

*Annual Review of Public Health*Health Misinformation
Exposure and Health
Disparities: Observations
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Annu. Rev. Public Health 2023. 44:113–30

First published as a Review in Advance on
October 7, 2022The *Annual Review of Public Health* is online at
publhealth.annualreviews.org<https://doi.org/10.1146/annurev-publhealth-071321-031118>

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**Keywords**

misinformation, health disparity, health disparities, structural racism, misperception, health behavior

Abstract

The concepts of health misinformation and health disparities have been prominent in public health literature in recent years, in part because of the threat that each notion poses to public health. How exactly are misinformation proliferation and health disparities related, however? What roles might misinformation play in explaining the health disparities that we have documented in the United States and elsewhere? How might we mitigate the effects of misinformation exposure among people facing relatively poor health outcomes? In this review, we address such questions by first defining health disparities and misinformation as concepts and then considering how misinformation exposure might theoretically affect health decision-making and account for disparate health behavior and health outcomes. We also

assess the potential for misinformation-focused interventions to address health disparities based on available literature and call for future research to address gaps in our current evidence base.

INTRODUCTION

News headlines in recent years have highlighted misinformation as a threat to public health and well-being. Many commentators have pointed to false or misleading information about health and medical science—especially from online resources—as a force that can undermine the judgments of populations and lead to public health challenges that reflect inappropriate behavioral choices or inaction (40, 47, 54, 62, 63, 102–104). In 2021, the US Office of the Surgeon General declared health misinformation to be a direct challenge to public health (65). Many public information environments around the world are robust in terms of sheer volume yet also replete with inaccurate information about health and medicine (93). Although health and medical misinformation has been an aspect of public life for more than a century, consternation regarding such misinformation clearly has animated discourse and research in the past decade.

While research and commentary have highlighted the dilemma of health or medical misinformation as an ostensible threat to public health, evidence has also accumulated regarding the persistence of inequitable differences between demographic groups in terms of health and well-being. In the United States, for example, communities of color generally bear the greatest burden of disease morbidity and mortality relative to other groups. A 2022 Kaiser Family Foundation analysis found that Black, Hispanic, and American Indian and Alaska Native people fared worse than White people on a majority of measures such as health insurance coverage, health care access, and health outcomes, whereas reported experiences for Asian people tended to be similar to those reported for White people (44). Boulware & Mohottige (16) detailed an example in the case of kidney care. Racial minorities with modifiable risk factors for chronic kidney disease were less aware of such risks compared to nonminorities and also less likely than nonminorities to receive referrals to nephrology care or adequate predialysis care. We see similar patterns in infectious disease outcomes. The story of HIV in the twentieth and twenty-first centuries cannot be adequately told without mentioning challenges that Black patients have faced in getting accurate information (49). Patterns of health disparities and inequity as a function of race and ethnicity have been a key theme of the COVID-19 pandemic experience as well (39, 66).

Researchers have also documented disparities across the life span. Consider the experiences of people in the United States who identify as Black, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, Asian, and Latine [or Hispanic or Latino, as labeled by the US Office of Management and Budget (95)]. Racial disparities have been clear in US infant mortality patterns (97). We also see racial and ethnic disparities at the end of life. In North Carolina, for example, Black and Latine people have been underrepresented in hospice care relative to population distribution in comparison with White patients, despite hospice availability in every county in the state (8).

We face two striking patterns: a proliferation of inaccurate medical information and the persistent reality that a large number of people are enduring inequitable health outcomes. Some discourse on public health has suggested that the coincidence of these patterns is cause for concern and that misinformation exposure may be leading to or exacerbating health disparities. Tan & Bigman (94) concluded that online misinformation regarding e-cigarettes holds the potential to widen health disparities. Popular news coverage has also raised alarm about the effects of misinformation among certain demographic groups. A fall 2021 *NBC News* story highlighted Nielsen

data documenting a greater tendency of Latine individuals in the United States to access misinformation (1). To what extent are concerns about misinformation proliferation and health disparities related, however? What roles might misinformation play in explaining the health disparities that we have increasingly documented in the United States and elsewhere?

To address questions about the relationship between health-related misinformation and health disparities, we need to define health disparities and health or medical misinformation as concepts, consider how misinformation exposure might theoretically affect health decision-making, consider possibilities for misinformation to account for disparate health behavior and health outcomes, and assess the potential for misinformation-focused interventions to address health disparities. What follows is an exploration of each task as well as a call for future research to address gaps in our current evidence base.

DEFINITIONS

Health Disparities

Following the work of scholars such as Braveman (18, 19) and Diez Roux (33), we can start our discussion by acknowledging that historically disadvantaged social groups systematically experience worse health outcomes than do more advantaged social groups. Diez Roux (33) defined disparities as plausibly avoidable health differences that affect people in positions of social disadvantage. Such a focus moves beyond the fact of any within-group differences to consider factors that perpetuate differences that are potentially avoidable, unnecessary, or unjust.

In relating disparities in health outcomes to elements of a communication system, we should pay attention to historical circumstances that can account for what otherwise might appear to be individual preferences for information (85). Literature on public health and medicine has often overlooked institutional racism in explaining observed differences, for example (101). Many of the differences in the health outcomes of various groups reflect structural and systemic patterns of racism and discrimination based on race, gender, social standing, and economics that have existed and persisted over time (42, 55). Furthermore, if we consider racial identity as an ideological position forged at least in part from historical social circumstance, as Davis & Gandy (30) suggested, then we need to look at the structural determinants of communication patterns in proposing remedies for cross-sectional patterns of concern such as individual exposure to health or medical misinformation and individual health behavior.

Health or Medical Misinformation

Academic literature on misinformation to date has lacked explicit consensus on what the term entails; this is evident in research on misinformation directly related to health or medicine as well. Recent work to address that cacophony in the case of scientific misinformation is helpful to our present review. In defining the broad notion of scientific misinformation, Southwell and colleagues (87) focused on publicly available information that is inaccurate or misleading relative to the best scientific evidence available; they also emphasized content that directly counters statements by actors or institutions who adhere to scientific principles. What is notable about that approach is the dual emphasis on inaccuracy relative to the best available evidence—an element that can lead to problematic decisions—and on relationships between audiences and scientific institutions. The idea that scientific misinformation can signal miscommunication or mistrust between scientific institutions and people working outside of those institutions will be important for our assessment of how misinformation and health disparities are related. Insofar as public health researchers and practitioners are concerned with claims at odds with peer-reviewed literature, we can extend this approach to define health or medical misinformation in a similar way: information at odds with

the best available evidence from health-related research at the time. For our present discussion, we focus primarily on misinformation exposure among patients or consumers, although professionals and patients can both encounter misinformation.

As for potential distinctions between health misinformation and medical misinformation, we acknowledge that some researchers may distinguish between public health information, e.g., preventive or community-level considerations, and medical information related to treatment and care. We also recognize, however, that patients or consumers can draw on both types of information (and misinformation) when making judgments about health and well-being, and so we consider health misinformation and medical misinformation as relevant to this review.

