misinformation across the world. The studies we review show that misinformation can hinder public authorities' abilities to deal with health crises, such as the Ebola virus and Zika, but also perpetuate conspiracies regarding vaccination, AIDS, and long-running assumptions about sexual and reproductive health.

The second ambition is to evaluate the effectiveness of interventions such as corrections and long-term interventions, with a view to provide fact checkers with practical recommendations.

Given the scope of this briefing, we see our recommendations as tentative. We recognise the diversity of audiences, medical, and media environments, and the necessity to tailor interventions. What we seek to communicate, is the importance of tackling health misinformation as a key source of harm.

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24 Annie Wilkinson and Melissa Leach, 'Briefing: Ebola—Myths, Realities, and Structural Violence', *African Affairs* 114, no. 454 (2015): 136–148.

25 Wilkinson and Leach.

26 Edward Mills et al., 'Systematic Review of Qualitative Studies Exploring Parental Beliefs and Attitudes toward Childhood Vaccination Identifies Common Barriers to Vaccination', *Journal of Clinical Epidemiology* 58, no. 11 (2005): 1081–1088.

# The impact of misinformation on public health

## AFRICA: Polio conspiracies, Ebola crisis, everyday reproductive health myths

Africa has faced many public health crises, and continues to face a range of challenges. The poor take-up of vaccinations in Nigeria, and the struggle to contain the 2014 Ebola outbreak in West Africa are two challenges which illustrate the dynamics of conspiracy and crisis. But everyday forms of health misinformation also abound, particularly around sexual and reproductive health. This section examines them in detail.

### Polio vaccinations

In 1988 the WHO launched the Global Polio Eradication Initiative (GPEI). A “Kick Polio Out of Africa” initiative spearheaded by Nelson Mandela in 1996 instituted National Immunization Days, training with community health workers, and high profile media campaigns hoping to eradicate polio for good.<sup>27</sup> By 2003, the GPEI launched what it hoped to be the final onslaught against polio. Nigeria was of particular concern, being the site of 45% of all polio cases worldwide, and 80% of cases in Africa.<sup>28</sup> This was believed to be due to poor vaccine coverage during previous control campaigns. Unfortunately however, efforts were disrupted. Political and religious leaders in three Northern Nigeria states brought the immunisation campaign to a halt when they claimed that the vaccine was contaminated with anti-fertility agents, HIV, and cancerous agents.

The reasons for this stance were complex, and provide a stark illustration of the importance of trust. The action against polio, commentators argued, did not emerge in isolation. One source of mistrust was the tension between state and federal authorities.<sup>29</sup> Another contributing factor was likely the history of past interventions, stained by invasive attempts at population regulation undertaken in the 1980s under President Babangida’s administration, but also by the association between Western health interventions and colonial occupation.<sup>30</sup>

For all the complexity however, the damage was done. Polio vaccinations were boycotted in the three states for a total of 11 months. Though the political impasse was resolved eventually, a fresh outbreak of a new strand of polio was reported in Northern

27 Ayodele Samuel Jegede, ‘What Led to the Nigerian Boycott of the Polio Vaccination Campaign?’, *PLoS Medicine* 4, no. 3 (2007): 0417.

28 Elisha Renne, ‘Perspectives on Polio and Immunization in Northern Nigeria’, *Social Science & Medicine* 63, no. 7 (2006): 1857–1869.

29 Jegede, ‘What Led to the Nigerian Boycott of the Polio Vaccination Campaign?’

30 Renee Elisha, P., *Polio Vaccination, Political Authority and the Nigerian State, The Politics of Vaccination* (Manchester University Press, 2017), [manchesteropenhive.com/view/9781526110916/9781526110916.00020.xml](http://manchesteropenhive.com/view/9781526110916/9781526110916.00020.xml).

Nigeria in October 2003, and subsequently in other west and central African countries, and even Yemen, Saudi Arabia and Indonesia, where the virus was believed to be carried by pilgrims and migrant workers. Perhaps most notably, the virus returned even to places which had been declared polio free.<sup>31</sup>

## Ebola virus

The WHO described the 2014 Ebola virus outbreak as West Africa’s “most severe acute public health emergency in modern times”.<sup>32</sup> Delays in the declaration of an outbreak, a lack of resources, and suddenly-overwhelmed health systems played a crucial part in the spread of the fever. However, rumours, misinformation, and unfounded assumptions added to the crisis.

Rumours that medical teams were responsible for, rather than fighting back against, the deaths of patients prompted some communities to shut themselves off. Patients were removed from health facilities, and treatment centres were attacked. Many patients avoided isolation units altogether.<sup>33</sup> In December 2014, a team from the Centers for Disease Control and Prevention and Liberia’s Ministry of Health conducted a rapid anthropological assessment in the county surrounding the Liberian capital, Monrovia, to understand why a large number of people had died from Ebola at home rather than in treatment centres.<sup>34</sup>

Focus group discussions with community leaders and residents revealed that there was an initial disbelief that Ebola was even real. A combination of conspiracy theories which circulated via word of mouth, local papers and the internet, together with beliefs in supernatural causes, and the fact that the symptoms of the disease resembled those of other less severe diseases, were all invoked as reasons why Ebola was initially believed to be fake. According to figures from the CDC updated in 2016 the disease had killed over 11,000 and infected 15,000.<sup>35</sup> It crippled families, health systems, livelihoods, food supplies and economies in its wake.

## Sexual and reproductive health

It is important to remember that health misinformation is not only about the conspiracy theories and crises which generate a lot of media attention. It is also

31 Jegede, ‘What Led to the Nigerian Boycott of the Polio Vaccination Campaign?’, 0420.

32 Annie Wilkinson and Melissa Leach, ‘Briefing: Ebola–Myths, Realities, and Structural Violence’, *African Affairs* 114, no. 454 (2015): 136–148.

33 Wilkinson and Leach, ‘Briefing’

34 Denise Roth Allen et al., ‘Understanding Why Ebola Deaths Occur at Home in Urban Montserrado County, Liberia’ (Centre for Disease Control and Prevention, 2015), [ebola-anthropology.net/wp-content/uploads/2015/07/FINAL-Report-to-Liberia-MoHUnderstanding-Why-Ebola-Deaths-Occur-at-Home-Liberia](http://ebola-anthropology.net/wp-content/uploads/2015/07/FINAL-Report-to-Liberia-MoHUnderstanding-Why-Ebola-Deaths-Occur-at-Home-Liberia).

35 CDC, ‘2014–2016 Ebola Outbreak in West Africa | History | Ebola (Ebola Virus Disease) | CDC’, 17 March 2020, [cdc.gov/vhf/ebola/history/2014-2016-outbreak/index.html](https://www.cdc.gov/vhf/ebola/history/2014-2016-outbreak/index.html).

about the everyday practices of disciplining our bodies - in ways which might uphold culturally constituted standards of beauty or moral propriety, but which come to expose us to physical and psychological harm.

