



# Promoting immunization resiliency in the digital information age

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## Abstract

The avalanche of online information on immunization is having a major impact on the percentage of the population who choose to get vaccinated. Vaccine misinformation spreads widely with the interactive Web 2.0 and social media; this can bury science-based information. A plethora of immunization misinformation online is affecting trust in health care professionals and in public immunization programs. There are no simple solutions to this, but seven evidence-based strategies can help. First, listen to patients' and parents' concerns, and demonstrate responsiveness by adopting best immunization practices, such as pain mitigation. Second, recognize and alert others to anti-immunization tactics, namely, conspiracy theories, fake experts, selectivity, demands that vaccines be 100% safe and effective, misrepresentation and false logic. Third, avoid unproductive debates with those who have strongly held views, both in person and when using social media. Be respectful, stick to your key message, identify where to find useful information and exit. Fourth, consider establishing an attractive, easily searchable online presence that reflects the complex art of persuasion. Emphasize the benefits of vaccine, use reader-friendly graphics and highlight facts with stories to strengthen your case. Fifth, work with social media platform providers, not to stifle freedom of expression, but to help ensure that misinformation is not favoured in searches. Sixth, promote curriculum development in the schools to improve students' understanding of the benefits and safety of immunization and to foster critical thinking skills. To do this, optimize the use of age-appropriate comics and interactive learning tools such as electronic games. Seventh, to shift the narrative in specific communities with low vaccination rates, work with community leaders to build tailored programs that foster trust and reflect local values.

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## Introduction

The decision by individuals and parents to accept a vaccine is influenced by many factors. These can vary with time, place, vaccine and context (1). In Canada, as in other countries around the globe, the online immunization information avalanche is having a major impact on uptake. In the early digital age, public health information available online was static “read only” materials; with Web 2.0, online information has evolved into multidirectional, user-generated communication characterized by participation, collaboration and openness. Web 2.0 and social media have become the major modern platform for self-directed learning—a bottom-up approach with users reaching out, rather than a top-down strategy with experts providing information.

Most Canadians seek health information online, including information on immunization. This includes many seniors even though they came of age long before Web 2.0 (2). Unfortunately, only some of the immunization information on Web 2.0 and

social media is science or evidence-based. Much online information is opinion or speculation as well as dramatic, often untrue but oft-repeated stories about adverse events presented as “alternative facts.” Such vaccine misinformation can spread widely on social media (3), burying science-based information. Exchanges may spread widely, and comments may be vigorous and may become increasingly polarized overtime (4).

Exposure to immunization misinformation and fake news is now very common. A 2018 study from the United Kingdom found that over 40% of parents had been exposed to negative vaccine messages on social media (5). This is not a trivial issue: it poses a risk of confirmation bias (6). Confirmation bias occurs when people seek, select and retain the information that confirms their existing beliefs; it results in a bias in how new information is evaluated. Furthermore, with social media platforms, people are now being exposed to messages that are critical of vaccines even



when they are not seeking this type of information. Negative vaccine information may elicit and/or reinforce vaccine hesitancy. It has been shown that as little as 5 to 10 minutes on an anti-vaccine website can negatively influence decisions to accept a vaccine (7).

A small percentage of people are profoundly anti-vaccine and refuse all vaccines (8). Some are very active online and have very firm opinions that evidence and facts are unlikely to shift. They may see themselves as experts, although this expertise is based upon misinformation gathered online from others holding similar world views. They are often only too willing to share their “knowledge” through YouTube videos, Twitter, Facebook groups and websites that readily pop up on Google searches. Such evergrowing misinformation can negatively influence vaccine decisions (9) and affect reporting of adverse events (10).

