Trust, Science, and the Digital War on Public Health Information

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Riley Tomek
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Advisor
S. Travis Elliott, Department of Engineering and Society

Common and scientific knowledge is upheld by publications, journal proceedings, and research which dictate lifestyles, formulate ways of thinking, and advance the greater world of academia. Delving into medical research, the process of knowledge production is shaped by evolving methodologies, clinical trials, and systemic biases, enabling an ever-changing domain of expertise. In the age of rapidly emerging digital information, medical research does not exist in isolation; it is increasingly mediated by digital platforms that both amplify and distort scientific findings. The Sociology of Scientific Knowledge (SSK) framework provides a lens to examine how social, institutional, and technological factors influence the construction, validation, and dissemination of medical knowledge via digital products. Through the perspective of SSK theory, the context in which health-related information spreads is a crucial factor in shaping collective knowledge (Shapin, 1995). This paper explores how sociotechnical dynamics within digital platforms influence the construction of medical knowledge and evaluates their consequences for health equity, particularly among women. It explores how engagement-driven platforms amplify cases of health misinformation and proposes solutions for ethical digital governance in health communication. Ultimately, reshaping the online health information ecosystem may promote more equitable, trustworthy, and accessible medical knowledge. The purpose of this paper revolves around empowering individuals to make informed health decisions and fostering a more resilient, digital public sphere.

SSK Theory & Context

SSK theory proposes that despite institutional efforts to communicate accurate health information, what becomes accepted as “common knowledge” is shaped by historical, cultural, and societal contexts. A central feature of SSK, the symmetry principle, argues that both true and false beliefs should be analyzed using the same sociological tools (Shapin, 1995). In the context of health communication, this means shifting attention away from verifying accuracy and toward understanding why certain claims resonate socially. Factors such as trust in institutions, shared community narratives, media framing, and emotional appeal influence whether a claim is accepted. The spread and credibility of health information depend less on objective evidence and more on the social processes that shape its interpretation.

In historical context, this phenomenon is not new. Health institutions have struggled to maintain authority in the face of competing narratives. For example, the 1980s AIDS/HIV crisis spurred a public distrust in government responses, compounded by stigma and eventually affecting usage of health services across demographics (Padamsee, 2020). Similarly, the tobacco industry actively shaped scientific discourse for decades, ultimately delaying regulatory action (Saloojee & Dagli, 2000). These cases illustrate that scientific “truth” does not propagate in a vacuum, but is actively influenced by political and corporate agendas, media narratives, and the socio-historical context in which information is received. In the digital era, dynamics have only intensified. Public health information now emerges from a fragmented ecosystem that includes digital platforms, interpersonal community networks, academic publications, and professional healthcare providers (Malikhao, 2020). In all four of these domains, standards of practice for maintaining knowledge integrity vary extensively. Although institutions such as the Center for Disease Control and Prevention, the World Health Organization, National Institute of Health, attempt to translate scientific findings to actionable public guidance, their messages may compete with readily accessible digital content. As a result, understanding the rise of health misinformation requires more than quantifying its spread or behavioral impact from readily available social media data (Southwell et al., 2022). It demands attention to the sociotechnical systems that produce, circulate, and socially validate such claims.

The Facebook Echo Chamber

Potentially one of the most dramatic effects of SSK theory undermining health knowledge involves the circulation of Andrew Wakefield's discredited study linking the MMR vaccine to autism. In 1998, a team led by Andrew Wakefield released a case study in *The Lancet* claiming that the MMR vaccine could be associated with developmental regression and autism-related behaviors in children. His contribution spurred a new public consensus, driving the anti-vaccine movement to an all-time high and immunization rates to a new low (Omer, 2020). Leading public health organizations have rebuked his claim repeatedly, Andrew Wakefield's infamous 1998 study was retracted, and over 20 studies and reviews indicate otherwise. Still, the belief still holds true after twenty years of dialogue (Plotkin et al., 2009). The link between vaccines and autism remains a hot conversation topic on digital media platforms such as Facebook, along with many other online forums which perpetuate the misleading claim (Tustin et al., 2018). The representation of scientific knowledge on digital platforms, specifically Facebook, can prove to be unreliable in many contexts, particularly in conversations which involve personal autonomy in critical health decisions. SSK theory suggests that the acceptance of the vaccine-autism link cannot be dismissed solely as misinformation but must be understood as a socially embedded phenomenon.