Additional Concepts

Beyond a general definition of scientific misinformation related to health and medicine, we also should consider various dimensions of inaccuracy that are possible. Some health claims stand in logical conflict with available scientific evidence. A claim for the value of lemon juice as a protectant against COVID-19, for example, is not rooted in peer-reviewed evidence on infectious disease (69). Such a claim might stem from individual imagination or might even resonate with long-standing cultural beliefs or themes but nonetheless runs counter to the preponderance of available scientific evidence. Classification of the claim as misinformation involves consideration of the logic of what is being explicitly stated. Other aspects of content can also be misleading beyond explicit words, however. For instance, visual elements beyond text can be deceptive (52). Material can also appear in formats that inappropriately imply sources of data or that suggest endorsement by various platforms. In the case of misinformation that appears on social media platforms, the source and lineage of information and misinformation can be unclear.

The multidimensional nature of possibilities for inaccuracy, deception, and confusion in the case of health or medical misinformation suggests that susceptibility to misinformation also reflects an array of information processing skills and preexisting experiences. Health or medical misinformation processing likely involves health information interpretation skills that scholars have grouped under the notion of health literacy (11, 71). Insofar as misinformation is available online in digital form, considerations such as experience with digital technologies are also important in predicting misinformation engagement (50, 86). Attempting to link misinformation exposure to health disparities will require that we consider the range of literacy skills demonstrated by various groups and how that might relate to misinformation exposure and health outcomes.

MISINFORMATION AND HEALTH DECISION-MAKING

Misinformation can affect decision-making about behavior. A substantial proportion of behavioral theory related to health outcomes explains volitional, or consciously chosen, behavior as a function of cognition as well as of emotion reflected in cognition. As an example, consider the family of theories developed by Fishbein & Ajzen over time (such as the theory of reasoned action, the theory of planned behavior, and subsequent iterations) (36). The reasoned action approach holds that a person's intention to perform a behavior is an immediately proximal predictor of behavior. Intention, in turn, is a function of attitudinal or normative beliefs or perceptions of necessary skills. Similarly, research on the health belief model has highlighted constructs such as perceived barriers, personal susceptibility, perceived benefits, and self-efficacy beliefs as constraints on individual decisions about whether to perform a behavior (24, 76). From a communication campaign or persuasion perspective, those attempting to influence behavior can use information—or misinformation—to shape precursors of intention, including attitudes concerning the behavior (e.g., one's approval,

disapproval, neutrality, or disinterest toward the behavior), beliefs about subjective norms, and perceptions about one's confidence in performing the behavior (37).

To illustrate possibilities of misinformation influence, we can consider several examples of prominent misinformation highlighted by Swire-Thompson & Lazer in their 2020 review of online health misinformation, including the notions that apricot seeds can cure cancer, that mouthwash can cure a cold or sore throat, and that the measles-mumps-rubella (MMR) vaccines cause autism. As Swire-Thompson & Lazer (93) note, such claims can encourage negative health outcomes. For example, consuming too many apricot seeds could lead to cyanide poisoning, substituting mouthwash for rest or isolation could facilitate the spread of viral disease, and reduced MMR vaccination in the United States has facilitated measles outbreaks. In each case, acceptance of the stated claim could encourage or discourage behavior that could have health consequences, such as dietary behavior with unintended outcomes or dietary behavior that displaces recommended medical treatment.

Such theoretical accounting of information influences on behavior nonetheless often does not include structural or resource barriers that physically constrain behavior, which is one reason why misinformation alone theoretically cannot account for all human behavior related to health. Correcting misinformation, in turn, is also limited as a strategy for behavior change to reduce health disparities. As Cappella et al. (21) note in their review of tobacco-related misinformation research, “[s]imply assuming that education through acquisition of correct information will enhance behavior change is naïve and contrary to much available evidence” (p. 65). Nonetheless, insofar as health-related behavior does reflect cognitive perceptions, health misinformation could complicate relevant decision-making.

MISINFORMATION AND HEALTH DISPARITY FACTORS

For our discussion, we must ask whether we can expect misinformation to hold effects that account for disparities in health outcomes between groups with different historical experiences. The simple prominence of false claims about apricot seeds in a public information environment is insufficient for that claim to be responsible for unjust differences in health outcomes when comparing various demographic groups. We need to turn to differences in misinformation exposure or effects. To adequately explore a potential relationship between misinformation exposure and disparities in health outcomes, we consider evidence of misinformation exposure differences between groups that have been treated differently historically, evidence of differential effects of misinformation exposure, and accounts of community response to medical information and misinformation.

Physical exposure to information (or misinformation) and cognitive attention focused on that information are crucial elements in any theoretical account linking misinformation and volitional behavior. The sheer prevalence of information (and, by extension, misinformation) predicts subsequent average recognition of that information [e.g., Southwell (84)]. We also know that repetition of misinformation over time can promote subsequent retention of that misinformation (7, 58). What do we know, then, about differences in misinformation exposure as a function of factors associated with health disparities?

Some evidence for inequitable differences between demographic groups related to misinformation exposure lies in accounts of targeted campaigns by industry and advocacy organizations. Tan & Bigman (94) point to decades of targeted efforts by the tobacco industry to reach populations that historically have faced discrimination and disparities, such as Black communities, sexual and gender minorities, and unsheltered populations. McKee (60) also documents relevant tobacco industry actions. Some authors have also raised questions about the ethics of advertising intended for audiences facing health disparities [e.g., Duerksen et al. (34)].

Work on vaccination acceptance has also yielded evidence of explicit efforts to reach audiences comprising people of color. Nartey et al. (68) report on the prevalence of misinformation in online searches, as well as evidence of active promotion of misinformation to Black audiences. For example, the authors investigated specific marketing efforts by antivaccination advocates in predominantly Black US neighborhoods. They found evidence of a series of meetings promoting erroneous claims about vaccines within communities in Compton, California; Atlanta, Georgia; Chicago, Illinois; and Minneapolis, Minnesota. Records from these meetings suggested that purveyors of vaccine-related misinformation have strategically targeted Black people with inaccurate information to encourage support for the antivaccination cause.

Additional evidence of misinformation exposure risk appears in reported encounters with inaccurate health claims in various contexts. Vinck et al. (96) found widespread misperception in the Democratic Republic of the Congo that the 2018 Ebola outbreak was not real. Carson and colleagues (22) interviewed Los Angeles residents who identified as American Indian, Black (referred to in the study as Black/African American), Filipino/Filipina, Latine (referred to as Latino/Latina), or Pacific Islander about their understanding of vaccines and found that participants often referred to conflicting information and misinformation. The authors attribute this misinformation exposure at least in part to an absence of trusted sources of credible information. Calac et al. (20) analyzed Facebook comments in response to a town hall with Dr. Anthony Fauci organized by the Navajo Nation in the fall of 2020 during the early months of the COVID-19 pandemic. Roughly 10% of the comments referred to misinformation in some way, including references to conspiracy theories.