Public health campaigns relating to sexual and reproductive health in Africa are a case in point. Contraception use in Nigeria has been hindered by myths about high costs and promiscuity, especially among those who discussed the topic with religious leaders.<sup>36</sup> When family planning was discussed with spouses, friends and health workers, contraception-use increased. Socioeconomic status and region of residence also played a significant role: those living in rural areas and who were poorly educated were less likely to use contraceptives. This shows the importance of the source of information for people making healthcare decisions for themselves or their families.

### LATIN AMERICA: **conspiracies doubt the origins of Zika**

The 2015 Zika virus outbreak caused international alarm when the Pan American Health Organization and the WHO warned that infection is associated with congenital malformations such as microcephaly. Spotted in Brazil in March, within a few months reports of Zika infection had emerged in more than 20 countries from South America, Africa, Asia and the Pacific islands, as well as the US.<sup>37</sup> The absence of a treatment and the rapid transmission of the virus through mosquito bites and sexual contact, were key factors in the moral panic generated by the outbreak. It did not help, however, that a raging epidemic was clouded by rumours and misinformation online.

A team of researchers spent a week retrieving Facebook posts and videos containing the words Zika and virus.<sup>38</sup> Though overall, the majority (81%) of content identified had useful information, the posts and videos with misinformation had a significantly higher rate of audience engagement than those with official information. A press release by the WHO, the most popular of accurate posts, had 43,000 views and 964 shares. This was just a fraction of the 530,000 views and more than 19,600 shares recorded for a misleading video, which claimed to show “10 reasons why Zika virus fear is a fraudulent medical hoax”. Citing no evidence whatsoever, the video portrayed Zika as a conspiracy of governments, the vaccine and chemical industry, implying that viewers needn’t worry about hospitalisation.

We cannot know exactly how audiences of this particular video were affected. Various factors play a role in human behaviour in times of crisis. What we do know however, is that it is not an isolated case. Conspiracy theories directed at institutions were

36 Augustine Ankomah, Jennifer Anyanti, and Muyiwa Oladosu, ‘Myths, Misinformation, and Communication about Family Planning and Contraceptive Use in Nigeria’, *Journal of Contraception*, 2011, 95–105.

37 Mary Kay Kindhauser et al., ‘Zika: The Origin and Spread of a Mosquito-Borne Virus’, *Bulletin of the World Health Organization* 94, no. 9 (2016): 675.

38 Megha Sharma et al., ‘Zika Virus Pandemic—Analysis of Facebook as a Social Media Health Information Platform’, *American Journal of Infection Control* 45, no. 3 (2017): 301–302.

frequently discussed online on Instagram and Twitter.<sup>39</sup> The rumours circulated ranged from the misleading but innocuous, such as that only one condom brand was able to protect against the sexual Zika transmission, when in fact any could,<sup>40</sup> to outright fabrications claiming that Zika is a hoax.<sup>41</sup>

It is important to note that, in their totality, unsubstantiated conspiracy theories contribute to a culture of mistrust. There is a danger that pictures, videos and posts which cast doubt on public authorities' interpretations, shift belief away from medical science – and with it, that the public moves away from lifesaving recommended behaviours. This is what we turn to next.

### UNITED KINGDOM AND EUROPE: **declining vaccination rates**

Although vaccinations save 3 million lives each year, the WHO states that vaccine scepticism is one of the world's top 10 major public health risks.<sup>42</sup> A large-scale study of attitudes to immunisation across 144 countries found that in 2018, only 79% of people shared the scientific consensus that vaccines are safe.<sup>43</sup> This was particularly the case in high income countries where, despite relatively high levels of schooling and good access to health services, safety concerns were most pronounced. Just 72% of people in North America, 59% of those in Western Europe, and a worrying 40% in Eastern Europe thought vaccines were safe.

The UK is a case in point. The best-known contributor to vaccine scepticism in the UK is the publication led by Andrew Wakefield in 1998, claiming a link between the Measles, Mumps and Rubella (MMR) vaccine and autism, on the basis of observations with just 12 children.<sup>44</sup> That paper has long been retracted, and Wakefield lost his medical license. In 2010, Britain's General Medical Council ruled that the children had been carefully selected, and Wakefield had acted unethically. He had failed to disclose the fact that a portion of the research had been funded by lawyers acting for parents who were involved in lawsuits against vaccine manufacturers,<sup>45</sup> and further investigations published in the *British Medical Journal* revealed deliberate fraud.<sup>46</sup>

39 E. K. Seltzer et al., 'Public Sentiment and Discourse about Zika Virus on Instagram', *Public Health* 150 (2017): 170–175.

40 Seltzer et al.

41 Wang et al., 'Systematic Literature Review on the Spread of Health-Related Misinformation on Social Media'.

42 WHO, 'Ten Health Issues WHO Will Tackle This Year'.

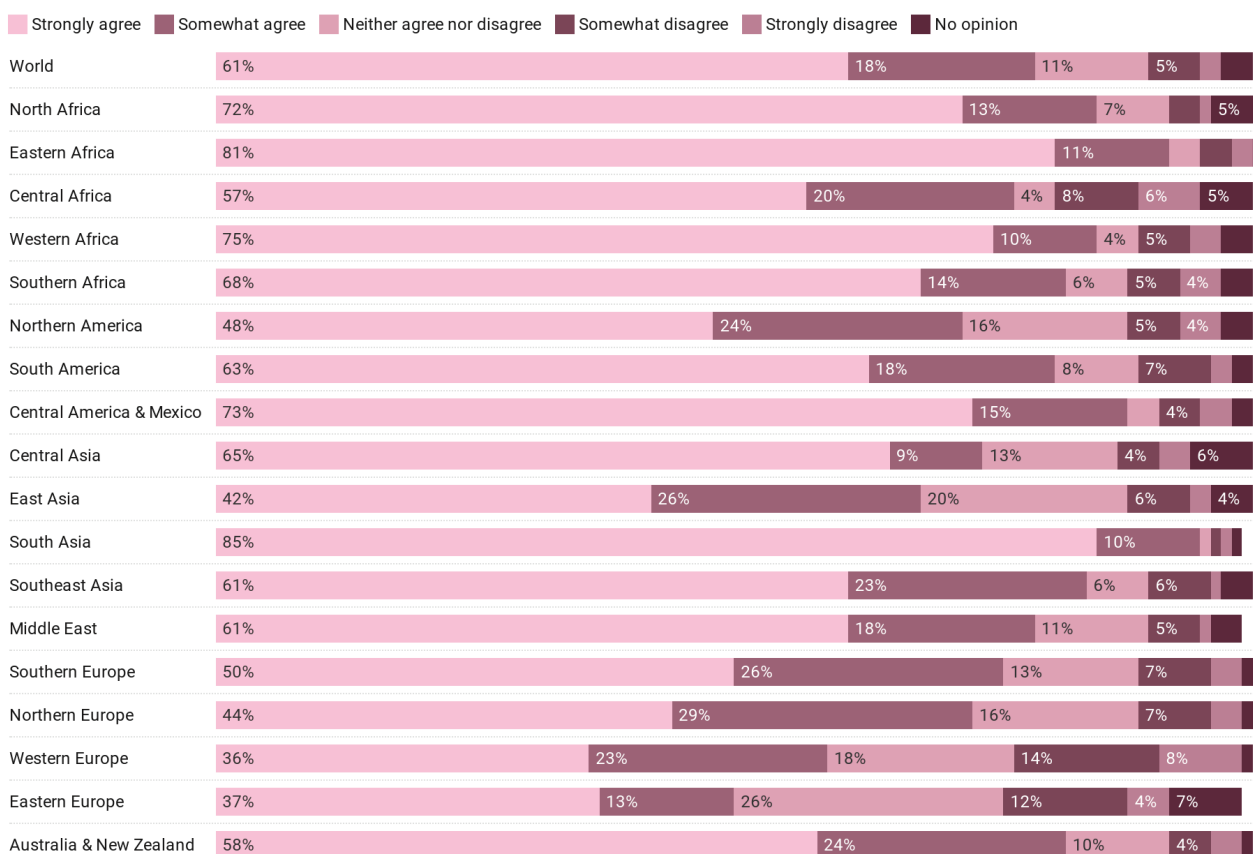
43 Wellcome Trust, 'Chapter 5: Attitudes to Vaccines', Wellcome Global Monitor 2018 (London: Wellcome Trust, 2018), [wellcome.ac.uk/reports/wellcome-global-monitor/2018/chapter-5-attitudes-vaccines](https://wellcome.ac.uk/reports/wellcome-global-monitor/2018/chapter-5-attitudes-vaccines).