Facebook alone hosts over 3 billion monthly active users susceptible to engaging in medical conversation (*Meta Reports Fourth Quarter and Full Year 2024 Results*, 2024). Similar, global digital platforms have not only amplified false claims but have also solidified them into persistent public beliefs, despite overwhelming scientific evidence to the contrary. Examples of health information playing out have promoted abundant fallacies, particularly, in the understanding of vaccination and infectious diseases (Wang et al., 2019). In an analysis of a typical vaccine discussion on Facebook, 20.8% of comments revealed entirely inaccurate knowledge on immunization (Tustin et al., 2018). The arbitrary nature of social media platforms as decentralized information ecosystems enables unchecked narratives to proliferate, often prioritizing personal narratives over factual accuracy. As it stands, digital media plays a growing role in spreading health-related information, shaping treatments, vaccinations, and lifestyle habits (Kanchan, 2023). When digital discourse challenges or outright refutes established medical consensus, SSK theory suggests that the responsibility for response shifts beyond scientific rebuttal. It lies in the hands of public health institutions, communication strategists, and digital platforms to engage with these socially persistent belief systems empathetically and structurally.

In other instances, digital communities have fostered dialogue, provided support, and promoted education. For example, one condition which benefits from publicly available narratives and forums is endometriosis. This chronic disease impacting 1 in 10 women worldwide, characterized by severe pain and often undiagnosed, is currently lacking a definitive cure (*Endometriosis*, n.d.). In this example of a widely unknown condition, media platforms provide an excellent opportunity for patients to access valuable resources via open-ended discussion. Retrospective analysis of posts across Facebook pages indicates that central themes of this form of media provide 1) emotional support and 2) educational content (Towne et al., 2021). This phenomenon suggests that emotional narratives drive most engagement, particularly among anxiety-prone user groups, differentiating those suffering from long-term illnesses from other social media communities. While digital media provides a crucial platform for overlooked conditions like endometriosis, it simultaneously reinforces a fundamental issue of engagement-driven health misinformation. The dominance of emotionally resonant content, where posts categorized as ‘emotional’ drive up to 70% of engagement, reveals a structural flaw: emotional topics win over trustworthy science in the online medical community (Towne et al., 2021). This phenomenon is not unique to endometriosis but reflects a broader trend in digital health discourse, where anecdotal experiences often overshadow scientifically validated information (McMullan et al., 2019).

SSK theory’s symmetry principle is especially relevant in understanding the persistence of both true and false beliefs within similar public and digital discourse, whether sourced from medical error or the impact of chronic illness. By applying this principle, both scientifically accurate knowledge and misinformation should be examined under the same sociological lens. This challenges the common tendency to simply dismiss vaccine misinformation or anecdotes as falsehoods without exploring the broader societal dynamics that facilitate their spread and perpetuate risks to public health. Unlike vaccine misinformation, which actively undermines public health initiatives, the unchecked nature of community-driven medical discourse in chronic illness spaces fosters a different risk. It encourages the normalization of unverified treatments, self-diagnoses, and alternative medicine narratives that may delay proper care. Interpretive flexibility is a natural part of understanding a patient’s experience, but without proper moderation, it can undermine legitimate medical dialogue. The decentralization of health communication on social media blurs the line between patient empowerment and medical misinformation (Arena et al., 2022). The very platforms that offer support to those ignored by traditional healthcare also create an ecosystem where misinformation can flourish unchecked, shaping treatment perceptions. This raises a critical question: How can digital platforms support patient advocacy, especially within vulnerable populations, without undermining the integrity of medical knowledge? And who holds the responsibility for ensuring that accurate, evidence-based information is shared?

