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## **Challenges in Vaccine Communication**

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### **Abstract**

Vaccine communication is a scientifically complex, ethically laden, and highly multidisciplinary area in which to conduct research or practice. Due to vaccination's status as a key topic in public health and medicine, communication about vaccination serves as fertile ground for social scientific and critical research that can both improve health and help us understand health-related values, mental-models, and discourses. This chapter presents background necessary to understand vaccine communication as a topic of study, provides an overview of contemporary communication research about vaccines and vaccination, and describes frameworks for addressing ethical considerations particular to vaccine communication.

**Keywords:** Vaccination, Public Health, Clinical Communication, Mass Communication, Surveillance, Ethics

Vaccination is a key topic in public health that highlights the importance of social science-informed approaches to health communication. Recent waves of vaccine backlash—sometimes fuelled

by misinformation (false content) or deliberate disinformation (false content intended to deceive)—have weakened vaccination levels in communities around the world, increasing risks of vaccine-preventable disease outbreaks. As a result, there is increased recognition that communication, when used effectively, can promote acceptance of vaccination, and that the need for effective vaccine communication has never been more urgent. Additionally, the ways people and institutions communicate about a topic that is socially contentious despite compelling scientific evidence of its benefit may be enlightening to communication scholars, with language and rhetorical devices revealing underlying values and connection between these discourses and broader societal trends.

This chapter will focus on how a communication studies approach can enrich understanding of vaccine communication and vaccine promotion efforts. It will discuss ethical considerations particular to vaccine communication and call for the integration of communication and information ethics in vaccine promotion efforts. Communication and information ethics can offer valuable, critical understanding about vaccine communication, and can support efforts to improve rates of vaccine uptake. While vaccination is an international concern, and outbreaks of vaccine-preventable disease are increasingly global in reach, the current chapter will primarily focus on affluent settings, where infrastructure to deliver safe and effective vaccination programs is strong, yet pockets of low confidence threaten population vaccine coverage—settings in which communication, persuasion, and trust-building hold the potential to overcome many barriers to eradication of vaccine-preventable illness.

## **Vaccine Communication and Promotion Efforts**

### Vaccine Terminology, Discourses and Rhetoric

A base level of knowledge about vaccination itself is necessary even for communication scholars using methods far removed from a clinical setting. Studies of vaccine communication that fail to understand vaccinology and medical aspects of vaccination may miss important details relevant to

understanding vaccine promotion efforts. Without demonstrated awareness of vaccine science, vaccine communication researchers and practitioners are unlikely to be accepted by public health experts as credible. Conversely, and of critical importance for this chapter, most applied vaccine promotion efforts lack the communication scholar's insight into the uses of discourse, rhetoric, and other communicative techniques that are used by actors in the field to shape vaccination policy and practice.

Vaccines may be defined as "a type of medicine that trains the body's immune system so that it can fight a disease it has not come into contact with before" (Oxford Vaccines Group, 2019).

Terminology can be a challenge when describing, or analysing discourses related to, vaccines. For example, the term vaccination (giving/receiving a vaccine) is sometimes used interchangeably with immunization (the process of acquiring immunity to a pathogen, often following vaccination) (Healthdirect Australia, 2019). This choice in terminology may be indicative of deliberate rhetorical strategies (e.g., attempting to invoke a positive connotation of immunity rather than the negative connotation of injections), or may reveal lack of knowledge, or lack of attention to communicative precision. Similarly, most vaccines are given via injection ('shots' or 'jabs'), but some (e.g., rotavirus, oral polio vaccine) may be given orally or with a nasal spray (such as the nasal influenza vaccine); however, 'shots' or 'jabs' may be casually equated with 'vaccines' in everyday practice. Additionally, many vaccine-preventable diseases have both a scientific name and a common name (e.g., 'varicella' and 'chicken pox'), and selection of which terminology to use may also influence vaccine uptake (Cummings & Kong, 2019). In applied vaccine promotion such lexical choices are rarely given attention, yet a critical reading of the rhetoric of vaccination can reveal an actor's explicit or implicit agendas and unspoken values (e.g., using scientific terms for familiar illnesses to make them sound more serious, or vice versa).

Vaccines may protect against viruses or bacteria, and may contain weakened versions of a germ ('live' vaccines), killed ('inactivated') versions of a germ, small pieces of a germ, or toxins produced by a germ to teach the immune system to recognize and mount a defence against subsequent infection (U.S.

National Library of Medicine, 2019). Risks and benefits can vary, making blanket communication of risks and benefits of vaccination challenging. In addition to the preventive interventions usually referred to by the term vaccines, there now exist targeted 'therapeutic vaccines', which provoke immune responses in efforts to combat a disease or infection the recipient already has (e.g., cancerous tumor, HIV infection), and are not deployed on a whole-population basis (Sela & Hilleman, 2004). The scientific complexity and sometimes-imprecise use of terminology around vaccination may contribute to lack of clear and convincing communication about the risks and benefits of vaccines.

Despite these challenges, vaccines are considered one of the great successes of modern medicine. Two diseases (smallpox in humans and the rinderpest cattle virus) have been eradicated due to vaccination, a third (polio) appears close to elimination, and mortality (death) and morbidity (illness or disability) due to dozens of other diseases have been greatly reduced (Greenwood, 2014). However, structural barriers (e.g., war, poverty, natural disaster) and doubts and concerns about vaccine safety and effectiveness contribute to the failure of vaccination campaigns to reach full potential (World Health Organization, 2019). While communication has a role to play in terms of improving surveillance systems and organizing health services, most vaccine communication research and practice focuses on the issue of persuasive communication to overcome vaccine hesitancy.

### Vaccine Attitudes

Vaccine hesitancy, defined as, "delay in acceptance or refusal of vaccination despite availability of vaccination services" (MacDonald & SAGE Working Group on Vaccine Hesitancy, 2015, p. 4161) is a key issue of our time, and contributes to undervaccination even in areas with high vaccine access.