Race and ethnicity are not the only markers of potentially inequitable differences in health outcomes. Socioeconomic status is another predictor of both disparities and misinformation exposure. Harris et al. (43) noted that the widespread availability of health information online has yet to bridge some of the Internet access challenges that many people continue to face. Southwell et al. (88) pointed to the disjuncture between the daily information needs of people with relatively low income and the information that is typically available to them in the United States. Hamilton (41) offers an economic explanation for the information landscape faced by people suffering from poverty: Media outlets in countries such as the United States do not have financial incentive to reach or develop content for people who do not have substantial discretionary income. More recently, Napoli (67) noted potentially dysfunctional aspects of unregulated social media platforms catering to market forces in ways that may disadvantage public interest.

At a societal level, the availability of resources to support rigorous reporting and quality control in information provision can affect the prevalence of misinformation. Cross-national work by Cha and colleagues (23) to assess medical misinformation exposure in 35 countries investigated whether economic conditions in a country predicts resident tendency to report exposure to 11 different items of misinformation related to COVID-19, such as that hot air dryers can kill the virus or that drinking water or tea frequently will cure a COVID-19 infection. They found that the average reported exposure to misinformation items increased as the log of a country's gross domestic product decreased.

Without ready and convenient access to credible, peer-reviewed information, people in search of information about health and well-being appear to turn to trusted local information sources such as personal connections and trusted health care professionals. Kim and colleagues (51) note the importance of social networks and local information sources among people who experience relatively lower socioeconomic status. Similarly, Muñoz-Antonia et al. (64) spoke with Black (referred to as African American in the study) and Hispanic patients in Tampa, Florida, and highlighted the importance of interpersonal channels and patient testimonials for relaying information about cancer.

Differences in Susceptibility to Misinformation

Some authors have noted the potential for differences in misinformation susceptibility from a stance of alarm, and yet that concern has not typically been accompanied by specific evidence. Seo et al. (79) reported that “low-income African American older adults” are “one of the groups most vulnerable to misinformation online” (p. 2012). Seo and colleagues surveyed older Black (referred to by Seo as African American) adults who reported relatively low income and resided in a city in the US Midwest. They found that study respondents tended to face challenges in discerning the credibility of claims about vaccines and disease transmission prevention in children. Factors such as education and involvement with the topic predicted judgments of message content and source credibility, yet how the sample compares with other groups is also not clear.

We should be careful not to infer misinformation susceptibility (beyond physical exposure) from patterns of health behavior. Relevant to this point, Laurencin and colleagues (55) reviewed evidence on vaccine acceptance. They noted the lack of vaccine uptake among Black people in the United States as well as relevant misinformation circulating in Black communities. At the same time, however, they also noted that other demographic groups, such as religiously conservative White Americans, have had similar rates of vaccine acceptance as have Black Americans and yet seem to be less frequently highlighted in recent research studies.

One of the dangers of inferring attitude toward misinformation solely from reported patterns of health behavior among people facing health disparities is the possibility of inappropriately characterizing groups as resistant to accurate information from scientific institutions. White (100) [as well as Brandon et al. (17)], for example, pointed to erroneous inferences made by some researchers regarding racial differences in explicit awareness of the Tuskegee Study of Untreated Syphilis, when it is unclear whether direct and conscious awareness of that specific historical event is responsible for current mistrust of medical institutions among Black people. Further evidence of the danger of assuming inherent demographic differences in information acceptance was reported in a Pew Research Center study of approaches to information engagement among Americans (45). This study characterized people’s reported approaches to seeking and accepting information in terms of a spectrum of information engagement. Based on survey responses, Horrigan (45) grouped people into classifications such as confident, doubtful, and eager and willing, suggesting that some people are confident that they can navigate their information environments, some people are generally leery of information sources, and others are actively interested in learning new information, as well as in honing their digital literacy skills. Approximately half of the people in the “eager and willing” category in Horrigan’s study were Black (21%) or Hispanic (31%), suggesting somewhat disproportionate enthusiasm for accurate information engagement (rather than suggesting an interpretation of cynicism or disengagement) among underserved or marginalized racial and ethnic minority groups, at least in that study.

What do we know about people’s awareness of their misinformation exposure? Do we have evidence of whether people’s ability to identify health or medical misinformation as inaccurate and not true varies? We have relatively little evidence of the extent to which people explicitly recognize as misinformation false health claims in the public information environment, let alone any evidence on demographic comparisons of such misinformation awareness (15). Most medical misinformation research to date has focused on either the prevalence of such claims or on inference as to effects rather than on awareness of misinformation as being false.

If we turn to work on individual acceptance of erroneous beliefs as being true, we find some evidence that groups that have faced discrimination also tend to accept certain elements of health misinformation. Ross et al. (77) reported on beliefs about the origin of HIV as a genocidal conspiracy among a sample of survey participants in Houston, Texas. They found that Black (referred

to in the study as African American) and Latine (referred to as Latino) participants were more likely to accept that claim than were non-Latine White participants. Bogart et al. (14) similarly reported that conspiracy-related beliefs discouraged medication adherence among Black (referred to by Bogart as African American) men with HIV. In another example, Austin et al. (5) present evidence suggesting that respondents of color reported more acceptance of erroneous claims about COVID-19 misinformation (such as the notion that 5G radiation is the actual cause of COVID-19) compared to White counterparts.

How might we make sense of the limited research that indicates differences between demographic groups in their health misinformation acceptance, in other words, their professed belief in claims considered to be false by researchers? Careful examination suggests underlying mechanisms that signal lived experiences of discrimination, resource challenges, and structural racism. In the case of conspiracy beliefs, the extent to which conspiracy beliefs about institutional actions are related to a tendency to accept health misinformation of all types is an open question. Experienced discrimination against Black and Latine people over time may make belief in claims of intentional harm against a particular group more plausible than would be the case for respondents who have not faced similar discrimination.

Austin et al. (5) highlights another point for consideration: conflation between demographic differences and media literacy. What Austin and colleagues label as science media literacy—measured with a series of items about conceptual understanding of the process of science research—also mattered in explaining misinformation acceptance and likely accounts for at least some of the racial differences in their study. People of color indicated relatively less science media literacy, and people with relatively less science media literacy were more likely to accept COVID-19 misinformation when compared with their peers. Moreover, the nature of the relationship between their measure of science media literacy and acceptance of COVID-19 misinformation was similar in White participants and participants of color. Various forms of literacy—science media literacy [as in Austin et al. (5)], health literacy, and digital literacy—likely help account for the acceptance of misinformation once exposed. We discuss the notion of various literacies further in the next section.

The general lack of evidence of differences in the acceptance of misinformation after controlling for exposure, technical expertise, or experienced discrimination is predictable given literature on cognitive psychology regarding human information processing. Late twentieth-century and early twenty-first-century psychology research has tended to support the idea that all humans accept new information as a default condition and then subsequently tag it as being true or false rather than being able to somehow detect false information initially (4, 38, 81). That observation essentially levels the playing field for all humans in terms of the inherent capacity to process information and misinformation, meaning that observed differences in misinformation exposure and acceptance likely reflect systemic resource disparities.