44 David C. Burgess, Margaret A. Burgess, and Julie Leask, 'The MMR Vaccination and Autism Controversy in United Kingdom 1998–2005: Inevitable Community Outrage or a Failure of Risk Communication?', *Vaccine* 24, no. 18 (2006): 3921–3928.

45 Laura Eggertson, 'Lancet Retracts 12-Year-Old Article Linking Autism to MMR Vaccines', *CMAJ: Canadian Medical Association Journal* 182, no. 4 (9 March 2010): E199–200, [doi.org/10.1503/cmaj.109-3179](https://doi.org/10.1503/cmaj.109-3179).

46 Fiona Godlee, 'The Fraud behind the MMR Scare', *BMJ* 342 (6 January 2011), [doi.org/10.1136/bmj.d22](https://doi.org/10.1136/bmj.d22).

## Perceived safety of vaccines by region



Percentage of people who answered 'strongly agree', 'somewhat agree', 'neither agree nor disagree', 'somewhat disagree', 'strongly disagree', or 'no opinion'. Do you agree, disagree or neither agree nor disagree with the following statement? Vaccines are safe.

Source: Wellcome Global Monitor - Part of the Gallup World Poll 2018 - Created with Datawrapper

And yet, the damage has been long lasting.

Figures from the Nuffield Trust, an independent health think tank, indicate that between 1994 and 1995, the rate of MMR vaccination for children in the UK was relatively steady, at around 91%.<sup>47</sup> Uptake decreased significantly since the publication of the discredited article.

By 2003, only 80% of British children were vaccinated - far below the 95% immunisation rate recommended by the WHO. Coverage recovered after the paper was retracted, going up to 93% in 2013-2014. Since then however, fewer children were vaccinated every year.<sup>48</sup> Notably, declining rates of immunisation were accompanied by rising rates of infection. The latest provisional data from the Nuffield Trust, which refers to 2018, indicate 968 laboratory-confirmed measles cases in England. This is a steep rise from the 283 cases confirmed in 2017. Similar increases apply for mumps.

47 'Vaccination Coverage for Children and Mothers', The Nuffield Trust, 24 February 2019, [nuffieldtrust.org.uk/resource/vaccination-coverage-for-children-and-mothers-1](https://nuffieldtrust.org.uk/resource/vaccination-coverage-for-children-and-mothers-1).

48 'Vaccination Coverage for Children and Mothers'.



The decline in vaccination rates is not unique to the UK. The WHO declared that four European countries lost their measles-free status in the last three years. These were the UK, Albania, the Czech Republic and Greece.<sup>49</sup> And while the causes are complex, involving health systems, social determinants and societal challenges, vaccine hesitancy also plays a part.

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49 WHO, 'European Region Loses Ground in Effort to Eliminate Measles' (World Health Organization, 29 August 2019), [euro.who.int/en/media-centre/sections/press-releases/2019/european-region-loses-ground-in-effort-to-eliminate-measles](https://euro.who.int/en/media-centre/sections/press-releases/2019/european-region-loses-ground-in-effort-to-eliminate-measles).

## Interventions: what has worked?

Public health communication has received a huge amount of attention from academics, national health authorities, and international organisations such as the WHO.

The effectiveness of interventions varies widely according to the type of intervention, the health issue in question, and the extent to which it has gripped the public imagination.

In theory, all it takes is the right information. When it comes to real diseases and long-running myths however, correcting belief and altering behaviour is profoundly more complex.

This section reviews two main areas of intervention. First, we look at the uphill battle against vaccine misinformation. Then we review some of the evidence for tackling everyday health myths, with the help of long-term campaigns.

### The uphill battle against vaccine conspiracies

In theory, all we need is the right information. A lab experiment conducted in the US with a sample of 700 adults asked participants to consider a hypothetical health crisis in the form of an infectious influenza outbreak that affected two US citizens.<sup>50</sup> Respondents were instructed to then spend 30 seconds reading an example of “misinformation” which doubted the severity of the threat, and were then allocated to either a control group, or six stimulus groups where they saw different versions of a correction.

Unsurprisingly perhaps, all corrections were effective in this case. Participants doubted the severity of the crisis when they saw a piece of misinformation, but moderated these beliefs after they saw a correction.

This, however, was just an imagination exercise. Evidence from experiments with real diseases which have taken a firm grip of public debate, present a much more complicated picture.<sup>51</sup>

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50 Toni G. L. A. van der Meer and Yan Jin, ‘Seeking Formula for Misinformation Treatment in Public Health Crises: The Effects of Corrective Information Type and Source’, *Health Communication*, 14 February 2019, 1–16, [doi.org/10.1080/10410236.2019.1573295](https://doi.org/10.1080/10410236.2019.1573295).

51 See the spreadsheet we have created for [an overview of studies on misinformation about vaccines](#),

## Countering claims about real vaccines

Studies which test the impact of corrections on claims about real vaccines generally examine three variables: participants' belief in unfounded claims that question vaccines' safety, such as the long-debunked myth about the MMR jab and autism; their belief in claims about side effects, which exaggerate their prevalence or seriousness; and finally participants' intention to vaccinate themselves, or their children, in practice.