Hesitancy is a concept that has been defined in multiple ways. For example, some definitions of hesitancy include anti-vaccine attitudes under a larger 'hesitancy' umbrella (MacDonald & SAGE Working Group on Vaccine Hesitancy, 2015), while others distinguish between hesitation and outright

rejection (e.g., Smith, 2017), or outline a variety of attitudinal stances along a spectrum from unquestioning acceptors to complete refusers (e.g., Leask et al., 2012). In some schemas, vaccine confidence is positioned as the opposite of hesitancy, whereas in others confidence—or lack thereof—is one of the contributors to hesitancy.

As with language used for vaccines themselves, the language we use to describe and discuss vaccine attitudes may carry connotations that lead to greater polarization and undermine efforts to improve public understanding about the benefits of vaccines. For example, when vaccine rejectors—or anyone other than unquestioning acceptors—are labelled as ‘antivaxxers’, new groups and identities may be negotiated, and barriers to communication across identity groups may be clarified or entrenched. Some who reject vaccines, or encourage others to do so, embrace the ‘antivax’ label with its connotations of resistance and ‘free thinking’, while others assert that they are taking stances that are ‘vaccine sceptical’ or ‘pro-vaccine safety’, invoking more scientific or technical labels for what are often positions taken in opposition to scientific consensus.

While it is important not to overattribute vaccine coverage challenges to hesitancy alone—doing so risks neglecting real structural barriers<sup>1</sup> that persist even in affluent and high-access settings—understanding and addressing vaccine hesitancy is a challenge many have been tackling in recent years (European Centre for Disease Prevention and Control, 2017; Jarrett et al., 2015). Efforts target various potential ‘sticking points’ in vaccine delivery including clinician-patient interactions, community attitudes, and accessibility of health services. A large portion of these interventions have relied on communication research and practical communication strategies.

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<sup>1</sup> Structural barriers are obstacles that disproportionately affect some groups within society, for example: lack of parental leave time for child medical appointments, lack of transportation or long travel time to medical care, long waits for vaccination appointments, co-payments or fees for vaccinations, health systems that are difficult to navigate, and biased healthcare providers who discourage care-seeking.

## **Vaccine Communication Research**

Vaccine communication is a multifaceted, interdisciplinary, and context-sensitive topic drawing on a variety of methods and conceptual approaches. Due to the multiple audiences for the knowledge generated by studies of vaccine communication, research on this topic is published across disciplinary boundaries, spanning clinician-oriented medical journals, public health, information and communication studies, sociology and anthropology, and other disciplines and fields. While research on vaccine communication is carried out from a variety of disciplinary perspectives, approaches from communication and media studies provide valuable insight into how professionals and laypeople communicate about vaccines, how vaccine-related messaging might be most effective with specific audiences and the importance of using communication in an ethically responsible manner. Even within communication studies, approaches draw on a variety of theories and methods, spanning a spectrum from highly-applied health communication approaches, which largely draw on quantitative and empiricist methods, to those rooted in cultural studies that employ qualitative or humanistic approaches.

Under the broad umbrella of communication and media studies, there is a range of approaches to the role of communication in vaccine confidence and hesitancy. Many messaging strategies tested in communication research regarding other topics in politics, health, or marketing may be tested scientifically for utility in vaccine communication. For example, for senior citizens, narrative approaches to vaccine communication have been found to be more effective in shifting attitudes and risk perceptions than didactic messaging (Prati et al., 2012). In another example, when attempting to correct false beliefs about vaccination, communication research suggests that the use of humour may lead to greater persuasive power of the correction (Moyer-Gusé et al., 2018). Message framing research on vaccine communication has had mixed results, likely reflecting differences in context and individual characteristics. Recent research has focused in on exploring the interplay between framing and factors

such as individual psychological and cultural attributes (e.g., Nan, 2012, which found different framings to be more effective with young adults with avoidance or approach orientations).

Cognitive information behaviours and assessment practices are also investigated in studies of communication and health. Confirmation bias (selective acceptance of messages that reinforce existing beliefs) has been found to play a substantial role in vaccine information assessment and may interact with other attributes such as health literacy. For example, Meppelink and colleagues (2019) found an association between higher rates of health literacy and stronger confirmation bias, particularly for messages that were pro-vaccine, suggesting interrelationships among underlying scientific knowledge, confirmation bias, and message acceptance. Related, audience assessments of information appear to be affected by a variety of factors including personal characteristics, narrative appeal, scientific credibility cues, and trust in source credibility (Haase et al., 2015).

Finally, research has explored and assessed the influence of health information systems on vaccination. For example, immunization information systems, including automated reminders and decision-support, now often delivered on mobile apps, may be useful tools for countering undervaccination (Gianfredi et al., 2019). Information-based health policies such as vaccine mandates, including requirements for school children to provide vaccination records and requirements that parents of unvaccinated children attend educational sessions, have been found to show highly context-dependent and mixed outcomes (Greyson, Vriesema-Magnuson, et al., 2019). The growing utility of big datasets for understanding and influencing vaccination, such as identifying internet search terms that are predictors of vaccine uptake (Kalichman & Kegler, 2015), is a newer way of drawing on information and communications studies to inform vaccine policy and practice.

#### Vaccine Communication by Healthcare Providers



Perhaps the most robust body of communication research on the topic of vaccination is that which proposes and tests various approaches to clinical (patient-provider) communication, with an aim of improving rates of vaccine uptake. However, this relatively large body of existing research has not resolved questions of ideal communication techniques, as the topic is complex, evolving, and highly contextual. The majority of this work focuses on how physicians can influence parents' decision-making regarding routine childhood vaccines, and thus tends to be published in medical journals with clinical or public health readerships. Studies in this vein may be exploratory, improving understanding of how providers and patients do or might best communicate, or confirmatory, testing frameworks or models that have been proposed to improve vaccine uptake. Exploratory work on this topic is often survey-based (Busse et al., 2011; Dubé et al., 2018) or grounded in qualitative interviews and ethnographic methods (Kaufman et al., 2019; Poltorak et al., 2005). Findings often lead to development of new approaches to vaccine promotion, which may then be tested via confirmatory research. Confirmatory clinical communication research often focuses on testing the effectiveness of vaccine communication tactics, methods, or approaches. For example a 'presumptive' approach ("today your child will be getting these vaccines") has been suggested as successful (in contrast with inviting questions) for the majority of parents, most of whom do not have major doubts, concerns, or anti-vaccine attitudes (Opel et al., 2013). Whereas presumptive communication methods may lead to higher overall rates of vaccine uptake, targeted (customized to a group) and tailored (customized to an individual) educational approaches (Schmid et al., 2008) may therefore be necessary for specific populations and individuals with low underlying trust.