Twitter and Coronavirus

Perhaps one of the most influential cases of rapidly spreading online health information occurred in 2020 at the beginning stages of the COVID-19 pandemic, which spurred extensive vulnerabilities of specific health populations. At a baseline, at least in the United States, 9 in 10 Americans struggle with health literacy (*Health Literacy Fact Sheets*, n.d.). Therefore, exemplifying the most effective strategies for health communication in a global pandemic requiring large-scale behavioral change was critical. Early risk communication from public officials pushed the narrative that everything was “under control.” In contrast, leading institutions and technical experts became undermined by prominent misinformation campaigns and skepticism toward scientific guidance (Malecki et al., 2020). As the crisis unfolded, conflicting messages about the severity of the virus, mask effectiveness, and vaccine safety led to public confusion and widespread distrust. Combating this, the World Health Organization utilized Twitter (now X) discourse to promote public engagement and successfully encouraged responsible behaviors and science-based messages (Muñoz-Sastre et al., 2021). However, despite having a prominent level of engagement, an unexpected development occurred. A group of influencers emerged as the ‘Twitter elite,’ overshadowing public health organizations dramatically. Ironically enough, the individuals who contributed to the most reach and resonance for COVID-19 guidelines on Twitter during this timeframe were celebrities. With infrequent messages, often promoting some product, service, or personal agenda, influencers and celebrities overwhelmingly cascaded this media platform. Mainstream media outlets like CNN, BBC, and Reuters had significantly less influence and reach compared to prominent figures such as politicians like Donald Trump and Barack Obama, pop stars like Harry Styles and Taylor Swift, and business leaders like Elon Musk (Jaworska et al., 2024). In hindsight, there was established potential for a platform to encourage top-down health communication on social platforms like Twitter, where public discourse on scientific guidelines is allotted alongside current medical findings. However, major public health guidelines and reach were left in the hands of individuals with no medical authority nor expertise. Whether the users of Twitter actually adhered to the guidance is left under question, but the sheer volume of interactions suggests that these figures played a critical role in shaping public discourse around COVID-19.

In the aftermath, the disparities in access to reliable health information were significantly exacerbated, revealing deep-seated communication inequalities linked with health disparities. The lack of authoritative voices in digital health discourse disproportionately affected vulnerable populations, particularly those with lower education, lower income, and marginalized identities. Studies analyzing these highlight that individuals with lower education levels were particularly vulnerable to misinformation (Häfliger et al., 2023). Seven studies have linked misinformation and lack of trust in public health messaging to increased infection rates, particularly among Latinx communities in the U.S., where participants cited social media as a major source of misinformation leading to hospitalization. In addition, pregnant women with lower education had significantly lower knowledge and applied fewer preventive measures compared to other participants (Häfliger et al., 2023). Complementing this, women already possess inadequate health literacy regarding the prenatal period, a critical time frame that determines reproductive outcomes. These outcomes are significantly exacerbated by age, ethnicity, and socioeconomic background (Meldgaard et al., 2022). Misled diagnoses from online resources and digital influencers force women to seek treatment elsewhere, setting up opportunities for alternative providers to attempt to solve the problems exacerbated by the coronavirus that could have been addressed by primary healthcare providers.

How might have Twitter's algorithmic biases deepened existing gendered disparities in health knowledge access? Specifically, women with lower education and financial insecurity were more likely to engage with emotionally charged misinformation rather than verified public health messages, aligning with SSK theory's argument that knowledge is socially constructed and shaped by power dynamics. Women, especially those ethnic minority and low-education groups, pose a distinct risk to misinformation on Twitter due to economic constraints. Algorithmic systems can limit certain demographics from accessing credible digital health information and institutional guidance. Ideally, informed decision-making should be shaped by diverse sources, ensuring that no single platform, actor, or institution dominates the process. However, SSK theory reveals how power and social dynamics streamline what is accepted as health knowledge. Just as Facebook's emotionally-driven engagement reinforces persistent medical myths like the vaccine-autism link, Twitter's algorithmic elevation of celebrity voices over scientific ones during the COVID-19 pandemic reveals a parallel failure. In both cases, digital visibility and social capital, not scientific validity, dictates the public's health knowledge. These platforms shape, legitimize, and sustain socially constructed beliefs in ways SSK theory critically exposes.