The digital information age has also changed the patient–health care professional relationship. Shared decision making is becoming normative and “top-down” paternalism is disappearing. This is not invariably negative; shared decision making is good when supported by sound scientific evidence that is shared and understood, but it is not good when decisions are influenced by misinformation. And the plethora of immunization misinformation online is not only influencing decision making; it is also affecting trust in health care professionals and in public immunization programs. Sadly, trolling for and subsequently online bullying of evidence-based vaccine experts by those with polarized opposite views, is an increasingly recognized problem (11,12).

To address these challenges, “immunization resiliency” needs to be promoted. Immunization resiliency in this context means ensuring that vaccination programs are adapted to the current digital communication environment in order to grow public trust in health care providers and optimize vaccine acceptance over time. The objective of this article is to identify best practices for front line vaccine providers in order to promote vaccine resiliency. This is the first of a series of articles, produced by The Canadian Vaccination Evidence Resource and Exchange Centre (CANVax), which include both the identification of existing resources and the creation of new resources by a group of multidisciplinary professionals (13).

## What can health care professionals do to promote immunization resiliency?

There are no simple solutions to addressing the avalanche of digital misinformation about vaccines and the deleterious effects this has caused, but evidence-based strategies can help. We highlight seven key strategies that are based on reviews of psychological research on persuasion, myth debunking, science denialism, communication science and research on impact of social media.

### 1. Listen to patients and parents

In this postpaternalism world, it is important to learn what the issues of concern are when interacting with people who are contemplating vaccination both at an individual and at a community level. At the clinical level, health care providers need to be prepared to listen and then address concerns as they arise. Using the mini-motivational interviewing tools can be effective in moving the patient towards vaccine acceptance (14). If pain on immunization is a concern—and it is for over 40% of mothers of infants needing immunization—then use best practices for mitigation pain based upon Canada’s 2015 guidelines (15).

Frontline health care providers need to be encouraged to report to their local public health unit common concerns they are hearing. Immunization programs can use these concerns as well as those found through analysis of social media to develop targeted communication messages using traditional and social media (16). There is a good rationale for directly countering social media misinformation because of its potential influence. Effective strategies to do this have been proposed (17). Remember: data tells but stories sell—be succinct and straightforward.

### 2. Recognize and alert others to anti-immunization tactics

Recognize the tactics often used by those opposing immunization: conspiracy theories, fake experts, selectivity, demands that vaccines be 100% safe and effective, misrepresentation and false logic (18). Correcting misinformation and highlighting these techniques being used can help inoculate against misinformation (19). Draw attention to these, especially in a forum where there is a bigger audience, for example, in a Facebook group, etc., and only if your message is not so polarized that it will be buried. Alerting to these tactics and correcting misinformation can be salutary for those without confirmed negative views on immunization (20). Remember your target is not the person promulgating the misinformation but the reader of the misinformation.

### 3. Avoid unproductive debates and be respectful

Be aware that many online anti-vaccine forums are very polarized; joining in may not be helpful (4). While the evidence is clear that vaccines are safe and effective and that diseases with serious consequences—even death—can occur when immunization is omitted, this will not convince those with strongly held opposing views. Do not fall into the persuasion loop trap. When your efforts to correct repeated examples of selectivity or misrepresentation are met with “yes, but,” this can lead to a never-ending dialogue. It is more effective to be respectful, stick to your message, identify where to find more information and exit the conversation, that is, limit direct engagement with those who have strong anti-vaccination views, either online or in person. Repeating their arguments as you attempt to refute them can be counterproductive as the misinformation may stick (21).



When you do engage in social media opportunities, do so wisely. Tailored and targeted messages and information can help shape attitudes and improve uptake (22,23). As noted above, it can be useful to alert others to anti-vaccination tactics in public forums (20,21). Get your point across succinctly—remember that stories are often more powerful than dry facts and numbers—and steer readers to reputable sites for more quality information.

Never be disparaging or demeaning in public or to a patient. The term “vaccine deniers” has been used as convenient shorthand, but a more neutral description, such as “those with strong anti-vaccine opinions,” may be better received during discussions.