The vast majority of vaccine communication research has taken place in affluent nations and regions, and the resulting evidence may not be applicable to populations and settings in low- and middle-income countries (Lewin et al., 2011). Even in affluent settings, different communication and rhetorical techniques may resonate with different subgroups. Wealthy mothers in western 'gated

community' settings, who are guided by ideologies that emphasize intensive management of 'unnatural' risks to their children (Reich, 2014), likely require different messages and messengers than Somali refugee and immigrant communities who were targeted by anti-vaccine activists taking advantage of parents' fears over high rates of autism diagnoses to promote a false link between vaccination and autism (Dyer, 2017). Communicating in a culturally sensitive manner, often by engaging community leaders as partners in vaccine communication, has proven effective in building vaccine acceptance. For example, a group of Orthodox Jewish nurses in New York formed the Engaging in Medical Education with Sensitivity (EMES, meaning "truth" in Hebrew) initiative, and used a variety of methods and media (e.g., print materials, living room conversations, women-only vaccine fairs, clinician training) to communicate evidence-based vaccine information and teach health literacy skills in their community, which was experiencing measles outbreaks exacerbated by alienation from the government and healthcare providers from outside the community (Marcus, 2020).

Clinician-patient communication also involves elements of setting such as timing, medium, and the nature of the patient-provider relationship within which communication about vaccines takes place. For example, communication aiming to influence new parents' vaccine decisions for their infants may be particularly effective if delivered by obstetric care providers during pregnancy and early postpartum (Kaufman et al., 2019), and daily reminders delivered via SMS/text messages may be able to reinforce such pro-vaccine messaging during pregnancy (Bushar et al., 2017). For those who provide care to a family over many years, such as family doctors and pediatricians, new research is exploring how to build longer term relationships of trust that may promote vaccine acceptance; for instance, providing tailored information to parents based on their position along the vaccine hesitancy spectrum may optimize outcomes by moving quickly to vaccinate those without doubts while allowing time to gently address questions of those who are hesitant (Leask et al., 2012).

## Media Studies and Vaccine Communication

A second large body of communication research on vaccines is in the area of media studies. News media efforts to 'balance' pro-vaccine and anti-vaccine perspectives have been explored and critiqued as problematic and potentially encouraging vaccine hesitancy. Whereas many journalists have positioned pro- and anti-vaccine voices as presenting 'competing views' worthy of equal attention, vaccine communication researchers argue that balance should focus on the weight of scientific evidence, and that not all views carry the same credibility or weight (Clarke et al., 2015). News coverage of vaccination and vaccine-preventable disease outbreaks have been the subject of studies exploring risk construction and communication, as well as communication of other values such as moral culpability. For example, Meyer and colleagues' (2016) analysis of newspaper coverage of influenza vaccines found frequency of risk messaging in newspapers to be positively associated with vaccination rates that year. Capurro and colleagues' (2018) qualitative analysis of the moral framing of vaccines and parents opposed to vaccination in news media coverage of the 2014-15 'Disneyland outbreak' of measles found that blame was focused on vaccine-refusing parents through the discursive construction of 'anti-vaxxers' to the extent that it risked stoking moral panic regarding vaccine hesitancy.

Websites have also been the subject of content and discourse analyses. For example, Grant and colleagues' (2015) study found that websites featuring vaccine skeptical viewpoints were better networked and leveraged the affordances of social media to a much greater extent than pro-vaccine sites. Website influence on vaccine attitudes has been explored experimentally, as in Betsch et al.'s (2010) research that manipulated website content viewed by study participants, resulting in increased perception of risks of vaccination after viewing vaccine-critical websites. As the web has become more 'social' and deeply networked, investigations have increasingly explored the potential for social media to affect vaccine debates (Witteman & Zikmund-Fisher, 2012). Kata (2012) characterized forms of rhetoric common in anti-vaccine social media, but these tactics and tropes may evolve over time and must be

revisited periodically. New social media platforms with different affordances and participant populations may shape online vaccine communication, as may changes in world events such as the COVID-19 pandemic, which was accompanied by an 'infodemic' of misinformation (World Health Organization, 2020) that spread rapidly online and converged with anti-vaccine conspiracy networks. Finally, given previous findings about the influence of social networks on vaccine attitudes, intervention studies have begun to test the potential for social media communication campaigns to promote vaccine acceptance, although such experiments have thus far had mixed results (Daley et al., 2018; Nyhan et al., 2014).

### Risk Communication

The issue of risk communication is a thread running through both interpersonal communication and media research on the topic of vaccination. Risk communication is key to many public health issues, as well as other topics, including the environment (Muralikrishna & Manickam, 2017; United States Environmental Protection Agency, 2015), organizational management (Wiedemann et al., 2011), government communication (National Research Council (US) Committee on Risk Perception and Communication, 1989), and crisis response (Reynolds & Seeger, 2005; Sandman, 2006). Risk communication research encompasses studies of how people and mass media communicate about risks, as well as influences on audience risk perceptions and use of risk information (Ruhrmann & Guenther, 2017). Key issues in risk communication include the social construction and valuation of risk in a given cultural context (Lupton, 2014), the gap between expert and layperson understandings of risks (Gutteling & Kuttschreuter, 2002; Lazo et al., 2000), and how to communicate in ways that warn the public about serious dangers without causing excessive concern over small hazards (Sandman, 2006).