Influencing Health on Instagram

Under Meta's umbrella, Instagram stands as a leading digital platform, particularly among adolescents, with 6 in 10 teens actively using the app (Massarat, 2022). Unlike Facebook and Twitter, which emphasize text-based interaction, Instagram is centered around short-form videos and photo sharing, making visual content the primary mode of communication. This visual-first approach creates a distinct avenue for information dissemination, shaping how messages are framed, perceived, and engaged with. Instagram conveniently includes a ‘health’ category on its platforms, yet 90% of accounts labeled under this category fail to publish health-related content. Instead, these accounts primarily attract followers aged 25 to 34, and beauty-related messaging dominates (Picazo-Sánchez et al., 2022). While these accounts often present a lifestyle associated with health, their content rarely aligns with genuine health promotion. Although clearly distinct from direct public health guidelines and urgent pandemic-related information, Instagram's credibility comes into question as it shapes how younger generations perceive and approach personal health. Key features of Instagram health content highlight the normative body and raise concerns about the impact on eating disorders, sexual and reproductive health, and lifestyle habits. In a similar fashion to the rise of Twitter COVID-19 influencers, Instagram's algorithmic structure prioritizes engagement-driven content, amplifying posts that evoke strong emotional reactions, whether through aspirational imagery or personal narratives. The study by Picazo-Sánchez highlights that 44.5% of female health influencers’ content revolves around beauty, normative bodies, or eroticism, compared to only 17.9% among male influencers. This discrepancy underscores a fundamental issue: while male influencers categorized under "health" are more likely to promote fitness or wellness advice, female influencers are far more likely to frame health through the lens of appearance. A similar pattern emerged on another visual content platform, YouTube, particularly in examining the favoring of pro-anorexia videos versus informative content (Syed-Abdul et al., 2013). These platforms’ visual-first nature reinforces the prioritization of appearance-based health narratives, exacerbating the normalization of body image standards that may contribute to disordered eating, unverified hormonal health trends, and the glamorization of restrictive diets.

Other trends emerging on Instagram specifically involve media influencers frequently promoting medical screening tests. Some of these tests encourage food sensitivity, hormone, or vitamin panels without disclosing potential risks, clinical context, or medical necessity (Nickel et al., 2025). Many of these posts contain incomplete or misleading health claims, often encouraging viewers to pursue testing without guidance from licensed professionals. This shift in digital health discourse reflects not only a knowledge gap but also the financial incentives driving content creation. Influencers often receive affiliate commissions or direct payments from wellness brands and diagnostic companies, turning personal health narratives into monetized promotions. As a result, health becomes commodified, and audiences, particularly young women, are subtly steered toward consumer decisions that may offer little clinical value. Through the perspective of SSK theory, these trends demonstrate how economic and social power structures shape what is accepted as legitimate health knowledge online. In light of Facebook's misinformation loops and Twitter's celebrity-driven COVID narratives, Instagram's wellness economy turns influencer authority into a market-driven force.

The State of Women's Health Research

The widespread influence of digital platforms on health narratives not only distorts medical accuracy but also reflects deeper structural gaps in healthcare research. While misinformation proliferates through social media, it does so within an already flawed system. Scientific research has historically neglected key areas of women's health. This preexisting disparity in medical knowledge amplifies the consequences of digital misinformation, as gaps in research leave women particularly vulnerable to misleading health narratives. For example, leading health risks in the United States, such as cardiovascular disease, have continually manifested uniquely in women and have not been investigated thoroughly. The presence of risk factors for heart disease, autoimmune disorders, diabetes, and reproductive issues are misunderstood and dictate the outcomes of diagnosis and personal care experience. Primary care physicians are more focused with diagnosing health issues related to weight concerns and breast cancer in women as opposed to heart disease, which stands as the leading cause of death for women (Bairey Merz et al., 2017). Enabling healthcare providers, patients, and the public with reliable information in an ever-growing digital age is critical when such disparities exist between concerns versus respective treatments. More specifically, there have existed consistent barriers to providing quality and reliable research in women’s health regarding the menstrual cycle, prenatal period, and value of nutrition. Up until the early 90’s, women were not required to be considered in clinical trials unless a distinct reasoning for exclusion was provided (Mastroianni et al., 1999). A conducted study of a disease that affects both men and women may have selected only male participants to control for the anomalies detected during hormonal fluctuations or pregnancy (Shieh & Halstead, 2009). This lack of comprehensive research and historical exclusion from clinical trials has contributed to persistent gaps in understanding and treating conditions that uniquely or disproportionately affect women. As discussed earlier, alternative health narratives often fill the void left by inadequate medical research.

Consumers and Care

On a broader scale, the pharmaceutical industry plays a significant role in shaping the accuracy and accessibility of medical information presented to the public. As suggested by SSK theory, the hold of economic power in question comes into play. In alignment with the pattern found on Instagram and similar media platforms, historical context surrounding women’s health also points to consumer concerns, beauty, and convenience rather than enhancing overall health and well-being. Specifically, the development in marketing tactics of oral contraception has come under fire for being sold as a lifestyle drug rather than a strategic public health tool. Companies emphasize secondary benefits like menstrual suppression, acne control, and mood regulation over their primary function of pregnancy prevention. This is a shift that has placed oral birth control alongside medications for erectile dysfunction, smoking cessation, and weight loss, with economic implications such as exclusion from certain insurance coverage lists (Watkins, 2012). There has been a lack of significant research and development for “the pill” since the 1960’s, yet a distinct shift in the way consumers behave. Physicians report a surge in birth-control misinformation online affecting their practice, particularly targeting teens and young adults who are highly influenced by algorithm-driven content. While doctors affirm that hormonal contraception is safe and effective, they acknowledge that the medical field’s historical lack of transparency about rare but serious side effects has driven many patients to seek information from unqualified online sources (Weber & Malhi, 2024).