Health Literacy and (Digital) Media Literacy as Explanations for Misinformation Effects

The extent to which people eventually interpret and assess information after initial exposure varies. Two important factors in that interpretation involve the notions of health literacy and digital literacy. Although the concept of literacy (and specifically health literacy) has evolved considerably over time (6, 71), Berkman et al. (11) offer a useful consensus definition in describing health literacy as the “degree to which individuals can obtain, process, understand, and communicate about health-related information needed to make informed health decisions” (p. 16). We can also consider media literacy or digital literacy as it affects engagement with health-related information.

Kemp et al. (50) define the similarly relevant notion of “digital health literacy” as “capabilities and resources required for individuals to use and benefit from digital health resources” (p. 104).

Research has suggested theoretical alignment between factors contributing to health disparities and related concepts such as social support and various literacies [e.g., Christy et al. (27), Institute of Medicine Roundtable on Health Literacy (46), Lee et al. (56), Pérez-Stable & El-Toukhy (75)]. This research on health literacy and digital media literacy may help explain how misinformation exposure and health disparities could be related. As Mantwill et al. (57) have noted, however, the exact nature of the relationships between concepts such as health literacy and health disparities is not explicitly specified often in available literature.

Health literacy measurement has varied considerably in available literature (59). Some health literacy measures such as the European Health Literacy Survey Questionnaire depend on subjective self-reported difficulty with various information tasks [see Nutbeam & Lloyd (72) for discussion]. Other studies of health literacy rely on skill-based measures, such as the Rapid Estimate of Adult Literacy in Medicine (REALM), the REALM-R (10, 32), or the Newest Vital Sign (99), to measure health literacy based on performance rather than on subjective self-report. Across the breadth of health literacy research, we find some indication that health literacy affects one’s judgment of information accuracy and is associated with media diet tendencies that might raise the risk of misinformation exposure.

How might health literacy affect a person’s susceptibility to health or medical misinformation? As Squiers et al. (92) note, health literacy can facilitate or complicate information seeking, interpretation, and decision-making, thereby impacting consequences for health outcomes. We see evidence of some of those theoretical possibilities in work by Chen et al. (25). Chen and colleagues conducted a survey that assessed the health literacy of participants (using the Newest Vital Sign measure) as well as media use and reported trust of health information. They found that one’s level of health literacy was associated with their likelihood of using institutional medical websites and relying on such channels as television or social media outlets. Specifically, individuals reporting lower health literacy tended to report less engagement with medical websites and more engagement with television and social media. One’s health literacy skills predict exposure to direct reports of peer-reviewed medical information as well as to television and social media content (which is likely relatively mixed in its presentation of peer-reviewed evidence). Moreover, outlets such as television and social media platforms tend to present more misinformation on any given topic than do institutional medical websites (although even peer-reviewed publications can contain factual errors that warrant retraction).

If health literacy is predictive of misinformation exposure, what do we know about the extent to which groups that experience health disparities also benefit from health literacy? Some studies describe absolute levels of measured health literacy among demographic groups in relation to an implied ideal to suggest challenges. Davis et al. (31), for example, suggest that older Black Americans report significant limits in health literacy. Among the older Black American participants in their study sample, approximately 52% of participants had “limited health literacy” (as measured by the REALM-R indicator). Although notable, descriptive evidence among a sample composed of only a particular demographic group alone does not offer evidence about levels of health literacy relative to other groups.

Some broader health literacy studies have included demographic comparison. Nutbeam & Lloyd (72) pointed to national surveys that suggest health literacy varies as a function of social standing: Analysis of data from eight European countries demonstrated that socioeconomic status predicted perceived health literacy skills as assessed by the European Health Literacy Survey Questionnaire (74). Christy and colleagues (27) also present evidence of variance in health literacy as a function of health disparity predictors in their study of colorectal cancer perceptions:

Reported racial identity predicted health literacy skills over and above factors such as employment, education, and religious beliefs; e.g., participants classified as a member of a racial or ethnic minority group scored less well on a REALM-R assessment than did their counterparts. The Christy et al. study, however, did not extensively measure medical training or education, and it is unclear what accounts for the racial differences noted. Christy and colleagues were careful to suggest that the association between racial identity and health literacy does not suggest that it is appropriate to use racial identity to identify individuals with relatively lower health literacy.

Digital media literacy can affect how individuals process health or medical misinformation they encounter. Digital media literacy and health literacy appear to be related (28, 43). Smith & Magnani (82), for example, point out a tendency for those with relatively fewer health literacy skills to also have fewer digital media skills. Markers of inequity, such as educational attainment, predict electronic health information engagement, including communicating online with health care providers or using electronic tools to track diet (53). Those who report or demonstrate relatively few skills in navigating electronic health information tend to suffer from more chronic health conditions (70).

Even as we consider possibilities for literacy skills to affect misinformation interpretation, we should also note the empirical limits of evidence indicating that literacy skills drive the spread of misinformation. Using experimental evidence, Sirlin and colleagues (80) demonstrated that while digital literacy was associated with the ability to discern falsehood, it was not predictive of individuals' intention to share misinformation. Confusion about the credibility of information or misinformation is not necessarily the same as the likelihood of sharing misinformation with peers.

Implications for Interventions to Mitigate Misinformation and Address Health Disparities

Organizations have attempted to address the challenges of misinformation through communication efforts in several ways, including so-called fact-checking efforts that denounce individual inaccurate claims, efforts to bolster health literacy skills or media literacy skills in audiences, and community engagement efforts that build relationships between people and institutions to improve individual access to information that meets their needs. Whether educational approaches alone can counter systemic health disparities remains an open question. Regarding health literacy improvement, for example, Nutbeam & Lloyd (72) concluded that some interventions to improve health literacy among populations at higher risk for health challenges have shown promise but also that evidence for health literacy as a strategy to improve health status overall is limited. Nonetheless, certain approaches for misinformation mitigation afford a more appealing ratio of potential benefit and harm than do others.

Direct refutation and correction of misinformation can address specific misperceptions, such as misunderstanding stemming from inaccurate claims about prescription drugs [e.g., Aikin et al. (2, 3)] or retraction of errors in news articles [e.g., Ecker et al. (35)]. Literature on misinformation correction suggests that intervention efforts ideally will explicitly correct specific facts that have been stated previously; misinformation correction appears to be less successful in cases in which inaccurate claims have been implied or are the result of inappropriate data omission (2). In instances in which a single inaccurate claim poses potential grave threat to any community, widely broadcasted correction that clearly and directly refutes that claim could be useful. Nonetheless, the dilemma of misinformation often extends beyond any short-term emergency involving any single claim.