Risk communication approaches to vaccination draw on multiple disciplinary traditions. Social scientific approaches often examine existing risk communication problems to understand social and structural factors that shape behaviour. Examples of this might be Petts and Niemeyer's (2004) UK

investigation of strategies parents use to make sense of risks related to the MMR vaccine or Berezin and Eads' (2016) analysis of vaccine risk narratives in U.S. news and trends in non-vaccination. An example of a health education approach would be exploring the way the mental models about vaccination held by the public shape risk communication needs. Newman and colleagues' (2009) used this approach in a mixed-method study, finding that risk communication for a potential HIV vaccine would need to counter fears of vaccine-induced infection and of adverse effects of immunization, as well as temper unrealistic expectations of a vaccine as 'magic bullet'. Public health approaches have ranged from ethical analysis, such as Nihlén Fahlquist's (2018) study of Swedish H1N1 policy around communication of rare adverse effects of the pandemic vaccine, to social media analyses of 'weaponized' vaccine risk messaging (Broniatowski et al., 2018), to clinical trials of the effectiveness of various forms of risk messaging on vaccine attitudes and uptake (Fadda et al., 2017; Kasting et al., 2019). Much work in vaccine risk communication spans disciplines, or brings together multidisciplinary teams, for example combining communication and public health, as in Greenberg and colleagues' (2017) Canadian national survey of parents about vaccine risk beliefs, or politics and pediatrics, such as Nyhan and colleagues' (2014) study of the effectiveness of various web-based MMR vaccine risk messages. Even if not working directly on risk communication, communication researchers studying vaccination should be aware of the rich and multidisciplinary risk communication literature that underpins a great deal of vaccine communication.

### **Ethical Frameworks for Vaccine Communication**

Any scholar or practitioner working in vaccine communication should be aware of the great deal of ethical deliberation that has gone into vaccination policy and practice. However, much less exploration has taken place regarding the ethics of the information systems, communication of vaccine science, and vaccine promotion. Much of the ethical consideration about vaccination to date has weighed individual autonomy (to decide whether to vaccinate) against the population benefit of

achieving high vaccination levels (Dawson, 2011). While cultural norms necessarily influence such discussions, these debates largely come out in favour of the good of the population, especially in cases of active outbreaks (Giubilini et al., 2018). As public health ethics has increasingly drawn on social science perspectives, ethical guidance regarding vaccine promotion interventions—including those using communication and information—has become more nuanced.

Currently, public health ethics and information ethics are beginning to intersect (Greyson, Knight, et al., 2019) in ways that can and should inform scholarly inquiry and intervention research on topics such as vaccine surveillance and communicative efforts to build vaccine confidence. Of key importance is the critical perspective that information and communication scholars bring to the topic of surveillance, including the ways surveillance systems and communication efforts can replicate and extend systemic biases such as racism when efforts target already-marginalized communities or when systems and programs are built on assumptions that are culturally biased.

### Information and Communication Ethics

Information ethics, rooted in library and information science (Hauptman, 1988), has focused on issues including censorship and intellectual freedom, intellectual property rights, public access to information, privacy and security, and digital governance (Burgess et al., 2019; Moore, 2005). The concerns of information ethicists are highly germane to vaccine communication. These concerns include access to medical research and issues of medical privacy, including development of a “surveillance society” (Lyon, 1994) in which everyday surveillance is normalized and serves to entrench existing social hierarchies. Examples of normalized surveillance causing public health problems include predictive policing algorithms that have been found to intensify levels of over-policing and police violence against Black individuals and communities (Heaven, 2020) and breaches in the confidentiality of personal health data leading to stigma and inequities (Lyerla & Stroup, 2018). Communication ethics hasn’t developed a

unique body of literature distinct from information ethics as a whole, and formal statements of communication ethics tend to affirm the importance of transparency, truthfulness, freedom of expression, and other principles commonly included in information ethics (see, for example, National Communication Association, 2017).

### Public Health Communication Ethics

Public health ethics has expanded upon the focus of traditional western biomedical ethics on the principles of autonomy, beneficence, non-maleficence, and justice in clinical practice (Beauchamp & Childress, 2013), by also considering issues of individual and population welfare, interventions launched for the good of the public, and multi-agency efforts to intervene in social and structural causes of health or illness (Dawson & Verweij, 2008; Holland, 2007). A subset of public health interventions use information, either in the form of communications, surveillance, or bidirectional programs that combine communication and surveillance together, and these information interventions carry their own risks and complexities that should not be dismissed (Greyson, Knight, et al., 2019).

A small body of research and theory has emerged focused on the ethics of public health communication, and in particular unintended consequences of health communication efforts. Guttman (1997), for example, identified ethical concerns within health communication campaigns, including issues of misleading content, coercive messaging, targeted messages serving to stigmatize groups, and dilemmas related to harm reduction approaches. Efforts to discourage unhealthy behaviours also run the risk of stigmatizing those who are already-ill or creating the impression that certain groups are destined to be unhealthy (see, for example, Frohlich et al., 2012 on the war on smoking's creation of the socially marginalized youth smoker). Additionally, health promotion messages might raise ethical concerns when they reinforce stereotypes as part of an effort to reach members of traditional cultural communities, or objectify women in an effort to attract attention to women's health (Guttman &

Salmon, 2004). While advertising techniques are commonly applied in public health messaging, and may in fact produce positive population health outcomes (e.g., reduction in risky behaviours), ethical considerations arise when such persuasive messaging overrides fully informed consent, acting too strongly to 'sell' a particular behavior or intervention without adequate disclosure of full risk and benefit information.

In contrast to critical perspectives on surveillance, which are common in communication and media studies, surveillance has been relied upon as the 'cornerstone' of public health (Lee & Thacker, 2011). Collection and analysis of epidemiological data is key to monitoring outbreaks of disease as well as identifying risk factors for individuals and communities, and public health has made inroads into harnessing the power of geospatial mapping and 'big' data such as real-time internet search metrics to identify, predict, and address health threats. However, prominent voices in public health ethics have also raised concerns over risks of surveillance, particularly when it contains personally-identifiable data or addresses stigmatized health conditions such as HIV (Fairchild & Bayer, 2011). Similarly, data sharing between, for example, public health and law enforcement, raises ethical concerns even if it carries the potential to improve health or curtail outbreaks, and targeted surveillance of particular groups (e.g., Indigenous communities, poor neighbourhoods) may serve to compound stigma and marginalization (Fairchild & Bayer, 2004).