Compare this development to the current boom in GLP-1 drugs, originally developed to address Type 2 diabetes. Just as birth control pills were repositioned as lifestyle drugs emphasizing menstrual suppression and acne control rather than reproductive health, GLP-1 receptor agonists have transitioned from a diabetes treatment to a widely sought-after weight-loss solution and now facing immense supply shortages (Mattingly & Conti, 2025). As an aid to weight loss, concerns arise as compounding pharmacies and online distributors capitalize on demand through aggressive marketing tactics, often using "patient influencers" to promote weight-loss programs. These advertisements frequently emphasize cost savings over branded GLP-1 receptor agonists, but may lack adequate disclosure of potential risks (Mattingly & Conti, 2025). The rise of patient influencers, as examined in X and Instagram, exemplifies this phenomenon (Willis & Delbaere, 2022). Unlike traditional pharmaceutical marketing, these influencer-driven endorsements create an illusion of authenticity while bypassing regulatory oversight.

This intersection of financial incentives, algorithmic visibility, and identity-driven messaging underscores a core argument of this paper. Digital health knowledge, particularly in women’s health, is shaped less by scientific accuracy and more by systems of profit, platform dynamics, and perceived credibility. SSK theory challenges patients to understand these narratives not as anomalies, but as outcomes of broader social structures where economic power, technological design, and institutional authority collide.

Who Controls the Narrative?

In discussion around the status of medical research baseline, the emerging role of digital platforms and the necessity of ethical oversights comes under question. Can we ensure checks and balances in the dissemination of health-related information and development of products? While digital platforms, pharmaceutical companies, and public health institutions all play critical roles in shaping medical knowledge, their competing interests often lead to ethical gray areas. The evolving role of digital platforms, existing healthcare research, and pharmaceutical marketing presents a complex landscape where the balance between innovation, accessibility, and accuracy is constantly shifting. For example, Meta, the parent company to Facebook and Instagram, ushered a recent decision to phase out its fact-checking program in the United States, raising concerns about how medical information will be moderated moving forward (Jingnan, 2025). The company’s move to a crowdsourced "Community Notes" model reflects broader debates over who should be responsible for verifying information online and how these decisions impact public health. Similarly, on Twitter, the reappearance of both ambiguous and false information underscores the platform's evolving role in shaping public discourse. One study analyzing two million tweets from 123 fact-checked stories found that ambiguity, rather than outright falsehood, plays a dominant role in the reappearance of health-related misinformation. This research supports the idea that unclear, open-ended, or contextually vague statements are more likely to resurface, even with product interventions in place (Kauk et al., 2025). Most fact-checking initiatives focus on binary truth versus falsehood assessments, but this study suggests that vague or misleading claims that lack context require different moderation strategies. Digital platforms, therefore, must reconsider whether removing false information is enough, or if they must also address how ambiguity is framed and amplified in online discussions. From an SSK perspective, digital platforms, such as those under the Meta umbrella and Twitter, do not merely transmit information. These applications serve as arenas where authority, trust, and expertise are continuously redefined. Especially considering financial incentives behind controlling one health narrative over another, community-based discourse may not cover enough ground.

Another key challenge in moderating medical misinformation online is the delicate balance between preserving free speech and ensuring the integrity of health-related discourse. While platforms like Facebook, Instagram, and Twitter have attempted to implement content moderation policies, these interventions often fall short due to their reactive nature. Instead of proactively curating credible health content, platforms tend to intervene only after misinformation has gone viral, by which point it has already influenced public perception. The removal of fact-checking programs, such as Meta’s decision to phase out its initiative in the U.S., highlights an ongoing shift toward community-based moderation, raising concerns about the efficacy of crowdsourced verification systems in handling complex medical claims (Jingnan, 2025). This shift underscores a broader issue in digital governance: when misinformation is framed as ambiguous rather than outright false, it becomes harder to regulate through traditional fact-checking mechanisms.