Some evidence suggests that organizational efforts to correct misinformation may reinforce disparities because of unequal distribution of corrective effort in ways that reflect existing inequity. Blake et al. (12), for example, found that survey respondents reported that engagement

with court-ordered tobacco-related corrective statements by the judicial system appeared to reflect a person's own socioeconomic status and educational attainment. Socioeconomic status and education play a role in whether a person even sees corrective information that has been required by courts to mitigate erroneous claims promoted by the tobacco industry.

Another form of misinformation intervention that has emerged has been proactive effort by electronic information outlets, such as social media platforms, to label inaccurate content or to lower the prominence of such content in presentation algorithms. As Saltz and colleagues (78) have noted, many Americans—roughly half of those in a nationwide survey—have encountered interventions such as credibility labels assigned to social media posts. Evidence for whether such labeling affects misinformation acceptance is mixed. Some studies have found that labels can discourage misinformation sharing [e.g., Mena (61)], whereas evidence for effects such as reduced acceptance of inaccurate claims is also contested. Oeldorf-Hirsch et al. (73) did not find such effects when inaccurate claims were labeled as such, but Bode & Vraga (13) did find that immediate placement of corrective information adjacent to erroneous claims on a social media platform discouraged misperceptions.

Saltz and colleagues' (78) work on social media intervention awareness is telling in terms of their analysis of Americans' tolerance of such interventions. They found that reported trust in the organization implementing the intervention in question is related to a person's acceptance of such intervention. Transparency and clear understanding of the motive for intervention appear to be vital to individual support for intervention efforts. Even when attempting to directly constrain problematic content and reduce misinformation exposure for the benefit of an audience, acknowledging relationships with that audience will be important.

Trust appears to be multifaceted: Although perceptions of credibility and consistency are clearly prominent in how people tend to define trust, some research suggests that people consider the extent to which they share interests or values with an institution in assessing how much they trust that institution [e.g., Southwell et al. (83)]. Dale and colleagues (29) note the importance of historical trauma in understanding patterns of trust and mistrust. Such trauma often involves systemic racism, discrimination, and abuse, meaning that a lack of trust is a signal of disparity given that it sometimes stems from historical violence that fostered current resource discrepancies. Therefore, ongoing relationships between individuals and institutions, or at least the ways in which individuals understand those relationships, can constrain possibilities for misinformation mitigation. Additionally, the absence of such relationships can likely pose an important barrier to collaborative engagement to address misinformation.

Insofar as misinformation exposure indicates the absence of trusted relationships between people and credible health care organizations or a lack of access to useful medical information, fact-checking and misinformation correction efforts do not seem to offer a sustainable or sufficiently extensive remedy. Alternately, community engagement approaches rooted in relationship building over time appear to hold promise in establishing trusted communication networks that can begin to mitigate some health disparities. An example is the Project PLACE experience, which systematically established a multicounty coalition of community partners to facilitate the investigation of cancer incidence and outcomes in North Carolina (9). Project PLACE partner organizations represented Black, Asian, Latine, White, Muslim, Christian, and lesbian, gay, bisexual, transsexual, queer, intersex, and asexual populations and included respondents from both rural and urban communities across the state. In addition to organizational partnerships, project organizers attribute project success to their effort to meet community members in person and collect survey responses face-to-face rather than exclusively through a web portal. Such experience suggests that efforts to mitigate misinformation in communities experiencing inequitable health outcomes should

acknowledge and reflect local organizational relationships rather than depend on broadcast methods such as national or state-level media campaigns. Local ties matter.

Compassionate communication and relationship building require considerable time and effort but nonetheless appear to be key strategies to mitigate misinformation among communities experiencing health disparities. Laurencin et al. (55) recommend an approach to addressing misperceptions among Black communities regarding COVID-19 vaccination that dovetails with our discussion. Rather than focusing on removal of misinformation or fact-checking as a first step for intervention, they emphasize asking questions, acknowledging and addressing answers offered by community members, and explicitly affirming the validity of community members' underlying values and concerns whenever possible. Similarly, a stance of compassion and engagement is at the heart of recent recommendations cited by the US Surgeon General for training clinicians on how to handle conversations with patients about misinformation (65, 90, 91). Recent recommendations by National Cancer Institute researchers to move “beyond fact-checking” in addressing misinformation resonate with this general theme (26). For decades, comprehensive reviews of community-based research and intervention have emphasized the vital importance of collaboration between various community stakeholders in generating communication intervention [e.g., Israel et al. (48)]. We can apply this thinking to considerations for misinformation mitigation in service to people facing health disparities; e.g., the US National Institutes of Health has sought to mitigate COVID-19 misinformation by encouraging collaborations between academic institutions and community organizations (98). Common to these approaches is to move away from—or to supplement—myth-busting campaigns and to turn toward building relationship infrastructure that will offer access to timely and credible information in the face of future health crises.

CONCLUSION

The persistence of health disparities is a pressing public health concern. The role of misinformation in generating or perpetuating health disparities is theoretically unclear based on available evidence, although misinformation exposure poses an additional burden for those lacking adequate access to various health care resources. People facing inequity in health outcomes are relatively likely to encounter health misinformation in lieu of more useful information, but we do not have clear evidence that the coexistence of misinformation exposure leads directly to inequitable health outcomes. Evidence suggests structural reasons for misinformation exposure rather than an affinity for low-quality information among people who have faced racism and discrimination. The most promising strategies for mitigating the decision-making complications associated with misinformation exposure among populations facing relatively poor health outcomes involve a stance of compassion and relationship building among health care organizations, communities, and individual patients to build and maintain trust and ensure consistent access to useful information rather than a reliance solely on widely broadcast fact-checking campaigns.

SUMMARY POINTS

1. The prevalence of both health-related misinformation and health disparities poses substantial challenges for public health.
2. The relationships between misinformation exposure and health disparities have been insufficiently explored in available literature; assumptions of simple causal relationships

between misinformation exposure and health disparities, for example, do not enjoy robust empirical support.

3. Mitigating the influence of misinformation among people experiencing inequitable health outcomes relative to others requires that we consider relationships between people and health care institutions as well as factors such as trust and structural barriers to information access.

DISCLOSURE STATEMENT

The authors are not aware of any affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review.

ACKNOWLEDGMENTS

The authors are thankful for the support from colleagues associated with the Duke Program on Medical Misinformation, the Duke Clinical and Translational Science Institute, and the Duke Initiative for Science & Society. Our review also benefited from discussions with colleagues working with the Science in the Public Sphere program and the *All of Us* Researcher Academy at RTI International.