#### Ethical Considerations for Vaccine Communication

Vaccine communication research and practice may be viewed through lenses of both information and communication ethics, and public health ethics. Particularly when considering interventions that involve surveillance, the incorporation of both ethical traditions enables consideration of the potential value of granular data *and* the risks for privacy and stigmatization that may accompany population surveillance. As new digital technologies are increasingly drawn upon in



vaccine communication, for example, through mobile vaccine reminder and record-keeping apps, such concerns may grow.

High quality communication can minimize ethical risks regarding vaccination by presenting information in ways appropriate for a given audience, and by partnering with trusted community leaders to deliver evidence-based messages and to conduct surveillance of vaccine coverage in culturally acceptable ways. However, skilled communication techniques may also be used in unethical ways such as by leveraging existing online trust networks to perpetuate disinformation about vaccine safety. Additionally, low-quality communication (e.g., without reference to sources, or using misleading ‘scare’ statistics and graphs with inappropriately truncated axes) can serve as fuel for anti-vaccine campaigns, even if intended to encourage better population health outcomes.

One example of poor risk communication that can be experienced by the public as manipulative is the risk of Guillain-Barré Syndrome (GBS) following influenza vaccination. GBS is a rare syndrome that causes nerve damage and paralysis, often following an infection. A slightly heightened risk of GBS has been associated with receipt of some years’ influenza vaccines, although that risk is much smaller than the risk following influenza disease (Centers for Disease Control and Prevention, 2020). Statistics such as “one GBS admissions per million vaccinations compared with 17 GBS admissions per million influenza infections” (The Children’s Hospital of Philadelphia, 2018, para. 1) are commonly used in efforts to persuade individuals to receive the influenza vaccine, without factoring in how likely a person is to experience influenza disease in a given year. While the math would still come out in favor of vaccination, both on individual and population levels, presenting these statistics as comparable when they do not have common denominators can erode trust and reinforce hesitancy. When public health and clinical communication fail to fill gaps in public understanding (such as how likely one is to experience GBS in a given year with versus without influenza vaccination), this provides opportunities for disinformation peddlers to scare and misinform people.

Even commonly accepted terminology, such as ‘vaccine preventable disease’ or ‘vaccine hesitancy’ can carry and convey multiple meanings and be invoked and interpreted in accordance with multiple, sometimes competing discourses. For example, to someone unconvinced about a given vaccine because it is only 88% effective, calling the disease ‘vaccine preventable’ may sound disingenuous, as the vaccine does not guarantee prevention to the individual receiving the vaccine. Public health understanding is focused on the whole population, however, and if the entire population is vaccinated at a high level, that 88% effectiveness is considered sufficient to prevent disease outbreaks—in other words, if one case is introduced from elsewhere, it would be prevented from spreading throughout the community.

While these examples are common in vaccine promotion, a trained communication professional who has studied the ways communication and discourses shape hesitancy about vaccination is well-equipped to identify them from a perspective unique to that of most health professionals. Further, a scholar of communication ethics will be prepared to help those working in public health act in ways that are neither manipulative, stigmatizing, nor needlessly invasive, ultimately improving public trust in vaccine communication from authoritative scientific sources.

## **Conclusion**

Vaccine communication is a scientifically complex, multidisciplinary, and ethically laden area in which to conduct research or practice. The language used to communicate about vaccination contain key information about the values, beliefs, and mental models held by individuals, organizations, and populations, and hold the potential to improve health globally. Vaccine communication also has important ethical dimensions, and both academic and professional discourse about vaccination increasingly demands that we align information ethics and public health ethics approaches, in order to improve vaccine communication knowledge and practice.

Similar to many health communication topics, vaccination is both technically challenging and culturally sensitive. While vaccination is a core strategy for the health of populations, best practices for communication about vaccines remain a work in progress. Given the context-dependence of both infectious disease and health decision-making, vaccine communication is a topic for which interdisciplinary collaboration and academic cross-pollination is imperative. Drawing on both sound vaccine science and communication studies perspectives on effective message framing, audience reception, context-specific values around risk perception, and interpersonal communication dynamics provides the most promise for improving the vaccine communication landscape today.

## References

- Beauchamp, T. L., & Childress, J. F. (2013). *Principles of biomedical ethics* (7th ed). Oxford University Press.
- Berezin, M., & Eads, A. (2016). Risk is for the rich? Childhood vaccination resistance and a Culture of Health. *Social Science & Medicine*, *165*, 233–245.  
<https://doi.org/10.1016/j.socscimed.2016.07.009>
- Betsch, C., Renkewitz, F., Betsch, T., & Ulshöfer, C. (2010). The influence of vaccine-critical websites on perceiving vaccination risks. *Journal of Health Psychology*, *15*(3), 446–455.  
<https://doi.org/10.1177/1359105309353647>
- Broniatowski, D. A., Jamison, A. M., Qi, S., AlKulaib, L., Chen, T., Benton, A., Quinn, S. C., & Dredze, M. (2018). Weaponized health communication: Twitter bots and Russian trolls amplify the vaccine debate. *American Journal of Public Health*, *108*(10), 1378–1384.  
<https://doi.org/10.2105/AJPH.2018.304567>
- Burgess, J. T. F., Knox, E., & Hauptman, R. (2019). *Foundations of information ethics*. ALA Neal-Schuman.
- Bushar, J. A., Kendrick, J. S., Ding, H., Black, C. L., & Greby, S. M. (2017). Text4baby influenza messaging and influenza vaccination among pregnant women. *American Journal of Preventive Medicine*, *53*(6), 845–853. <https://doi.org/10.1016/j.amepre.2017.06.021>
- Busse, J. W., Walji, R., & Wilson, K. (2011). Parents' experiences discussing pediatric vaccination with healthcare providers: A survey of Canadian naturopathic patients. *PLoS One*, *6*(8), e22737.  
<https://doi.org/10.1371/journal.pone.0022737>
- Capurro, G., Greenberg, J., Dubé, E., & Driedger, M. (2018). Measles, moral regulation and the social construction of risk: Media narratives of “Anti-Vaxxers” and the 2015 Disneyland outbreak. *Canadian Journal of Sociology*, *43*(1), 25–48. <https://doi.org/10.29173/cjs29301>