The persistence of misinformation is not just a failure of content moderation but a symptom of deeper systemic issues in digital communication. The interplay of engagement-driven algorithms, the commercialization of health information, and longstanding gaps in medical research, especially in women's health, creates an environment where misinformation thrives. Public trust in traditional medical institutions is further eroded when scientific knowledge is seen as inconsistent or driven by corporate interests, fueling reliance on anecdotal evidence and influencer-driven health narratives. The SSK framework also raises critical questions about the role of digital platforms in shaping public understanding of science. Addressing these challenges requires a multifaceted approach that includes better transparency in algorithmic content curation, a dynamic institutional and user presence on digital platforms, and proactive efforts to improve health literacy across diverse populations. Without these interventions, the digital landscape will continue to function as both a vehicle for medical misinformation and an amplifier of systemic inequities in health knowledge access.

Conclusion

Addressing health misinformation in digital spaces requires tackling more than just falsehoods. It demands a fundamental shift in how medical knowledge is produced, interpreted, and legitimized across digital platforms. Through the angle of the Sociology of Scientific Knowledge (SSK), it becomes clear that public acceptance of health information is not solely driven by scientific accuracy but by visibility, social trust, and emotional resonance. Facebook, Twitter (X), and Instagram each contribute uniquely to this challenge. Facebook’s echo chambers reinforce misinformation in medical communities, Twitter’s virality amplifies emotionally resonant but misleading health claims, and Instagram’s visual-first nature and consumer tactics prioritize aspirational health narratives over scientific accuracy. These dynamics are further compounded by pharmaceutical marketing tactics, which often blur the line between medical necessity and lifestyle enhancement, as seen in the rebranding of GLP-1 drugs and hormonal birth control for off-label or cosmetic use. The rise of patient influencers in these spaces adds another layer of ambiguity, as peer-driven endorsements often lack the regulatory scrutiny applied to traditional pharmaceutical advertising, leading to misleading representations of risks and benefits.

To counteract this, digital platforms must integrate targeted moderation strategies, algorithmic adjustments, and user-centric transparency features. Fact-checking systems should move beyond binary classifications and introduce nuanced verification scales that flag contextually misleading content, not just outright falsehoods. Platforms may develop interactive disclosure labels, linking health-related posts to verified medical sources, and implement hybrid moderation models that assess misleading framing, selective omissions, and emotionally charged narratives in medical content. Similarly, a truly user-centric solution may begin with individuals reclaiming agency in digital health spaces. Rather than depending on platforms or institutions to moderate content, users can collectively shape the standards of credible health discourse through community-vetted resource lists, peer-led mentorship channels, and informed resistance to manipulation. In this way, the user is not merely a passive recipient of information, but an active producer, curator, and critic. Meanwhile, public health institutions must assert their role in public dialogue and strengthen digital engagement. Confronting digital health misinformation requires not just better tools, but a reimagining of who holds authority, how knowledge is constructed, and whose voices are allowed to shape the terms of public health discourse. In the end, shaping public health discourse online exists as a social responsibility, not just a technical challenge. Whether through regulation, user action, or institutional leadership, the path forward depends on who we trust to define health, and whose stories we choose to believe.

References

Arena, A., Esposti, E. D., Orsini, B., Verrelli, L., Rodondi, G., Lenzi, J., Casadio, P., & Seracchioli, R. (2022). The social media effect: The impact of fake news on women affected by endometriosis. A prospective observational study. *European Journal of Obstetrics and Gynecology and Reproductive Biology*, *274*, 101–105. https://doi.org/10.1016/j.ejogrb.2022.05.020

Bairey Merz, C. N., Andersen, H., Sprague, E., Burns, A., Keida, M., Walsh, M. N., Greenberger, P., Campbell, S., Pollin, I., McCullough, C., Brown, N., Jenkins, M., Redberg, R., Johnson, P., & Robinson, B. (2017). Knowledge, Attitudes, and Beliefs Regarding Cardiovascular Disease in Women: The Women's Heart Alliance. *Journal of the American College of Cardiology*, *70*(2), 123–132. https://doi.org/10.1016/j.jacc.2017.05.024

Endometriosis. (n.d.). Retrieved May 7, 2025, from https://www.who.int/news-room/fact-sheets/detail/endometriosis

Häfliger, C., Diviani, N., & Rubinelli, S. (2023). Communication inequalities and health disparities among vulnerable groups during the COVID-19 pandemic—A scoping review of qualitative and quantitative evidence. *BMC Public Health*, *23*(1), 428. https://doi.org/10.1186/s12889-023-15295-6