Looking at the evidence in sum, it is fair to say that it presents a complex and fragmented picture. First, the effectiveness of corrections varies widely with their format. While text-based explanations which debunk myths have been found to generally work, in two studies about the flu vaccine and one about the MMR/autism link, most experiments with fear-evoking text or visual corrections found that they either make no difference in participants' beliefs, or backfire - making a small group of convinced vaccine deniers even more entrenched in their positions. Second, we don't know how beliefs change in time. The only two studies we have come across where belief is tracked in time, find that concerns with vaccine safety get worse after a week. Finally, there is the issue of intention. Only one among the six studies which report disaggregated figures on this outcome find an improvement in participants' likelihood to vaccinate. Let us take them in turn.

### Format – best to avoid fear inducing materials

The format and tone of materials used to correct misinformation about vaccines varies widely. For instance, one experiment conducted in the US and centred on the MMR/autism link presented one group of participants with textual information explaining the lack of any evidence behind this claim. It showed another group a text about the dangers of the diseases, while presenting group three with images of sick children, and group four with a dramatic narrative of a child who almost died of measles.<sup>52</sup> Another experiment, also on the MMR/autism link, tested a booklet that debunked 10 common myths, an infographic that highlighted the difference between the huge risks derived from the disease, and the tiny possibility of side effects from vaccination, and again images of sick children.<sup>53</sup>

One finding that emerges with relative clarity from all the interventions is that fear-inducing materials are best avoided. Only one of the four studies which tested this type of correction found a positive impact, on an aggregate metric that combined belief

52 Brendan Nyhan et al., 'Effective Messages in Vaccine Promotion: A Randomized Trial', *Pediatrics* 133, no. 4 (2014): e835–e842.

53 Sara Pluviano, Caroline Watt, and Sergio Della Sala, 'Misinformation Lingers in Memory: Failure of Three pro-Vaccination Strategies', *PLoS One* 12, no. 7 (2017).

in vaccine safety and intention.<sup>54</sup> All others found that fear-based materials ranged from having no significant effect,<sup>55</sup> to actually making belief in false claims and side effects worse.

### **Time – we need to investigate how attitudes vary in time**

Another aspect to be mindful of is time. Measured immediately after seeing a correction, several experiments have found that textual information can lower belief in the MMR/autism link, or that the flu jab could give you the flu. But we don't know how this varies in time, and the two papers which traced this present a worrying picture.

An experiment investigated the possibility of correcting the long-running false belief in the MMR vaccine/autism link. A total of 124 students from Scottish and Italian universities were exposed to three types of corrections.<sup>56</sup> In the first strategy, participants were shown a booklet which debunked 10 common myths with 10 short explanations. The second strategy tested visual corrections. Participants were shown tables comparing the potential problems caused by MMR with the minimal potential side effects caused by its vaccine. In the third strategy, researchers tested fear-inducing corrections, by showing participants pictures of children suffering from MMR, along with a brief warning of the importance of vaccination.

**Findings from this experiment with real-world myths were considerably more modest than those from studies of fictitious diseases.**

Levels of agreement with the false information about vaccines were generally low, when measured immediately after the experimental condition. The average agreement was of 1.5 (out of a maximum of 5) among participants who saw the myth vs facts correction or the visual correction, and just under 2 after seeing the fear inducing pictures. However, belief in the myth appeared to get worse in time. Measured again a week after the intervention, agreement with the false vaccine-autism link *rose* slightly in the group who saw a visual correction, and increased substantially among those who had seen the myth-vs facts debunk.

A similar dynamic emerged around erroneous beliefs in vaccines' harmful side effects. Though levels of agreement with this myth were low at first, at 2 out of 5 across every type of correction, after one week participants' belief in harmful side effects

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54 Zachary Horne et al., 'Countering Antivaccination Attitudes', *Proceedings of the National Academy of Sciences* 112, no. 33 (2015): 10321–10324.

55 Brendan Nyhan and Jason Reifler, 'Does Correcting Myths about the Flu Vaccine Work? An Experimental Evaluation of the Effects of Corrective Information', *Vaccine* 33, no. 3 (January 2015): 459–64, [doi.org/10.1016/j.vaccine.2014.11.017](https://doi.org/10.1016/j.vaccine.2014.11.017).

56 Sara Pluviano, Caroline Watt, and Sergio Della Sala, 'Misinformation Lingers in Memory: Failure of Three pro-Vaccination Strategies', *PLoS One* 12, no. 7 (2017).

rose across the board, to 2.5 in the myths-vs-facts condition, and as much as 4 in the condition based on pictures. A second experiment with a group of 60 Italian parents recruited from paediatrics clinics found a similar dynamic.<sup>57</sup> Attitudes around vaccine safety which seemed to get better immediately after seeing a correction, turned out to get worse in time.

Evidence from this study presents fact checkers with a daunting challenge. Anti-vaccination myths are one of the most harmful sources of misinformation plaguing public debate, across the Global North in particular. As campaigners for accuracy, it is hard to stand by as myths with potentially deadly consequences spread across the public domain.

Indeed, research which investigates how audiences respond to science deniers on a radio programme, finds that giving them air space without challenging their arguments is outright dangerous, as science denialism has been found to affect both the public's attitudes and behaviour.<sup>58</sup> However, unlike a counter-argument delivered in a live debate, which intercepts and debunks the myth as soon as it reached its audience, there are challenges to how fact checkers can do this. Initiatives on social media, such as the Facebook Third Party Fact Checking initiative, help to get fact checks to where misinformation appears. Beyond these, fact checkers have to make careful decisions about where to publicise fact checks and whether publicising them can give exposure to myths which might otherwise have remained unknown.

## Correcting belief does not mean changing behaviours

Concerns about vaccine safety are not just a stubborn myth. They are also a stubborn behaviour.<sup>59</sup> A survey experiment on a sample representative of the US population set out to correct another vaccine related myth – namely, that a flu jab could give you flu, as opposed to prevent it.<sup>60</sup> As many as 43% of participants believed this when they joined the experiment. Though showing them the correct information from the Centers for Disease Control and Prevention could lower this erroneous belief, and alleviate concerns about the safety of the vaccine, they did not lead to higher intention to vaccinate. For participants who entered the experiment with “low” belief in side effects, seeing a correction had no significant effect. For those whose concerns were high, intention to vaccinate was even lower after seeing a correction.

57 Sara Pluviano et al., 'Parents' Beliefs in Misinformation about Vaccines Are Strengthened by pro-Vaccine Campaigns', *Cognitive Processing* 20, no. 3 (2019): 325–331.

58 Philipp Schmid and Cornelia Betsch, 'Effective Strategies for Rebutting Science Denialism in Public Discussions', *Nature Human Behaviour* 3, no. 9 (2019): 931–939.

59 Leticia Bode and Emily K. Vraga, 'In Related News, That Was Wrong: The Correction of Misinformation through Related Stories Functionality in Social Media', *Journal of Communication* 65, no. 4 (2015): 619–638.

60 Brendan Nyhan and Jason Reifler, 'Does Correcting Myths about the Flu Vaccine Work? An Experimental Evaluation of the Effects of Corrective Information', *Vaccine* 33, no. 3 (January 2015): 459–64, [doi.org/10.1016/j.vaccine.2014.11.017](https://doi.org/10.1016/j.vaccine.2014.11.017).