- Centers for Disease Control and Prevention. (2020, August 14). *GBS (Guillain-Barré Syndrome) and Vaccines*. Vaccine Safety, Questions and Concerns. Retrieved on November 30, 2020, from <https://www.cdc.gov/vaccinesafety/concerns/guillain-barre-syndrome.html>
- Clarke, C. E., Dixon, G. N., Holton, A., & McKeever, B. W. (2015). Including “evidentiary balance” in news media coverage of vaccine risk. *Health Communication, 30*(5), 461–472.  
<https://doi.org/10.1080/10410236.2013.867006>
- Cummings, C. L., & Kong, W. Y. (2019). “Influenza” versus “flu”: Do different medical terms affect vaccination intention? *Journal of Health Communication, 24*(4), 456–460.  
<https://doi.org/10.1080/10810730.2019.1630527>
- Daley, M. F., Narwaney, K. J., Shoup, J. A., Wagner, N. M., & Glanz, J. M. (2018). Addressing parents’ vaccine concerns: A randomized trial of a social media intervention. *American Journal of Preventive Medicine, 55*(1), 44–54. <https://doi.org/10.1016/j.amepre.2018.04.010>
- Dawson, A. (Ed.). (2011). *Public health ethics: Key concepts and issues in policy and practice*. Cambridge University Press.
- Dawson, A., & Verweij, M. (2008). Public health ethics: A manifesto. *Public Health Ethics, 1*(1), 1–2.  
<https://doi.org/10.1093/phe/phn009>
- Dubé, E., Gagnon, D., Kaminsky, K., Green, C. R., Ouakki, M., Bettinger, J. A., Brousseau, N., Castillo, E., Crowcroft, N. S., Driedger, S. M., Greyson, D., Fell, D., Fisher, W., Gagneur, A., Guay, M., Halperin, D., Halperin, S. A., MacDonald, S., Meyer, S. B., ... Cook, J. L. (2018). Vaccination against influenza in pregnancy: A survey of Canadian maternity care providers. *Journal of Obstetrics and Gynaecology Canada. https://doi.org/10.1016/j.jogc.2018.09.007*
- Dyer, O. (2017). Measles outbreak in Somali American community follows anti-vaccine talks. *BMJ, 357*.  
<https://doi.org/10.1136/bmj.j2378>

- European Centre for Disease Prevention and Control. (2017). *Catalogue of interventions addressing vaccine hesitancy*. ECDC. <http://dx.publications.europa.eu/10.2900/654210>
- Fadda, M., Galimberti, E., Fiordelli, M., Romanò, L., Zanetti, A., & Schulz, P. J. (2017). Effectiveness of a smartphone app to increase parents' knowledge and empowerment in the MMR vaccination decision: A randomized controlled trial. *Human Vaccines & Immunotherapeutics*, 13(11), 2512–2521. <https://doi.org/10.1080/21645515.2017.1360456>
- Fairchild, A. L., & Bayer, R. (2004). Ethics and the Conduct of Public Health Surveillance. *Science*, 303(5658), 631–632. <https://doi.org/10.1126/science.1094038>
- Fairchild, A. L., & Bayer, R. (2011). HIV surveillance, public health, and clinical medicine—will the walls come tumbling down? *New England Journal of Medicine*, 365(8), 685–687. <https://doi.org/10.1056/NEJMp1107294>
- Frohlich, K. L., Mykhalovskiy, E., Poland, B. D., Haines-Saah, R., & Johnson, J. (2012). Creating the socially marginalised youth smoker: The role of tobacco control. *Sociology of Health & Illness*, 34(7), 978–993. <https://doi.org/10.1111/j.1467-9566.2011.01449.x>
- Gianfredi, V., Moretti, M., & Lopalco, P. L. (2019). Countering vaccine hesitancy through immunization information systems, a narrative review. *Human Vaccines & Immunotherapeutics*, 15(11), 2508–2526. <https://doi.org/10.1080/21645515.2019.1599675>
- Giubilini, A., Douglas, T., & Savulescu, J. (2018). The moral obligation to be vaccinated: Utilitarianism, contractualism, and collective easy rescue. *Medicine, Health Care and Philosophy*, 21(4), 547–560. <https://doi.org/10.1007/s11019-018-9829-y>
- Grant, L., Hausman, B. L., Cashion, M., Lucchesi, N., Patel, K., & Roberts, J. (2015). Vaccination persuasion online: A qualitative study of two provaccine and two vaccine-skeptical websites. *Journal of Medical Internet Research*, 17(5), e133. <https://doi.org/10.2196/jmir.4153>

Greenberg, J., Dubé, E., & Driedger, M. (2017). Vaccine hesitancy: In search of the risk communication comfort zone. *PLoS Currents*, 9.

<https://doi.org/10.1371/currents.outbreaks.0561a011117a1d1f9596e24949e8690b>

Greenwood, B. (2014). The contribution of vaccination to global health: Past, present and future. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 369(1645).

<https://doi.org/10.1098/rstb.2013.0433>

Greyson, D., Knight, R., & Shoveller, J. A. (2019). Ethics, effectiveness and population health information interventions: A Canadian analysis. *Health Promotion International*, 34(3), 501–509.

<https://doi.org/10.1093/heapro/day004>

Greyson, D., Vriesema-Magnuson, C., & Bettinger, J. A. (2019). Impact of school vaccination mandates on pediatric vaccination coverage: A systematic review. *CMAJ Open*, 7(3), E524–E536.

<https://doi.org/10.9778/cmajo.20180191>

Gutteling, J. M., & Kuttschreuter, M. (2002). The role of expertise in risk communication: Laypeople's and expert's perception of the millennium bug risk in The Netherlands. *Journal of Risk Research*, 5(1), 35–47. <https://doi.org/10.1080/13669870010029639>

Guttman, N. (1997). Ethical dilemmas in health campaigns. *Health Communication*, 9(2), 155.

[https://doi.org/10.1207/s15327027hc0902\\_3](https://doi.org/10.1207/s15327027hc0902_3)

Guttman, N., & Salmon, C. T. (2004). Guilt, fear, stigma and knowledge gaps: Ethical issues in public health communication interventions. *Bioethics*, 18(6), 531–552.