LITERATURE CITED

1. Acevedo N. 2021. Latinos more likely to get, consume and share online misinformation, fake news. *NBC News*, Oct. 6. <https://www.nbcnews.com/news/latino/latinos-likely-get-consume-share-online-misinformation-fake-news-rcna2622>
2. Aikin KJ, Betts KR, O'Donoghue AC, Rupert DJ, Lee PK, et al. 2015. Correction of overstatement and omission in direct-to-consumer prescription drug advertising. *J. Commun.* 65(4):596–618
3. Aikin KJ, Southwell BG, Paquin RS, Rupert DJ, O'Donoghue AC, et al. 2017. Correction of misleading information in prescription drug television advertising: the roles of advertisement similarity and time delay. *Res. Soc. Adm. Pharm.* 13:378–88
4. Asp E, Manzel K, Koestner B, Cole CA, Denburg NL, Tranel D. 2012. A neuropsychological test of belief and doubt: damage to ventromedial prefrontal cortex increases credulity for misleading advertising. *Front. Neurosci.* 6:100
5. Austin EW, Borah P, Domgaard S. 2021. COVID-19 disinformation and political engagement among communities of color: the role of media literacy. *Harvard Kennedy School Misinformation Rev.* 1(7). <https://doi.org/10.37016/mr-2020-58>
6. Baker DW. 2006. The meaning and measure of health literacy. *J. Gen. Intern. Med.* 21:878–83
7. Barber SJ, Rajaram S, Marsh EJ. 2008. Fact learning: how information accuracy, delay, and repeated testing change retention and retrieval experience. *Memory* 16(8):934–46
8. Barrett NJ, Hasan M, Bethea K, Johnson KS. 2020. The fierce urgency of now: addressing racial and ethnic disparities in serious illness care. *N. C. Med. J.* 81(4):254–56
9. Barrett NJ, Ingraham KL, Bethea K, Hwa-Lin P, Chirinos M, et al. 2020. Project PLACE: enhancing community and academic partnerships to describe and address health disparities. *Adv. Cancer Res.* 146:167–88
10. Bass PF III, Wilson JF, Griffith CH. 2003. A shortened instrument for literacy screening. *J. Gen. Intern. Med.* 18:1036–38
11. Berkman ND, Davis TC, McCormack L. 2010. Health literacy: What is it? *J. Health Commun.* 15(2):9–19
12. Blake KD, Willis G, Kaufman A. 2020. Population prevalence and predictors of self-reported exposure to court-ordered, tobacco-related corrective statements. *Tob. Control* 29:516–21

13. Bode L, Vraga EK. 2015. In related news, that was wrong: the correction of misinformation through related stories functionality in social media. *J. Commun.* 65(4):619–38
14. Bogart LM, Wagner G, Galvan FH, Banks D. 2010. Conspiracy beliefs about HIV are related to antiretroviral treatment nonadherence among African American men with HIV. *J. Acquir. Immune Defic. Syndr.* 53(5):648–55
15. Boudewyns V, Southwell BG, Betts KR, Gupta CS, Paquin RS, et al. 2018. Awareness of misinformation in health-related advertising: a narrative review of the literature. See Ref. 89, pp. 35–50
16. Boulware LE, Mohottige D. 2021. The seen and the unseen: race and social inequities affecting kidney care. *Clin. J. Am. Soc. Nephrol.* 16(5):815–17
17. Brandon DT, Isaac LA, LaVeist TA. 2005. The legacy of Tuskegee and trust in medical care: Is Tuskegee responsible for race differences in mistrust of medical care? *J. Natl. Med.* 97(7):951–56
18. Braveman P. 2006. Health disparities and health equity: concepts and measurement. *Annu. Rev. Public Health* 27:167–94
19. Braveman P, Gruskin S. 2003. Defining equity in health. *J. Epidemiol. Commun. Health* 57:254–58
20. Calac AJ, Bardier C, Cai M, Mackey TK. 2021. Examining Facebook community reaction to a COVID-19 vaccine trial on the Navajo Nation. *Am. J. Public Health* 111(8):1428–30
21. Cappella JN, Ophir Y, Sutton J. 2018. The importance of measuring knowledge in the age of misinformation and challenges in the tobacco domain. See Ref. 89, pp. 51–70
22. Carson SL, Casillas A, Castellon-Lopez Y, Mansfield LN, Morris D, et al. 2021. COVID-19 vaccine decision-making factors in racial and ethnic minority communities in Los Angeles, California. *JAMA Netw. Open* 4(9):e2127582
23. Cha M, Cha C, Singh K, Lima G, Ahn Y-Y, et al. 2021. Prevalence of misinformation and factchecks on the COVID-19 pandemic in 35 countries: observational infodemiology study. *JMIR Hum. Factors* 8(1):e23279
24. Champion VL, Skinner CS. 2008. The health belief model. In *Health Behavior and Health Education: Theory, Research, and Practice*, ed. K Glanz, BK Rimer, K Visanath, pp. 45–66. Hoboken, NJ: Jossey-Bass. 4th ed.
25. Chen X, Hay JL, Waters EA, Kiviniemi MT, Biddle C, et al. 2018. Health literacy and use and trust in health information. *J. Health Commun.* 23(8):724–34
26. Chou W-YS, Gaysynsky A, Vanderpool RC. 2021. The COVID-19 misinfodemic: moving beyond fact-checking. *Health Educ. Behav.* 48(1):9–13
27. Christy SM, Gwede CK, Sutton SK, Chavarria E, Davis SN, et al. 2017. Health literacy among medically underserved: the role of demographic factors, social influence, and religious beliefs. *J. Health. Commun.* 22(11):923–31
28. Coughlin SS, Stewart JL, Young L, Heboyan V, De Leo G. 2018. Health literacy and patient web portals. *Int. J. Med. Inform.* 113:43–48
29. Dale SK, Bogart LM, Wagner GJ, Galvan FH, Klein DJ. 2016. Medical mistrust is related to lower longitudinal medication adherence among African-American males with HIV. *J. Health Psychol.* 21(7):1311–21
30. Davis JL, Gandy OH Jr. 1999. Racial identity and media orientation: exploring the nature of constraint. *J. Black Stud.* 29(3):367–97
31. Davis SN, Wischhusen JW, Sutton SK, Christy SM, Chavarria EA, et al. 2020. Demographic and psychosocial factors associated with limited health literacy in a community-based sample of older Black Americans. *Patient Educ. Couns.* 103(2):385–91
32. Davis TC, Long SW, Jackson RH, Mayeaux EJ, George RB, et al. 1993. Rapid estimate of adult literacy in medicine: a shortened screening instrument. *Fam. Med.* 25:391–95
33. Diez Roux AV. 2012. Conceptual approaches to the study of health disparities. *Annu. Rev. Public Health* 33:41–58
34. Duerksen SC, Mikail A, Tom L, Patton A, Lopez J, et al. 2005. Health disparities and advertising content of women's magazines: a cross-sectional study. *BMC Public Health* 5:85
35. Ecker UK, Lewandowsky S, Fenton O, Martin K. 2014. Do people keep believing because they want to? Preexisting attitudes and the continued influence of misinformation. *Mem. Cognit.* 42(2):292–304