Findings from this and other experiments illustrate just how much more work we have left to do to understand the journey between what people believe, and what they do. Though this backfire effect was not replicated in a subsequent study with a younger, more educated and less concerned sample,<sup>61</sup> and generally it remains a contested finding in misinformation research,<sup>62</sup> what this and other studies of vaccine corrections indicate is that seeing a correction does not necessarily improve audiences' intentions to vaccinate.<sup>63</sup>

It is worth reviewing one more example in this sense. A web-based survey on a nationally representative sample of US parents (of children under 17) tested the effectiveness of messages designed to reduce misperceptions, and increase vaccination rates for MMR.<sup>64</sup> Participants were randomly assigned to a control group, or one of four interventions: information explaining the lack of evidence for any vaccine/autism link; textual information about the dangers of Measles, Mumps, and Rubella; images of children suffering from Measles, Mumps, or Rubella; or a dramatic narrative about an infant who almost died of measles.

None of the interventions increased their intent to vaccinate a future child. Though refuting claims of a vaccine/autism link successfully reduced misperceptions that vaccines cause autism, self-reported desire to vaccinate was even lower among parents who had the least favourable vaccine attitudes.

## Why are attitudes about vaccine safety and intention to vaccinate so difficult to counter?

Establishing this with any certainty is extremely difficult – and remains subject to investigation.<sup>65</sup> First of all, the journey from belief to behaviour is a complex and asymmetrical one. While most people who state their reluctance to vaccinate will also hold off in practice, those who state intention to vaccinate will not necessarily follow through.<sup>66</sup> Intention to vaccinate doesn't just depend on belief in the medical science, but also having the time and resources to attend a clinic, and trust in the medical establishment.

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61 Kathryn Haglin, 'The Limitations of the Backfire Effect', *Research & Politics* 4, no. 3 (2017): 2053168017716547.

62 Amy Sippitt, 'The Backfire Effect: Does It Exist? And Does It Matter for Factcheckers?' (Full Fact, 2019); Briony Swire-Thompson, Joseph DeGutis, and David Lazer, 'Searching for the Backfire Effect: Measurement and Design Considerations', 2020, [doi.org/10.31234/osf.io/ba2kc](https://doi.org/10.31234/osf.io/ba2kc).

63 Pluviano et al., 'Parents' Beliefs in Misinformation about Vaccines Are Strengthened by pro-Vaccine Campaigns'; Pluviano, Watt, and Della Sala, 'Misinformation Lingers in Memory'; Haglin, 'The Limitations of the Backfire Effect'; Nyhan et al., 'Effective Messages in Vaccine Promotion'.

64 Brendan Nyhan et al., 'Effective Messages in Vaccine Promotion: A Randomized Trial', *Pediatrics* 133, no. 4 (2014): e835–e842.

65 Sippitt, 'The Backfire Effect: Does It Exist? And Does It Matter for Factcheckers?'

66 Noel T. Brewer et al., 'Increasing Vaccination: Putting Psychological Science Into Action', *Psychological Science in the Public Interest* 18, no. 3 (1 December 2017): 163, [doi.org/10.1177/1529100618760521](https://doi.org/10.1177/1529100618760521).

There are also explanations around why corrections struggle to change audiences' beliefs. One argument is that people with high levels of scepticism will reject the evidence to defend their prior positions – this is known as the “worldview backfire”, and it is still subject to debate.<sup>67</sup> Another is that a debunk not only gives air to good information, but also to the inaccurate claims underlying it. In a sense, this is unavoidable. Previous experimental research has found that clearly stating what the inaccurate claim is before refuting it with the right information is a must, if audiences are to *update* their beliefs.<sup>68</sup> In other words, it's hard to understand that something is wrong, without knowing that that thing is first. But fact checkers in the real world also have a second choice to make – which is decide whether the claim merits the attention and visibility of a public correction at all.

One of the studies that examined the vaccine/autism link presented participants with a booklet which covered a total of 10 myths (and just as many corrections).<sup>69</sup> This may have exaggerated the amount of “evidence” behind what is in fact a singular, completely unsubstantiated allegation regarding autism.

There may also be an explanation for the deleterious effects observed in interventions with pictures of children suffering from diseases. There is an immediacy with which we process visual stimuli, particularly those high in emotive content, which can distract from the conclusions of a fact check. By contrast, in the experimental condition where participants only saw a graphic representation of the discrepancy between scientific consensus on vaccine safety, on the one hand, and the minority of vaccine sceptics, on the other hand, neither belief in the autism link, nor belief in side effects increased by as much – though a small increase was observed nonetheless.

One conclusion we can draw from this evidence base is that shocking pictures of illness are unlikely to do any good. All the evidence on vaccine corrections suggests that fear-inducing pictures increase belief in side effects, and are no better at prompting vaccination in practice.

Beyond this, however, making recommendations gets more difficult. One group of authors goes as far as suggesting that correcting anti-vaccine myths may not be the most effective approach in mitigating misperceptions.<sup>70</sup> Preventing anti-vaccination myths, it is argued, may be more effective than curing them – and in some cases, it may be the only option available.

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67 Swire-Thompson, DeGutis, and Lazer, ‘Searching for the Backfire Effect: Measurement and Design Considerations’.

68 Ullrich KH Ecker et al., ‘The Effectiveness of Short-Format Refutational Fact-Checks’, *British Journal of Psychology*, 2019.

69 Pluviano, Watt, and Della Sala, ‘Misinformation Lingers in Memory’.

70 Nyhan and Reifler, ‘Does Correcting Myths about the Flu Vaccine Work?’

## Prevention is better than cure

A study which investigated the effects of anti-conspiracy arguments found that corrections could increase intentions to vaccinate (a fictitious child), but only when presented prior to conspiracy theories.<sup>71</sup>

A total of 260 US adults, half of whom were parents, were randomly distributed across four test groups. One group saw a variant of an anti-vaccine conspiracy. Naturally, this was not labelled “conspiracy”, but was designed to reproduce the type of generic, non-referenced information people come across in everyday life (“there is a significant amount of evidence that vaccines can hurt more than they help. For example, by the year 2002, tens of thousands of reactions to vaccines, including deaths, were reported...”).

A second group saw information debunking this conspiracy, presented in a similarly neutral format (“...further, there is little evidence to suggest that vaccines are harmful. The side effects are minimal and whilst millions of people have been immunised over the years, less than .005% have ever had an adverse reaction to a vaccine...”).

Group three were shown both the conspiracy and its debunk, while the final group, number four, saw this in reverse order, with the anti-conspiracy material first. All participants were then asked to state the extent to which they agreed with statements such as “vaccines lead to allergies”, designed to test confidence in vaccine safety, but also to imagine a scenario in which they were the parents of a fictitious child suffering from a fictitious disease, and state their intention to vaccinate. A fifth ‘control’ group included no information at all.

In line with previous research in the UK,<sup>72</sup> the study found that exposing participants to conspiracy arguments increased belief in anti-vaccine theories, which also directly increased belief in the perceived dangers of vaccines, and decreased intentions to vaccinate.