#### **4. Consider developing an attractive, easily searchable online presence**

When health professionals and/or their organizations have a presence on the internet, presenting evidence-based information about immunization online can be helpful. However, avoid “knowledge dumps” or posting large quantities of very technical information to try and counter every new piece of misinformation. Be proactive: promote positive messages about vaccination in a succinct and easy-to-grasp manner.

If you plan to build a pro immunization website, make it appealing, easily searchable and as interactive as possible. Clearly identify your evidence-based key messages, with short reader-friendly text. The complex art of persuasion calls for a blend of different strategies, including the need for a straightforward presentation of the “what”, “how”, “where”, “when” and “who” complemented with stories. Colour and graphics also help to increase the impact of key points (24).

Static websites are dated. If resources permit, include a place where visitors can post questions. Having nowhere to make inquiries can be frustrating. If you do not have the resources for this, consider including a common question-and-answer information sheet or provide a link to a reliable resource with a query service, such as the *Canadian Immunization Guide* (25). If you are able to respond to queries, avoid entering into protracted debates with anyone who has strong anti-vaccination views.

#### **5. Alert social media platform providers to misinformation online**

Work with social media platform providers, not to stifle freedom of expression, but to help ensure that searches do not favour misinformation (26). As an example, Facebook has started removing extreme misinformation websites (27). Consider learning from the techniques being used to help control online hate websites and forums (28).

#### **6. Promote immunization and science literacy curriculum development for use in schools**

Work with departments of education to help develop curricula that can improve students’ understanding of the benefits

and safety of immunization and risks of vaccine-preventable disease. Online games, comics, animation and other forms of visual communication may have more appeal than static pages. While many groups in Canada and elsewhere are developing online immunization educational materials for students (29), it is important to ensure that these fit the context of the audience. For example, the British Columbia Centre for Disease Control education website *Kids Boost Immunity* (30), which is formatted as an interactive quiz, is evidence based, educational and well-liked by students. Evaluations and assessments have shown that children learn about immunization from the site.

A vaccine-specific curriculum is not enough to help increase immunization resiliency. Students also need well-developed critical thinking skills and much higher levels of science and digital literacy if they are to see through the misinformation and con-artist techniques in use on the internet. These skills are needed to assess more than just immunization information, but immunization makes an excellent case. There are resources available to help with this, for example, *Media Smarts* (31).

#### **7. Work with community leaders to build tailored programs in specific communities**

Vaccine uptake may be lower in some communities than in others (32). Listen to and work with communities and with community leaders to build trust in immunization through multipronged campaigns (which may involve online media) that explicitly support local values and are respectful of their context (33,34). Tailored programs can help shift the narrative in the community.

Beyond targeting subgroups, pulling together a collaborative network of national/provincial immunization programs, academia, health professional societies, health centres and health authorities, who add their voices to the positive message of the importance of vaccines and safety, can help sway public attitudes. This is known as the “gateway belief” (35). These common messages also save time and support frontline health professionals’ positive recommendations for immunization.

## **Conclusion**

Misinformation and polarization of online immunization information is not going to go away. For clinical care and public health, the work to increase immunization resiliency is only going to become even more complex. Health care and public health professionals need to better understand why misinformation is so appealing and why polarization is to be expected. People do need to be listened to. Immunization concerns need to be assuaged. Over time, we must become better at discerning what information is credible, be it about health, climate change, the economy or politics. While teaching critical thinking and digital and science literacy is a major step forward, we also need to focus on how better to connect with communities and how to



reframe the immunization messages so they are more effectively heard and better appreciated. Useful accessible materials can be found in the National Advisory Committee on Immunization summary statements (for example, 36), the *Canadian Immunization Guide* (25), the immunization section on the Caring For Kids Website of the Canadian Paediatric Society (37), Immunize Canada (38) and the CANVax website (13).

## Authors' statement

NM — Writing original draft

ED — Writing, review and editing

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