Health Literacy Fact Sheets. (n.d.). Center for Health Care Strategies. Retrieved May 7, 2025, from https://www.chcs.org/resource/health-literacy-fact-sheets/

Jaworska, S., Goodman, M. K., & Gibas, I. (2024). The Making of #CovidTwitter: Who Were the Loudest “Covid Influencers” and What Did They Say About the COVID-19 Pandemic? *Social Media + Society*, *10*(1), 20563051231222240. https://doi.org/10.1177/20563051231222240

Jingnan, H. (2025, January 10). Meta built a global fact-checking operation. Will it survive? *NPR*. https://www.npr.org/2025/01/10/nx-s1-5252738/meta-fact-checking-international

Kanchan, S. (2023). *Social Media Role and Its Impact on Public Health: A Narrative Review | Cureus*. https://www.cureus.com/articles/115786-social-media-role-and-its-impact-on-public-health-a-narrative-review#!/

Kauk, J., Kreysa, H., & Schweinberger, S. R. (2025). Large-scale analysis of fact-checked stories on Twitter reveals graded effects of ambiguity and falsehood on information reappearance. *PNAS Nexus*, *4*(2), pgaf028. https://doi.org/10.1093/pnasnexus/pgaf028

Malecki, K. M. C., Keating, J. A., & Safdar, N. (2020). Crisis Communication and Public Perception of COVID-19 Risk in the Era of Social Media. *Clinical Infectious Diseases*, *72*(4), 697–702. https://doi.org/10.1093/cid/ciaa758

Malikhao, P. (2020). Health Communication: Approaches, Strategies, and Ways to Sustainability on Health or Health for All. In J. Servaes (Ed.), *Handbook of Communication for Development and Social Change* (pp. 1015–1037). Springer. https://doi.org/10.1007/978-981-15-2014-3_137

Massarat, E. A. V., Risa Gelles-Watnick and Navid. (2022, August 10). Teens, Social Media and Technology 2022. *Pew Research Center*. https://www.pewresearch.org/internet/2022/08/10/teens-social-media-and-technology-2022/

Mastroianni, A. C., Faden, R., Federman, D., & Studies, I. of M. (US) C. on the E. and L. I. R. to the I. of W. in C. (1999). Justice and the Inclusion of Women in Clinical Studies: A Conceptual Framework. In *Women and Health Research: Ethical and Legal Issues of Including Women in Clinical Studies: Volume 2: Workshop and Commissioned Papers*. National Academies Press (US). https://www.ncbi.nlm.nih.gov/books/NBK236575/

Mattingly, I., T. Joseph, & Conti, R. M. (2025). Marketing and Safety Concerns for Compounded GLP-1 Receptor Agonists. *JAMA Health Forum*, *6*(1), e245015–e245015. https://doi.org/10.1001/jamahealthforum.2024.5015

McMullan, R. D., Berle, D., Arnáez, S., & Starcevic, V. (2019). The relationships between health anxiety, online health information seeking, and cyberchondria: Systematic review and meta-analysis. *Journal of Affective Disorders*, *245*, 270–278. https://doi.org/10.1016/j.jad.2018.11.037

Meldgaard, M., Gamborg, M., & Terkildsen Maindal, H. (2022). Health literacy levels among women in the prenatal period: A systematic review. *Sexual & Reproductive Healthcare*, *34*, 100796. https://doi.org/10.1016/j.srhc.2022.100796

Meta Reports Fourth Quarter and Full Year 2024 Results. (n.d.). Retrieved May 7, 2025, from https://investor.atmeta.com/investor-news/press-release-details/2025/Meta-Reports-Fourth-Quarter-and-Full-Year-2024-Results/default.aspx

Muñoz-Sastre, D., Rodrigo-Martín, L., & Rodrigo-Martín, I. (2021). The Role of Twitter in the WHO's Fight against the Infodemic. *International Journal of Environmental Research and Public Health*, *18*(22). https://doi.org/10.3390/ijerph182211990

Nickel, B., Moynihan, R., Gram, E. G., Copp, T., Taba, M., Shih, P., Heiss, R., Gao, M., &

Zadro, J. R. (2025). Social Media Posts About Medical Tests With Potential for Overdiagnosis. *JAMA Network Open*, *8*(2), e2461940. https://doi.org/10.1001/jamanetworkopen.2024.61940