<https://doi.org/10.1111/j.1467-8519.2004.00415.x>

Haase, N., Betsch, C., & Renkewitz, F. (2015). Source credibility and the biasing effect of narrative information on the perception of vaccination risks. *Journal of Health Communication*, 20(8), 920–929. <https://doi.org/10.1080/10810730.2015.1018605>

Hauptman, R. (1988). *Ethical challenges in librarianship*. Oryx Press.

Healthdirect Australia. (2019, June 7). *Immunisation or vaccination—What’s the difference?* [Text/html].

Healthdirect Australia. <https://www.healthdirect.gov.au/immunisation-or-vaccination-whats-the-difference>

Heaven, W. D. (2020). Predictive policing algorithms are racist. They need to be dismantled. *MIT*

*Technology Review*. <https://www.technologyreview.com/2020/07/17/1005396/predictive-policing-algorithms-racist-dismantled-machine-learning-bias-criminal-justice/>

Holland, S. (2007). *Public health ethics*. Polity.

Jarrett, C., Wilson, R., O’Leary, M., Eckersberger, E., & Larson, H. J. (2015). Strategies for addressing vaccine hesitancy – A systematic review. *Vaccine*, 33(34), 4180–4190.

<https://doi.org/10.1016/j.vaccine.2015.04.040>

Kalichman, S. C., & Kegler, C. (2015). Vaccine-related internet search activity predicts H1N1 and HPV vaccine coverage: Implications for vaccine acceptance. *Journal of Health Communication*, 20(3), 259–265. <https://doi.org/10.1080/10810730.2013.852274>

Kasting, M. L., Head, K. J., Cox, D., Cox, A. D., & Zimet, G. D. (2019). The effects of message framing and healthcare provider recommendation on adult hepatitis B vaccination: A randomized controlled trial. *Preventive Medicine*, 127, 105798. <https://doi.org/10.1016/j.ypmed.2019.105798>

Kata, A. (2012). Anti-vaccine activists, Web 2.0, and the postmodern paradigm – An overview of tactics and tropes used online by the anti-vaccination movement. *Vaccine*, 30(25), 3778–3789.

<https://doi.org/10.1016/j.vaccine.2011.11.112>

Kaufman, J., Attwell, K., Hauck, Y., Omer, S. B., & Danchin, M. (2019). Vaccine discussions in pregnancy: Interviews with midwives to inform design of an intervention to promote uptake of maternal and childhood vaccines. *Human Vaccines & Immunotherapeutics*, 15(11), 2534–2543.

<https://doi.org/10.1080/21645515.2019.1607131>



- Lazo, J. K., Kinnell, J. C., & Fisher, A. (2000). Expert and layperson perceptions of ecosystem risk. *Risk Analysis*, 20(2), 179–194. <https://doi.org/10.1111/0272-4332.202019>
- Leask, J., Kinnersley, P., Jackson, C., Cheater, F., Bedford, H., & Rowles, G. (2012). Communicating with parents about vaccination: A framework for health professionals. *BMC Pediatrics*, 12(1), 154. <https://doi.org/10.1186/1471-2431-12-154>
- Lee, L. M., & Thacker, S. B. (2011). The cornerstone of public health practice: Public health surveillance, 1961–2011. *Morbidity and Mortality Weekly Report*, 60(4), 15–21.
- Lewin, S., Hill, S., Abdullahi, L. H., de Castro Freire, S. B., Bosch-Capblanch, X., Glenton, C., Hussey, G. D., Jones, C. M., Kaufman, J., Lin, V., Mahomed, H., Rhoda, L., Robinson, P., Waggie, Z., Willis, N., & Wiysonge, C. S. (2011). “Communicate to vaccinate” (COMMVAC). building evidence for improving communication about childhood vaccinations in low- and middle-income countries: Protocol for a programme of research. *Implementation Science: IS*, 6, 125. <https://doi.org/10.1186/1748-5908-6-125>
- Lupton, D. (2014). *Risk* (2nd ed). Routledge.
- Lyerla, R., & Stroup, D. F. (2018). Toward a public health surveillance system for behavioral health. *Public Health Reports*, 133(4), 360–365. <https://doi.org/10.1177/0033354918772547>
- Lyon, D. (1994). *The electronic eye: The rise of surveillance society: Computers and social control in context*. Polity Press.
- MacDonald, N. E., & SAGE Working Group on Vaccine Hesitancy. (2015). Vaccine hesitancy: Definition, scope and determinants. *Vaccine*, 33(34), 4161–4164. <https://doi.org/10.1016/j.vaccine.2015.04.036>
- Marcus, B. (2020). A nursing approach to the largest measles outbreak in recent U.S. history: Lessons learned battling homegrown vaccine hesitancy. *Online Journal of Issues in Nursing*, 25(1). <https://doi.org/10.3912/OJIN.Vol25No01Man03>

- Meppelink, C. S., Smit, E. G., Fransen, M. L., & Diviani, N. (2019). "I was right about vaccination": Confirmation bias and health literacy in online health information seeking. *Journal of Health Communication, 24*(2), 129–140. <https://doi.org/10.1080/10810730.2019.1583701>
- Meyer, S. B., Lu, S. K., Hoffman-Goetz, L., Smale, B., MacDougall, H., & Pearce, A. R. (2016). A content analysis of newspaper coverage of the seasonal flu vaccine in Ontario, Canada, October 2001 to March 2011. *Journal of Health Communication, 21*(10), 1088–1097. <https://doi.org/10.1080/10810730.2016.1222038>
- Moore, A. D. (2005). *Information ethics: Privacy, property, and power*. University of Washington Press.
- Moyer-Gusé, E., Robinson, M. J., & Mcknight, J. (2018). The role of humor in messaging about the MMR vaccine. *Journal of Health Communication, 23*(6), 514–522. <https://doi.org/10.1080/10810730.2018.1473533>
- Muralikrishna, I. V., & Manickam, V. (2017). Environmental risk assessment. In I. V. Muralikrishna & V. Manickam (Eds.), *Environmental management* (pp. 135–152). Butterworth-Heinemann. <https://doi.org/10.1016/B978-0-12-811989-1.00008-7>
- Nan, X. (2012). Communicating to young adults about HPV vaccination: Consideration of message framing, motivation, and gender. *Health Communication, 27*(1), 10–18. <https://doi.org/10.1080/10410236.2011.567447>
- National Communication Association. (2017). *Credo for Ethical Communication*. Retrieved on November 30, 2020, from [https://www.natcom.org/sites/default/files/Public Statement Credo for Ethical Communication 2017.pdf](https://www.natcom.org/sites/default/files/Public%20Statement%20Credo%20for%20Ethical%20Communication%202017.pdf)
- National Research Council (US) Committee on Risk Perception and Communication. (1989). *Improving risk communication*. National Academies Press (US). <http://www.ncbi.nlm.nih.gov/books/NBK218585/>