By contrast, vaccination intentions improved if participants saw the anti-conspiracy material first, but not after. Beliefs become significantly more difficult to dislodge once they have taken hold of participants’ imagination.

Another intervention worth considering then, would be to go beyond the reactive practice of myth-busting interventions, and pre-empt vaccine misinformation through providing corrective information before individuals come across the misinformation.

One option of how to do this is to build partnerships with educators and health authorities, who are routinely involved in communicating information about health.

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71 Daniel Jolley and Karen M. Douglas, ‘Prevention Is Better than Cure: Addressing Anti-Vaccine Conspiracy Theories’, *Journal of Applied Social Psychology* 47, no. 8 (August 2017): 459–69, [doi.org/10.1111/jasp.12453](https://doi.org/10.1111/jasp.12453).

72 Daniel Jolley and Karen M. Douglas, ‘The Effects of Anti-Vaccine Conspiracy Theories on Vaccination Intentions’, *PLOS ONE* 9, no. 2 (20 February 2014): e89177, [doi.org/10.1371/journal.pone.0089177](https://doi.org/10.1371/journal.pone.0089177).



A systematic review summarised the outcomes of 10 face-to-face interventions conducted with parents in Australia, Canada, China, England, Japan (two studies) and the USA, as well as Nepal and Pakistan.<sup>73</sup> All interventions focused on childhood vaccinations and were conducted in natural settings such as clinics. There was considerable variance in the interventions adopted. Some were as short as 10 minutes, while others stretched for hours. Seven studies evaluated a single intervention session, while the rest included multiple sessions. Due to design limitations, reviewers judged the certainty of evidence to be low for outcomes regarding children's vaccination status, parents' attitudes, intentions to vaccinate, and belief in adverse effects, and moderate for parents' knowledge or understanding of the vaccines.

Despite the caveats however, the review provides a course of action worth exploring. There was evidence, of low to moderate certainty, suggesting that face-to-face interventions may improve children's vaccination status, slightly improve parents' understanding of vaccination, as well as slightly increase intention to vaccinate.

There is also something to learn from actions taken against other forms of health misinformation, through long-term campaigns. This is what we turn to next.

## Targeted, long term campaigns

A group of British scientists examined 36 reviews of evidence, to ascertain the effects of mass media intervention upon health-related behaviours such as tobacco use, sexual health, physical activity, illicit drug use and others.<sup>74</sup> The areas covered included the UK, as well as non-OECD countries (all of which were investigating sexual health interventions). Most campaigns involved messages broadcast in the national media, with a subset looking at regional and local media.

Overall, the study found that mass media campaigns for public health messages can work. But the evidence on behaviour change is mixed – and of variable quality.

There is strong evidence that targeted communication campaigns can encourage simple behaviours such as taking up walking to reduce the risk from a sedentary lifestyle, or wearing a condom to reduce the risk from sexually transmitted diseases. There was also some evidence that mass media campaigns could increase intention to quit smoking, and prompt audiences to access helplines that help them quit. Reflective of this, Case study 1 illustrates how long term interventions can tackle misinformation.

The evidence on campaigns is encouraging, but it must be taken with a dose of caution.

73 Jessica Kaufman et al., 'Face-to-face Interventions for Informing or Educating Parents about Early Childhood Vaccination', *Cochrane Database of Systematic Reviews*, no. 5 (2018), doi.org/10.1002/14651858.CD010038.pub3.

74 Martine Stead et al., 'Mass Media to Communicate Public Health Messages in Six Health Topic Areas: A Systematic Review and Other Reviews of the Evidence', *Public Health Research*, 2019.

For any intervention to be effective, it first needs to reach the right audience. This large-scale review found that targeting messages to specific audiences was more effective than general campaigns. Reviews of tobacco and illicit drug campaigns found that mass media was more effective for young people, and in particular younger children, than for older teenagers and adults. There was modest evidence to suggest that campaigns for tobacco, sexual health and physical activity did not differ by sex, and no clear evidence on the roles of ethnicity and socioeconomic status. Drawing on evidence from Mexico, Case study 2 illustrates the limitations of general interventions which fail to reach the right population.

Second, not every type of media is amenable to tailored communication. Instant messaging apps such as WhatsApp or Facebook Messenger remain fundamentally private. According to the 2019 Reuters Digital News report, WhatsApp constitutes a news source for 14% of adults in the UK, 39% in Argentina, and as many as 49% in South Africa.<sup>75</sup> A 2020 survey where the same authors investigated the circulation of Covid-19 news, found that the use of such applications was on the rise. A total of 18% of respondents in the UK, and 53% in Argentina talked about the pandemic on WhatsApp - even though only a minority of 12% British, and 38% Argentinians trusted the news and information they received on these channels.<sup>76</sup> Data for South Africa was not available.

Finally, simply knowing what's better for one's health is not enough. The large-scale review draws attention to the fact that health campaigns about alcohol were often recalled, but rarely lead to reductions in alcohol consumption. As an example of this, Case Study 3 illustrates the difficulty of tackling deep-rooted attitudes.

### CASE STUDY 1: **Radio campaigns in Africa improve maternal and child survival through simple behaviour change**

Development Media International, a UK-based non-profit organisation, tested whether a 35-month long radio campaign could lower child mortality by improving the health seeking behaviours of parents. Every day local radio stations in seven Burkina Faso provinces broadcast 1-minute-long features approximately 10 times. Longer 2-hour interactive programs were also broadcast 5 times a week, seeking to inform and entertain. All programs were recorded in local languages, and broadcast from 2011 to 2014.<sup>77</sup>

75 Nic Newman et al., 'Reuters Institute Digital News Report 2019' (Oxford: Reuters Institute, University of Oxford, 2019).

76 Richard Fletcher et al., 'Navigating the "Infodemic": How People in Six Countries Access and Rate News and Information about Coronavirus', Reuters Institute for the Study of Journalism, 2020, [reutersinstitute.politics.ox.ac.uk/infodemic-how-people-six-countries-access-and-rate-news-and-information-about-coronavirus](https://reutersinstitute.politics.ox.ac.uk/infodemic-how-people-six-countries-access-and-rate-news-and-information-about-coronavirus).

77 Joanna Murray et al., 'Modelling the Effect of a Mass Radio Campaign on Child Mortality Using Facility Utilisation Data and the Lives Saved Tool (LiST): Findings from a Cluster Randomised Trial in Burkina Faso', *BMJ Global Health* 3, no. 4 (2018): e000808.

A survey of listeners found that, in many respects, the intervention worked. Women in the intervention arm of the study were more likely to seek care for diarrhoea and treat their children with oral rehydration solutions, than those in the control group comprising provinces which did not broadcast the message. There were also improved behaviours for use of antibiotics in the case of difficult breathing, and for saving money during pregnancy.

Other behaviours were harder to change. There was little or no difference in habitual behaviours such as exclusive breastfeeding, hand washing with soap and use of bed nets, between the group who had listened to the health messages, and the one who had not.