36. Fishbein M, Ajzen I. 2010. *Predicting and Changing Behavior: The Reasoned Action Approach*. New York: Psychology Press
37. Fishbein M, Yzer MC. 2003. Using theory to design effective health behavior interventions. *Commun. Theory* 13:164–83
38. Gilbert DT, Krull DS, Malone PS. 1990. Unbelieving the unbelievable: some problems in the rejection of false information. *J. Pers. Soc. Psychol.* 59:601–13
39. Glasgow LM. 2020. Beyond lip service: taking a genuine approach to tackling COVID-19 (and all) Black-White health disparities in the United States. *Health Affairs Forefront*, June 9. <https://www.healthaffairs.org/doi/10.1377/forefront.20200604.585088/full/>
40. Greene CM, Murphy G. 2021. Quantifying the effects of fake news on behavior: evidence from a study of COVID-19 misinformation. *J. Exp. Psychol. Appl.* 27(4):773–84
41. Hamilton JT. 2004. *All the News That's Fit to Sell: How the Market Transforms Information into News*. Princeton, NJ: Princeton Univ. Press
42. Hammonds EM, Reverby SM. 2019. Toward a historically informed analysis of racial health disparities since 1619. *Am. J. Public Health* 109(10):1348–49
43. Harris K, Jacobs G, Reeder J. 2019. Health systems and adult basic education: a critical partnership in supporting digital health literacy. *Health Lit. Res. Pract.* 3(3 Suppl.):S33–36
44. Hill L, Artiga S, Haldar S. 2022. Key facts on health and health care by race and ethnicity. *KFF*, Jan. 26. <https://www.kff.org/racial-equity-and-health-policy/report/key-facts-on-health-and-health-care-by-race-and-ethnicity/>
45. Horrigan JB. 2017. How people approach facts and information. *Pew Research Center*, Sept. 11. <http://www.pewinternet.org/2017/09/11/how-people-approach-facts-and-information/>
46. Inst. Med. Roundtable Health Lit. 2011. Health literacy and health disparities: opportunities for trans-disciplinary collaboration. In *Innovations in Health Literacy Workshop Summary: 3*, rapp. C Vancheri, pp. 7–11. Washington, DC: Natl. Acad. Press
47. Ioannidis J, Stuart ME, Brownlee S, Strite SA. 2017. How to survive the medical misinformation mess. *Eur. J. Clin. Invest.* 47(11):795–802
48. Israel BA, Schulz AJ, Parker EA, Becker AB. 1998. Review of community-based research: assessing partnership approaches to improve public health. *Annu. Rev. Public Health* 19:173–202
49. Jaiswal J, LoSchiavo C, Perlman DC. 2020. Disinformation, misinformation and inequality-driven mistrust in the time of COVID-19: lessons unlearned from AIDS denialism. *AIDS Behav.* 24:2776–80
50. Kemp E, Trigg J, Beatty L, Christensen C, Dhillon HM. 2021. Health literacy, digital health literacy and the implementation of digital health technologies in cancer care: the need for a strategic approach. *Health Promot. J. Austr.* 32(S1):104–14
51. Kim Y-C, Matsaganis MD, Wilkin HA, Jung J-Y, eds. 2018. *The Communication Ecology of 21st Century Urban Communities*. New York: Peter Lang
52. King AJ, Lazard AJ. 2020. Advancing visual health communication research to improve infodemic response. *Health Commun.* 35(14):1723–28
53. Kontos E, Blake KD, Chou W-Y, Prestin A. 2014. Predictors of eHealth usage: insights on the digital divide from the Health Information National Trends Survey. *J. Med. Internet Res.* 16:e172
54. Larson HJ. 2018. The biggest pandemic risk? Viral misinformation. *Nature* 562(7727):309
55. Laurencin CT, Valentine H, Yancy C, Jones CP, Bright C. 2021. The COVID-19 vaccine and the Black community: addressing the justified questions. *J. Racial Ethn. Health* 8(4):809–20
56. Lee S-YD, Arozullah AM, Cho YI. 2004. Health literacy, social support, and health: a research agenda. *Soc. Sci. Med.* 58:1309–21
57. Mantwill S, Monestel-Umaña S, Schulz PJ. 2015. The relationship between health literacy and health disparities: a systematic review. *PLOS ONE* 10(12):e0145455
58. Marsh EJ, Yang BW. 2018. Believing things that are not true: a cognitive science perspective on misinformation. See Ref. 89, pp. 15–34
59. McCormack L, Haun J, Sørensen K, Valerio M. 2013. Recommendations for advancing health literacy measurement. *J. Health Commun.* 18(Supp. 1):9–14
60. McKee M. 2017. The tobacco industry: the pioneer of fake news. *J. Public Health Res.* 6(1):878

61. Mena P. 2020. Cleaning up social media: the effect of warning labels on likelihood of sharing false news on Facebook. *Policy Internet* 12(2):165–83
62. Mheidly N, Fares J. 2020. Leveraging media and health communication strategies to overcome the COVID-19 infodemic. *J. Public Health Policy* 41(4):410–20
63. Morley J, Cowls J, Taddeo M, Floridi L. 2020. Public health in the Information Age: recognizing the infosphere as a social determinant of health. *J. Med. Internet Res.* 22(8):e19311
64. Muñoz-Antonia T, Ung D, Montiel-Ishino FA, Nelson A, Canales J, Quinn GP. 2015. African Americans' and Hispanics' information needs about cancer care. *J. Cancer Educ.* 30(2):327–32
65. Murthy VH. 2021. *Confronting health misinformation: the US Surgeon General's advisory on building a healthy information environment.* Rep., Off. Surg. Gen., Washington, DC. <https://www.hhs.gov/sites/default/files/surgeon-general-misinformation-advisory.pdf>
66. Nana-Sinkam P, Kraschnewski J, Sacco R, Chavez J, Fouad M, et al. 2021. Health disparities and equity in the era of COVID-19. *J. Clin. Transl. Sci.* 5(1):e99
67. Napoli PM. 2019. *Social Media and the Public Interest: Media Regulation in the Disinformation Age.* New York: Columbia Univ. Press
68. Nartey S-R, Temte J, Petty E. 2021. Combatting anti-vaccination misinformation: improving immunization rates of Black/African American children at UW Health. *Wis. Med. J.* 120(Suppl. 1):S31–38
69. Natl. Acad. Med. 2022. Lemon juice does not cure COVID-19. *National Academies of Sciences, Engineering, and Medicine.* <https://www.nationalacademies.org/based-on-science/lemon-juice-does-not-cure-covid-19>
70. Neter E, Brainin E. 2012. eHealth literacy: extending the digital divide to the realm of health information. *J. Med. Internet Res.* 14:e19
71. Nutbeam D. 2008. The evolving concept of health literacy. *Soc. Sci. Med.* 67:2072–78
72. Nutbeam D, Lloyd JE. 2021. Understanding and responding to health literacy as a social determinant of health. *Annu. Rev. Public Health* 42:159–73
73. Oeldorf-Hirsch A, Schmierbach M, Appelman A, Boyle MP. 2020. The ineffectiveness of fact-checking labels on news memes and articles. *Mass Commun. Soc.* 23(5):682–704
74. Pelikan JM, Ganahl K, Roethlin F. 2018. Health literacy as a determinant, mediator and/or moderator of health: empirical models using the European Health Literacy Survey dataset. *Glob. Health Promot.* 25(4):57–66
75. Pérez-Stable EJ, El-Toukhy S. 2018. Communicating with diverse patients: how patient and clinician factors affect disparities. *Patient Educ. Couns.* 101(12):2186–94
76. Rosenstock IM, Strecher VJ, Becker MH. 1988. Social learning theory and the health belief model. *Health Educ. Q.* 15(2):175–83
77. Ross MW, Essien EJ, Torres I. 2006. Conspiracy beliefs about the origin of HIV/AIDS in four racial/ethnic groups. *J. Acquir. Immune Defic. Syndr.* 41(3):342–44
78. Saltz E, Barari S, Leibowicz CR, Wardle C. 2021. Misinformation interventions are common, divisive, and poorly understood. *Harvard Kennedy School Misinformation Rev.* 2(5). <https://doi.org/10.37016/mr-2020-81>
79. Seo H, Blomberg M, Altschwager D, Vu HT. 2021. Vulnerable populations and misinformation: a mixed-methods approach to underserved older adults' online information assessment. *New Media Soc.* 23(7):2012–33
80. Sirlin N, Epstein Z, Arechar AA, Rand DG. 2021. Digital literacy is associated with more discerning accuracy judgments but not sharing intentions. *Harvard Kennedy School Misinformation Rev.* 2(6). <https://doi.org/10.37016/mr-2020-83>
81. Skurnik I, Yoon C, Park DC, Schwarz N. 2005. How warnings about false claims become recommendations. *J. Consum. Res.* 31(4):713–24
82. Smith B, Magnani JW. 2019. New technologies, new disparities: the intersection of electronic health and digital health literacy. *Int. J. Cardiol.* 292:280–82
83. Southwell B, Corin D, Eck M, Hessenius A, Li L, et al. 2021. Dimensions of trust and information seeking on natural disasters, hazards, and extreme weather in North Carolina (USA). *EMS Annu. Meet. Abstr.* 18:EMS2021–25