- Newman, P. A., Seiden, D. S., Roberts, K. J., Kakinami, L., & Duan, N. (2009). A small dose of HIV? HIV vaccine mental models and risk communication. *Health Education & Behavior, 36*(2), 321–333.  
<https://doi.org/10.1177/1090198107305078>
- Nihlén Fahlquist, J. (2018). Vaccine hesitancy and trust. Ethical aspects of risk communication. *Scandinavian Journal of Public Health, 46*(2), 182–188.  
<https://doi.org/10.1177/1403494817727162>
- Nyhan, B., Reifler, J., Richey, S., & Freed, G. L. (2014). Effective messages in vaccine promotion: A randomized trial. *Pediatrics, 133*(4), 2013–2365. <https://doi.org/10.1542/peds.2013-2365>
- Opel, D. J., Heritage, J., Taylor, J. A., Mangione-Smith, R., Salas, H. S., DeVere, V., Zhou, C., & Robinson, J. D. (2013). The architecture of provider-parent vaccine discussions at health supervision visits. *Pediatrics, peds.2013-2037*. <https://doi.org/10.1542/peds.2013-2037>
- Oxford Vaccines Group. (2019, January 3). *What is a vaccine, and how do vaccines work?* Vaccine Knowledge. <https://vk.ovg.ox.ac.uk/vk/how-do-vaccines-work>
- Poltorak, M., Leach, M., Fairhead, J., & Cassell, J. (2005). ‘MMR talk’ and vaccination choices: An ethnographic study in Brighton. *Social Science & Medicine, 61*(3), 709–719.  
<https://doi.org/10.1016/j.socscimed.2004.12.014>
- Prati, G., Pietrantonio, L., & Zani, B. (2012). Influenza vaccination: The persuasiveness of messages among people aged 65 years and older. *Health Communication, 27*(5), 413–420.  
<https://doi.org/10.1080/10410236.2011.606523>
- Petts, J. P., & Niemeyer, S. (2004). Health risk communication and amplification: Learning from the MMR vaccination controversy. *Health, Risk & Society, 6*(1), 7–23.  
<https://doi.org/10.1080/13698570410001678284>

- Reich, J. A. (2014). Neoliberal mothering and vaccine refusal imagined gated communities and the privilege of choice. *Gender & Society*, 28(5), 679–704.  
<https://doi.org/10.1177/0891243214532711>
- Reynolds, B., & Seeger, M. W. (2005). Crisis and emergency risk communication as an integrative model. *Journal of Health Communication*, 10(1), 43–55. <https://doi.org/10.1080/10810730590904571>
- Ruhrmann, G., & Guenther, L. (2017). Risk communication. *Oxford Bibliographies of Communication*.  
<https://doi.org/10.1093/OBO/9780199756841-0156>
- Sandman, P. M. (2006). Crisis communication best practices: Some quibbles and additions. *Journal of Applied Communication Research*, 34(3), 257–262.  
<https://doi.org/10.1080/00909880600771619>
- Schmid, K. L., Rivers, S. E., Latimer, A. E., & Salovey, P. (2008). Targeting or tailoring? Maximizing resources to create effective health communications. *Marketing Health Services*, 28(1), 32–37.
- Sela, M., & Hilleman, M. R. (2004). Therapeutic vaccines: Realities of today and hopes for tomorrow. *Proceedings of the National Academy of Sciences of the United States of America*, 101(Suppl 2), 14559. <https://doi.org/10.1073/pnas.0405924101>
- Smith, T. C. (2017). Vaccine rejection and hesitancy: A review and call to action. *Open Forum Infectious Diseases*, 4(3). <https://doi.org/10.1093/ofid/ofx146>
- The Children’s Hospital of Philadelphia. (2018, September 17). *Vaccines and Guillain-Barré Syndrome* [Text]. Children’s Hospital of Philadelphia Vaccine Education Center; The Children’s Hospital of Philadelphia. <https://www.chop.edu/centers-programs/vaccine-education-center/vaccines-and-other-conditions/guillain-barre-syndrome>
- United States Environmental Protection Agency. (2015, August 20). *Risk communication* [Data and Tools]. US EPA. <https://www.epa.gov/risk/risk-communication>

U.S. National Library of Medicine. (2019). *Vaccines (immunizations)—overview*. MedlinePlus Medical Encyclopedia. <https://medlineplus.gov/ency/article/002024.htm>

Wiedemann, P. M., Clauberg, M., & Gray, P. C. R. (2011). *Risk communication for companies* (p. 94) [Guidebook]. Fischer Verlag.

Witteman, H. O., & Zikmund-Fisher, B. J. (2012). The defining characteristics of Web 2.0 and their potential influence in the online vaccination debate. *Vaccine, 30*(25), 3734–3740.

<https://doi.org/10.1016/j.vaccine.2011.12.039>

World Health Organization. (2019). *Ten threats to global health in 2019*. WHO.

<https://www.who.int/emergencies/ten-threats-to-global-health-in-2019>

World Health Organization. (2020, August 25). *Immunizing the public against misinformation*. World Health Organization. [https://www.who.int/news-room/feature-stories/detail/immunizing-](https://www.who.int/news-room/feature-stories/detail/immunizing-the-public-against-misinformation)

[the-public-against-misinformation](https://www.who.int/news-room/feature-stories/detail/immunizing-the-public-against-misinformation)