Overall however, even with these limitations the authors estimate that the campaign had achieved a 7.1% reduction in child mortality (2,967 lives) and a 3% decrease in maternal mortality (39 lives). Short information bites crafted by health professionals and disseminated in local media made a step in the direction of better behaviours. Notably, they significantly increased consultations, ante-natal care, and facility deliveries.

#### CASE STUDY 2: **Mexico's anti-obesity campaign few people knew about**

In 2013, the government of Mexico launched an information campaign to warn the public against the dangers of diabetes, hypertension and other non-communicable diseases: Chécate, Mídete, Muévete (Check yourself, Measure yourself, Move yourself). Ads showcased on television, radio, print and on the internet were designed to appeal to the adult population, with a particular focus on families and women.

Literature evaluating this information is scarce. But one paper is worth mentioning. A study evaluating the effectiveness of the campaign surveyed 8,079 men and women over the age of 20. Only 11% of the surveyed population knew about the campaign, with women and those with higher education being more likely to know about the campaign. This is a worrying finding. While a more robust assessment of the intervention would be desirable, this survey suggests that there is a long way between triggering a campaign and reaching its target audience at a large scale.<sup>78</sup>

#### CASE STUDY 3: **Mexico's struggle against HIV stigma**

Another study from Mexico analysed the mass media campaigns set in place by the Mexican Council for AIDS Control and Prevention from 1987 to 1994.<sup>79</sup> The first case of

78 Araceli A. Salazar-Coronel et al., 'Knowledge and Level of Understanding of the Chécate, Mídete, Muévete Campaign in Mexican Adults', *Salud Pública de México* 60, no. 3 (2018): 356–364.

79 Blanca Rico, Mario Bronfman, and Carlos del Río, 'Las Campañas Contra El Sida En México:?' Los Sonidos Del Silencio o Puente Sobre Aguas Turbulentas?', *Salud Pública de México* 37, no. 6 (1995): 643–653.

AIDS in Mexico was diagnosed in 1983. Many public health education campaigns have been launched since, including brochures with questions and answers about AIDS, fear-inducing photos of bodies with tags on their feet reading “He died of AIDS”, and even humorous messages like match boxes showing condoms and the phrase “I do not play with fire”. There were TV spots pushing to “take off the blindfold” when talking about AIDS, and interventions targeted at specific audiences such as adolescents.

Given the financial limitations of conducting post campaign evaluations, Mexican authorities mainly evaluated public opinion before the campaigns, not after. And yet, one finding is telling. Results from focus groups and in-depth interviews conducted in 1994 revealed that, not only were participants sceptical of the preventive measure recommended, but they also had radically different expectations of what the campaign needed. Participants expressed an interest in dramatic images and narratives, such as cases of terminally ill patients – even though other interventions had found these materials to be counterproductive. In this case, the authors conclude, mass media campaigns did not change practices considerably. What they may have done, is create an environment ripe for other types of interventions, such as those emphasising that AIDS prevention depends on individual health choices.

## Conclusions and recommendations: truth, trust, and tactics

The Covid-19 infodemic which has engulfed public debate at the beginning of 2020, is but one episode in a long running history of health misinformation. Historical examples from Africa, Latin America and Europe illustrate what psychologists have argued in experimental research. To some degree, everyone is prone to believing and sharing health misinformation – be it due to a tendency for conspiratorial ideation, or the simple propensity to believing repetitive information, being influenced by emotion, or just losing track of accuracy through distraction.

If there is a single key recommendation that emerges from the vast literature we consulted, it is that tackling health misinformation takes empirical truth and earned trust. From the recent crisis generated by the coronavirus pandemic, to anti-vaccination conspiracies, trust is foundational to the ways in which the public process, and acts upon, the findings of medical science.

Beyond the imperative, however, there are also tactics of communication which fact checkers can draw upon. We follow the three scenarios we started with. It is important to note that, in practice, they intersect.

### Coping with crises

Use simple messages. Under conditions of stress and information overload, it is easy to miss, forget, or misinterpret the nuances of health and safety messages. Counter this by keeping verdicts simple: note what is right and why.

**Be consistent.** In times of crisis, many members of the public look for multiple sources of information and opinion. Stay atop this flurry of activity by keeping messaging consistent, however many channels you share them on.

**Use credible sources.** Remember that managing a crisis may require asking people to do something that seems counter-intuitive, such as not socialising to avoid contagion, self-isolating instead of seeing their GP, and only going to the hospital when they develop severe symptoms. Using trusted sources may make these messages easier to believe.

**Get there early.** Numerous experiments have shown that myths are harder to dislodge once they have been heard. Furthermore, delays in response also create more room for speculation, as people come to fill in the blanks. Relate accurate messages early and firmly, to prevent myths taking hold of the public imagination.

## Tackling anti-vaccination conspiracies

**Corrections are an uphill battle.** If there is one thing that studies reviewed here make very clear, it is that we are far from finding an effective format for correcting anti-vaccine conspiracies. When it comes to their impact on erroneous beliefs, such as that vaccines give you the flu or autism, the evidence is mixed. Though beliefs tested immediately after presenting participants with a correction showed some improvement, in both the flu and autism case, one experiment found that this could backfire in time. The evidence is also disappointing when it comes to intentions to vaccinate. None of the primary experiments which included a specific variable for intention to vaccinate found any evidence that viewing corrections improved it – though one study which measured effects on an alternative measure did.<sup>80</sup>

Without a doubt, more research is needed to investigate vaccine messaging. We need to learn more about the ways in which they affect belief in conspiracy, and intention to vaccinate over time. We also need to learn more about how different formats affect corrections, and how they may be perceived by participants from the Global South, who were under-represented in this line of research.

Until then however, there are a few things fact checkers can do – if not to immediately correct beliefs, then to hold the ground for good information.

**Don't give bad information more exposure.** Debunking anti-vaccination and other health myths is key, if this means stopping them from spreading. For instance, under Facebook's Third Party Fact Checking initiative, posts which are independently verified and deemed false by fact checkers are given less visibility across the platform, by being downranked on news feeds. This can be an effective tool against the propagation of bad information, given the power of social media to give stories exposure.<sup>81</sup> However, it is important to resist the urge of publicising such debunks further, in ways which might increase the familiarity of the myth among the general public.

**Avoid inducing fear.** Experiments which tested different correction formats found that showing participants pictures of ill patients or narratives of sickness was a counterproductive tactic, even when the illnesses represented were those prevented by, not caused by, vaccinations.<sup>82</sup> Though we do not know with certainty why this happens, fear-inducing materials have been found to backfire, generating the highest increase in the (erroneous) belief in vaccine side effects, as well as an increase in vaccine hesitancy.

**Remember that many vaccine hesitant individuals hate needles.** Avoid imagery of syringes, blood, sharp objects and other visual elements which might trigger negative

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80 Horne et al., 'Countering Antivaccination Attitudes'.