Omer, S. B. (2020). The discredited doctor hailed by the anti-vaccine movement. *Nature*, *586*(7831), 668–669. https://doi.org/10.1038/d41586-020-02989-9

Padamsee, T. J. (2020). Fighting an Epidemic in Political Context: Thirty-Five Years of HIV/AIDS Policy Making in the United States. *Social History of Medicine*, *33*(3), 1001–1028. https://doi.org/10.1093/shm/hky108

Picazo-Sánchez, L., Domínguez-Martín, R., & García-Marín, D. (2022). Health Promotion on Instagram: Descriptive–Correlational Study and Predictive Factors of Influencers' Content. *International Journal of Environmental Research and Public Health*, *19*(23). https://doi.org/10.3390/ijerph192315817

Plotkin, S., Gerber, J. S., & Offit, P. A. (2009). Vaccines and Autism: A Tale of Shifting Hypotheses. *Clinical Infectious Diseases*, *48*(4), 456–461. https://doi.org/10.1086/596476

Saloojee, Y., & Dagli, E. (2000). Tobacco industry tactics for resisting public policy on health. *Bulletin of the World Health Organization*, *78*(7), 902–910.

Shapin, S. (1995). Here and Everywhere: Sociology of Scientific Knowledge. *Annual Review of Sociology*, *21*(Volume 21, 1995), 289–321. https://doi.org/10.1146/annurev.so.21.080195.001445

Shieh, C., & Halstead, J. A. (2009). Understanding the Impact of Health Literacy on Women's Health. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, *38*(5), 601–612. https://doi.org/10.1111/j.1552-6909.2009.01059.x

Southwell, B. G., Brennen, J. S. B., Paquin, R., Boudewyns, V., & Zeng, J. (2022). Defining and

Measuring Scientific Misinformation. *The ANNALS of the American Academy of Political and Social Science*, *700*(1), 98–111. https://doi.org/10.1177/00027162221084709

Syed-Abdul, S., Fernandez-Luque, L., Jian, W.-S., Li, Y.-C., Crain, S., Hsu, M.-H., Wang, Y.-C., Khandregzen, D., Chuluunbaatar, E., Nguyen, P. A., & Liou, D.-M. (2013). Misleading Health-Related Information Promoted Through Video-Based Social Media: Anorexia on YouTube. *Journal of Medical Internet Research*, *15*(2), e2237. https://doi.org/10.2196/jmir.2237

Towne, J., Suliman, Y., Russell, K. A., Stuparich, M. A., Nahas, S., & Behbehani, S. (2021). Health Information in the Era of Social Media: An Analysis of the Nature and Accuracy of Posts Made by Public Facebook Pages for Patients with Endometriosis. *Journal of Minimally Invasive Gynecology*, *28*(9), 1637–1642. https://doi.org/10.1016/j.jmig.2021.02.005

Tustin, J. (n.d.). *JMIR Public Health and Surveillance—User-Driven Comments on a Facebook Advertisement Recruiting Canadian Parents in a Study on Immunization: Content Analysis*. Retrieved May 7, 2025, from https://publichealth.jmir.org/2018/3/e10090/

Tustin, J. L., Crowcroft, N. S., Gesink, D., Johnson, I., Keelan, J., & Lachapelle, B. (2018). User-Driven Comments on a Facebook Advertisement Recruiting Canadian Parents in a Study on Immunization: Content Analysis. *JMIR Public Health Surveill*, *4*(3), e10090. https://doi.org/10.2196/10090

Wang, Y., McKee, M., Torbica, A., & Stuckler, D. (2019). Systematic Literature Review on the Spread of Health-related Misinformation on Social Media. *Social Science & Medicine*, *240*, 112552. https://doi.org/10.1016/j.socscimed.2019.112552

Watkins, E. S. (2012). How the Pill Became a Lifestyle Drug: The Pharmaceutical Industry and Birth Control in the United States Since 1960. *American Journal of Public Health*, *102*(8), 1462–1472. https://doi.org/10.2105/AJPH.2012.300706

Weber, L., & Malhi, S. (2024). *Women are getting off birth control amid misinformation explosion—The Washington Post*. https://www.washingtonpost.com/health/2024/03/21/stopping-birth-control-misinformation/

Willis, E., & Delbaere, M. (2022). Patient Influencers: The Next Frontier in Direct-to-Consumer Pharmaceutical Marketing. *Journal of Medical Internet Research*, *24*(3), e29422. https://doi.org/10.2196/29422