84. Southwell BG. 2005. Between messages and people: a multilevel model of memory for television content. *Commun. Res.* 32(1):112–40
85. Southwell BG. 2013. *Social Networks and Popular Understanding of Science and Health: Sharing Disparities*. Baltimore, MD: Johns Hopkins Univ. Press
86. Southwell BG, Anghelcev G, Himelboim I, Jones J. 2007. Translating user control availability into perception: the moderating role of prior experience. *Comp. Hum. Behav.* 23(1):554–63
87. Southwell BG, Brennen JSB, Paquin R, Boudewyns V, Zeng J. 2022. Defining and measuring scientific misinformation. *Ann. Am. Acad. Political Soc. Sci.* 700:98–111
88. Southwell BG, Hamilton JT, Slater JS. 2011. Why addressing the poor and underinsured is vexing. *Health Commun.* 26(6):583–85
89. Southwell BG, Thorson EA, Sheble L, eds. 2018. *Misinformation and Mass Audiences*. Austin: Univ. Tex. Press
90. Southwell BG, Wood JL, Navar AM. 2020. Roles for health care professionals in addressing patient-held misinformation beyond fact correction. *Am. J. Public Health* 110(S3):S288–89
91. Southwell BG, Wood JL, Navar AM. 2021. Función de los profesionales de la salud de rectificar la información errónea que tienen los pacientes más allá de corregir los hechos. *Rev. Panam. Salud Publica* 45:e60
92. Squiers L, Peinado S, Berkman N, Boudewyns V, McCormack L. 2012. The health literacy skills framework. *J. Health Commun.* 17(Suppl. 3):30–54
93. Swire-Thompson B, Lazer D. 2020. Public health and online misinformation: challenges and recommendations. *Annu. Rev. Public Health* 41:433–51
94. Tan ASL, Bigman CA. 2020. Misinformation about commercial tobacco products on social media—implications and research opportunities for reducing tobacco-related health disparities. *Am. J. Public Health* 110:S281–83
95. US Census Bur. 2022. About the Hispanic population and its origin. *Census.gov*. <https://www.census.gov/topics/population/hispanic-origin/about.html>
96. Vinck P, Pham PN, Bindu KK, Bedford J, Nilles EJ. 2019. Institutional trust and misinformation in the response to the 2018–19 Ebola outbreak in North Kivu, DR Congo: a population-based survey. *Lancet Infect. Dis.* 19:529–36
97. Wallace M, Crear-Perry J, Richardson L, Tarver M, Theall K. 2017. Separate and unequal: structural racism and infant mortality in the US. *Health Place* 45:140–44
98. Webb Hooper M, Nápoles AM, Pérez-Stable EJ. 2021. No populations left behind: vaccine hesitancy and equitable diffusion of effective COVID-19 vaccines. *J. Gen. Intern. Med.* 36(7):2130–33
99. Weiss BD, Mays MZ, Martz W, Castro KM, DeWalt DA, et al. 2005. Quick assessment of literacy in primary care: the newest vital sign. *Ann. Fam. Med.* 3(6):514–22
100. White RM. 2005. Misinformation and misbeliefs in the Tuskegee Study of Untreated Syphilis fuel mistrust in the healthcare system. *J. Natl. Med. Assoc.* 97(11):1566–73
101. Williams DR, Lawrence JA, Davis BA. 2019. Racism and health: evidence and needed research. *Annu. Rev. Public Health* 40:105–25
102. Wilson SL, Wiysonge C. 2020. Social media and vaccine hesitancy. *BMJ Glob. Health* 5(10):e004206
103. Vosoughi S, Roy D, Aral S. 2018. The spread of true and false news online. *Science* 359(6380):1146–51
104. Xiang D, Lehmann LS. 2021. Confronting the misinformation pandemic. *Health Policy Technol.* 10(3):100520

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- Krieger N, Boyd RW, De Maio F, Maybank A. 2021. Medicine’s privileged gatekeepers: producing harmful ignorance about racism and health. *Health Aff. Blog*, April 20. <https://www.healthaffairs.org/doi/10.1377/forefront.20210415.305480/full>
- Krishna A, Thompson TL. 2021. Misinformation about health: a review of health communication and misinformation scholarship. *Am. Behav. Sci.* 65(2):316–32

- Lewandowsky S, Ecker UKH, Cook J. 2017. Beyond misinformation: understanding and coping with the “post-truth” era. *J. Appl. Res. Mem. Cogn.* 6(4):353–69
- Paquin RS, Boudewyns V, Betts KR, Johnson M, O’Donoghue AC, Southwell BG. 2022. An empirical procedure to evaluate misinformation rejection and deception in mediated communication contexts. *Commun. Theory* 32(1):25–47
- Southwell BG, Thorson EA, Sheble L. 2017. The persistence and peril of misinformation. *Am. Sci.* 105(6):372–75