81 Bode and Vraga, 'In Related News, That Was Wrong'.

82 Pluviano, Watt, and Della Sala, 'Misinformation Lingers in Memory'.

associations with pain, fear, or disgust. After conspiratorial ideation and reactance, disgust towards needles and blood was found to be the third best predictor of vaccine hesitancy.<sup>83</sup>

**Emphasise ‘high safety’, instead of ‘low risk’.** Research reviewed by the WHO indicates that different framings of the same fact can lead to very different risk perceptions and behaviours.<sup>84</sup> Focusing on the positive effects of vaccination (which are evidenced by an overwhelming amount of literature), may be more effective than focusing on the absence of negative effects. Think of the difference between saying: vaccines save 3 million lives a year, and saying: only a very small number of people develop side effects.

**Your target is the general public, not vocal vaccine deniers.** The WHO draws a distinction between vocal vaccine deniers and vaccine refusers, who have a near zero and, respectively, low chance of acceptance, and individuals who are simply hesitant, or unsure of how vaccines work. Similarly, some of the primary research we consulted here finds that people who are already very sceptical about vaccines could be even less likely to accept the evidence after seeing a correction – although this is disputed.<sup>85</sup> Preventing vaccine conspiracies from reaching wider audiences by stopping misleading posts from being shared, is a better use of time than posting on anti-vaccination groups run by deniers.

## Tackling everyday myths

Tailor messages to target audiences. For any intervention to be effective, it first needs to reach its audience. The large-scale review we consulted makes it clear that targeting messages to specific audiences was more effective than general campaigns.

**Persist.** Changing routine behaviours takes time, and happens in stages.<sup>86</sup> In the short term, it is important to tailor messages to the stage audiences are at, to ensure that they mark the beginning of a conversation, and don’t alienate recipients with impossible demands. Following this, evidence from large-scale analyses suggests that actual behavioural change takes sustained, long-term campaigns.<sup>87</sup>

**Remember that truth needs trust.** Years of anthropological research have gone into defining trust - the social glue that keeps communities together, drawing the boundary between people we recognise as “us”, and those we keep our distance from, “them”.

83 Matthew J. Hornsey, Emily A. Harris, and Kelly S. Fielding, ‘The Psychological Roots of Anti-Vaccination Attitudes: A 24-Nation Investigation.’, *Health Psychology* 37, no. 4 (2018): 307.

84 WHO, ‘How to Respond to Vocal Vaccine Deniers in Public Health.’

85 Nyhan et al., ‘Effective Messages in Vaccine Promotion’.

86 Nat Gyenes and Megan Marrelli, ‘Health Equity through Health Fact-Checking: A Primer’ (Meedan Digital Health Lab, 2019), [health.meedan.com/primer.pdf](https://health.meedan.com/primer.pdf).

87 Stead et al., ‘Mass Media to Communicate Public Health Messages in Six Health Topic Areas’.

Choose messengers, sources, and platforms that audiences can relate to. Think locally, taking into account the customs, histories, and stakeholders who are best placed to spread your message. Overall, remember that even the best formulated message needs trust to come into effect.

**Cultivate the public's ability to think slow.** We can all take a little longer to think about the information we come across, and rein in our tendency to believe. In an earlier briefing we explored this point with reference to the literature which advocates slow, analytical thinking.<sup>88</sup> This is also something that research suggests social media platforms can train us to do. A number of studies have found that short warnings could make participants more resilient to misinformation.<sup>89</sup> As discussed previously, an experiment where 850 US adults were shown a set of 15 true and 15 false Covid-19 claims, found that asking participants to consider the accuracy of an unrelated statement before choosing what to share, made their sharing intention significantly higher for true statements than for false ones.<sup>90</sup> Naturally, we don't know how effective this subtle nudge would be in changing the minds of conspiracy supporters, or correcting beliefs in other claims which are deeply intertwined with readers' sense of identity. However, it is worth exploring as a means of encouraging users to be more careful with what they consider sharing.

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88 Vicol, 'Who Believes and Shares Misinformation?'

89 Ullrich KH Ecker, Stephan Lewandowsky, and David TW Tang, 'Explicit Warnings Reduce but Do Not Eliminate the Continued Influence of Misinformation', *Memory & Cognition* 38, no. 8 (2010): 1087–1100; Gordon Pennycook and David G. Rand, 'The Implied Truth Effect: Attaching Warnings to a Subset of Fake News Stories Increases Perceived Accuracy of Stories without Warnings', 2017.

90 Gordon Pennycook et al., 'Fighting COVID-19 Misinformation on Social Media: Experimental Evidence for a Scalable Accuracy Nudge Intervention', 17 March 2020, [doi.org/10.31234/osf.io/uhbk9](https://doi.org/10.31234/osf.io/uhbk9). 17 March 2020.



## How we selected the studies

This briefing is informed by two strands of literature: peer-reviewed academic research (or awaiting peer review), and reports produced by health organisations such as the WHO, the Centers for Disease Control and Prevention, and the Wellcome Trust.

The first part of the briefing draws on studies from the field of psychology and communication, which examined belief in, and the sharing of, misinformation in general.

In part two, we turn to papers from area studies, anthropology and health communication, which examined the rise of specific cases of misinformation in Africa, Latin America, and the UK from a qualitative, historically situated perspective.

For the interventions section, the briefing draws on the following. In the case of the anti-vaccination, we looked at: two papers which tested belief in a fictitious disease, one paper and an attempt to replicate it, which investigated the belief that the influenza jab can give the flu, rather than prevent it, another four experiments which investigated the common belief around the MMR vaccine/ autism link, as well as a systematic review of face-to-face interventions. In the case of everyday health behaviours, we draw on three case studies from Latin America and Africa, as well as a systematic review of mass media interventions in health conducted by the Institute for Health Research. Summarising the conclusions of this “review of reviews” enables us to engage with a huge area of inquiry which would have exceeded our resources for primary review, in a way which, we hope, gives fact checkers a sense of the possibilities, and limitations, of mass media campaigns.

The final section on recommendations is a synthesis of the studies reviewed here, and in our previous briefings, as well as of recommendations made by health organisations, namely the WHO, and CDC.

### Caveats

It is important to note that health misinformation is a vast area of research. This briefing is intended as an introduction into, and not an exhaustive review, of possible impacts and interventions. The distinction we draw between crises, conspiracies, and everyday misinformation is our means of drawing attention to the different strands of health misinformation fact checkers have to tackle every day. It is not a definitive classification of health misinformation, and it is important to remember that they often intersect.

There is also much more the briefing can do to nuance recommendations for different audiences, particularly across the Global South. A mixture of the unavailability of research, and our own abilities to access it, leaves considerably room for nuancing country-level recommendations.

Finally, misinformation research is constantly being refined. Several of the studies we cited in the anti-vaccination sections are conducted on student samples which are not representative of the general population. There is also a lot of variance in the designs and disciplinary traditions adopted across different studies, and in the resources authors have placed in testing the reliability of their metrics. Further research is needed to test the robustness of these findings, and above all, to supplement findings from artificial experiments with field research.

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